

# Investment and Financing Constraints: Evidence from the Funding of Corporate Pension Plans

JOSHUA D. RAUH

First published: 20 January 2006

<https://doi.org/10.1111/j.1540-6261.2006.00829.x>

Citations: 621

## ABSTRACT

I exploit sharply nonlinear funding rules for defined benefit pension plans in order to identify the dependence of corporate investment on internal financial resources in a large sample. Capital expenditures decline with mandatory contributions to DB pension plans, even when controlling for correlations between the pension funding status itself and the firm's unobserved investment opportunities. The effect is particularly evident among firms that face financing constraints based on observable variables such as credit ratings. Investment also displays strong negative correlations with the part of mandatory contributions resulting solely from unexpected asset market movements.

## REFERENCES

Almeida, Heitor, Murillo Campello, and Michael S. Weisbach, 2004, The cash flow sensitivity of cash, *Journal of Finance* 59, 1777–1804.

[Web of Science®](#) | [Google Scholar](#)

Alti, Aydogan, 2003, How sensitive is investment to cash flow when financing is frictionless? *Journal of Finance* 58, 707–722.

[Web of Science®](#) | [Google Scholar](#)

Angrist, Joshua D., and Alan B. Krueger, 1999, Empirical strategies in labor economics, in Orley Ashenfelter, and David Card, eds.: *Handbook of Labor Economics*, vol. 3a (North-Holland, Amsterdam), 1277–1366.

[Google Scholar](#)

Angrist, Joshua D., and Victor Lavy, 1999, Using Maimonides' Rule to estimate the effect of class size on student achievement, *Quarterly Journal of Economics* 114, 533–575.

[Web of Science®](#) | [Google Scholar](#)

Baker, Malcolm, Jeremy C. Stein, and Jeffrey Wurgler, 2003, When does the market matter? Stock prices and the investment of equity-dependent firms, *Quarterly Journal of Economics* 118, 909–968.

[Web of Science®](#) | [Google Scholar](#)

---

Bergstresser, Daniel, Mihir A. Desai, and Joshua Rauh, 2006, Earnings manipulation, pension assumptions, and managerial investment decisions, *Quarterly Journal of Economics*, forthcoming.

[Google Scholar](#)

---

Blanchard, Olivier J., Florencio Lopez-de-Silanes, and Andrei Shleifer, 1994, What do firms do with cash windfalls? *Journal of Financial Economics* 36, 337–360.

[Web of Science®](#) | [Google Scholar](#)

---

Bodie, Zvi, 1990, The ABO, the PBO, and pension investment policy, *Financial Analysts Journal* 46, 27–34.

[Google Scholar](#)

---

Cleary, Sean, 1999, The relationship between firm investment and financial status, *Journal of Finance* 54, 673–692.

[Web of Science®](#) | [Google Scholar](#)

---

Clifton, Gregory, Steven Oman, Michael Mulvaney, and Tassos Philippakos, 2003, *Analytical Observations Related to U.S. Pension Obligations* (Moody's Investors Service).

[Google Scholar](#)

---

Erickson, Timothy, and Toni M. Whited, 2000, Measurement error and the relationship between investment and Q, *Journal of Political Economy* 108, 1027–1057.

[Web of Science®](#) | [Google Scholar](#)

---

Fama, Eugene F., and Kenneth R. French, 1997, Industry costs of equity, *Journal of Financial Economics* 43, 153–193.

[Web of Science®](#) | [Google Scholar](#)

---

Fama, Eugene F., and James D. MacBeth, 1973, Risk, return and equilibrium: Empirical tests, *Journal of Political Economy* 81, 607–636.

[Web of Science®](#) | [Google Scholar](#)

---

Fazzari, Steven M., Glenn R. Hubbard, and Bruce C. Petersen, 1988, Financing constraints and corporate investment, *Brookings Papers on Economic Activity* 1, 141–195.

[Google Scholar](#)

---

Fazzari, Steven M., Glenn R. Hubbard, and Bruce C. Petersen, 2000, Investment-cash flow sensitivities are useful: A comment on Kaplan-Zingales, *Quarterly Journal of Economics* **115**, 695–705.

[Google Scholar](#)

---

Froot, Kenneth A., David S. Scharfstein, and Jeremy C. Stein, 1993, Risk management: Coordinating corporate investment and financing policies, *Journal of Finance* **48**, 1629–1658.

[Web of Science®](#) | [Google Scholar](#)

---

Gertner, Robert, Eric Powers, and David Scharfstein, 2002, Learning about internal capital markets from corporate spin-offs, *Journal of Finance* **57**, 2479–2506.

[Web of Science®](#) | [Google Scholar](#)

---

Gomes, Joao F., 2001, Financing investment, *American Economic Review* **91**, 1263–1285.

[Web of Science®](#) | [Google Scholar](#)

---

Greenstone, Michael, 2002, The impacts of environmental regulations on industrial activity, *Journal of Political Economy* **110**, 1175–1219.

[Web of Science®](#) | [Google Scholar](#)

---

Greenwald, Bruce, Joseph E. Stiglitz, and Andrew Weiss, 1984, Informational imperfections in the capital market and macroeconomic fluctuations, *American Economic Review* **74**, 194–199.

[Web of Science®](#) | [Google Scholar](#)

---

Gross, David B., 1995, The investment and financing decisions of liquidity constrained firms, Unpublished Ph.D. dissertation, Massachusetts Institute of Technology.

[Google Scholar](#)

---

Grossman, Sanford J., and Oliver D. Hart, 1982, Corporate financial structure and managerial incentives, in John J. McCall, ed.: *The Economics of Information and Uncertainty* (University of Chicago Press, Chicago).

[Web of Science®](#) | [Google Scholar](#)

---

Härdle, Wolfgang, 1990, *Applied Nonparametric Regression* (Cambridge University Press, Cambridge, United Kingdom).

[Google Scholar](#)

Hart, Oliver, and John Moore, 1995, An analysis of the role of hard claims in constraining management, *American Economic Review*, 567–585.

[Google Scholar](#)

---

Hawkins, David F., 2001, *Retiree Benefits*, Harvard Business School Case 9-197-021.

[Google Scholar](#)

---

Hayashi, Fumio, 1982, Tobin's marginal q and average q: A neoclassical interpretation, *Econometrica* 50, 213–224.

[Web of Science®](#) | [Google Scholar](#)

---

Ibbotson Associates, 2003, *Stocks, Bonds, Bills, and Inflation 2003 Yearbook: Market Results for 1926–2002* (Ibbotson Associates, Chicago).

[Google Scholar](#)

---

Internal Revenue Service, 1995, The Retirement Protection Act of 1994, Technical Update 95-1 (Internal Revenue Service).

[Google Scholar](#)

---

Jensen, Michael C., and William H. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* 3, 305–360.

[CAS](#) | [Web of Science®](#) | [Google Scholar](#)

---

Kaplan, Steven N., and Luigi Zingales, 1997, Do investment-cash flow sensitivities provide useful measures of financing constraints? *Quarterly Journal of Economics* 112, 169–215.

[Web of Science®](#) | [Google Scholar](#)

---

Kaplan, Steven N., and Luigi Zingales, 2000, Investment-cash flow sensitivities are not valid measures of financing constraints, *Quarterly Journal of Economics* 115, 707–712.

[Web of Science®](#) | [Google Scholar](#)

---

Lamont, Owen, 1997, Cash flow and investment: Evidence from internal capital markets, *Journal of Finance* 52, 83–109.

[Web of Science®](#) | [Google Scholar](#)

---

Lamont, Owen, Christopher Polk, and Jesús Saá-Requejo, 2001, Financial constraints and stock returns, *Review of Financial Studies* 14, 529–554.

[Web of Science®](#) | [Google Scholar](#)

---

Langbein, John H., and Bruce A. Wolk, 2000, *Pension and Employee Benefit Law*, 3rd ed. (Foundation Press, New York).

[Google Scholar](#)

---

Modigliani, Franco, and Merton H. Miller, 1958, The cost of capital, corporation finance, and the theory of investment, *American Economic Review* **48**, 261–297.

[Web of Science®](#) | [Google Scholar](#)

---

Moyen, Nathalie, 2004, Investment-cash flow sensitivities: Constrained versus unconstrained firms, *Journal of Finance* **59**, 2061–2092.

[Web of Science®](#) | [Google Scholar](#)

---

Munnell, Alicia, and Mauricio Soto, 2003, The outlook for pension contributions and profits, Working Paper, Fifth Annual Conference of the Retirement Research Consortium.

[Google Scholar](#)

---

Myers, Stewart C., and Nicholas S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* **13**, 187–221.

[Google Scholar](#)

---

Pension Benefit Guaranty Corporation, 2003, Cash contribution projections for JCWAA, corporate bond, corporate bond for 3 years, and corporate bond with no DRC for 3 years, Tables prepared for Congressional testimony.

[Google Scholar](#)

---

Perfect, Steven B., and Kenneth W. Wiles, 1994, Alternative constructions of Tobin's q: An empirical comparison, *Journal of Empirical Finance* **1**, 313–341.

[Google Scholar](#)

---

Petersen, Mitchell, 1992, Pension reversions and worker-stockholder wealth transfers, *Journal of Finance* **107**, 1033–1056.

[Web of Science®](#) | [Google Scholar](#)

---

Poterba, James M., 1988, Comment: Financing constraints and corporate investment, *Brookings Papers on Economic Activity* **1**, 200–206.

[Google Scholar](#)

---

Silverman, B. W., 1986, *Density Estimation for Statistics and Data Analysis* (Chapman & Hall, London).

 | [Web of Science®](#) | [Google Scholar](#) |

---

Stulz, Rene, 1990, Managerial discretion and optimal financing policies, *Journal of Financial Economics* 26, 3-27.

 | [Web of Science®](#) | [Google Scholar](#) |

---

van der Klaauw, Wilbert, 1996, Regression-discontinuity evaluation of the effect of financial aid offers on college enrollment, Working paper, New York University Department of Economics.

 | [Google Scholar](#) |

---

Winklevoss, Howard E., 1993, *Pension Mathematics with Numerical Illustrations*, 2nd ed. (Pension Research Council of the Wharton School of the University of Pennsylvania and University of Pennsylvania Press).

 | [Google Scholar](#) |

---

Wooldridge, 2002, *Econometric Analysis of Cross Section and Panel Data* (MIT Press, Cambridge).

 | [Google Scholar](#) |

---

Zion, David, and Bill Carcache, 2002, *The Magic of Pension Accounting* (Credit Suisse First Boston).

 | [Google Scholar](#) |

---

## Citing Literature



[Download PDF](#)

### ABOUT WILEY ONLINE LIBRARY

[Privacy Policy](#)

[Terms of Use](#)

[About Cookies](#)

[Manage Cookies](#)

[Accessibility](#)

[Wiley Research DE&I Statement and Publishing Policies](#)

[Developing World Access](#)

## **HELP & SUPPORT**

[Contact Us](#)  
[Training and Support](#)  
[DMCA & Reporting Piracy](#)

## **OPPORTUNITIES**

[Subscription Agents](#)  
[Advertisers & Corporate Partners](#)

## **CONNECT WITH WILEY**

[The Wiley Network](#)  
[Wiley Press Room](#)

---

Copyright © 1999-2025 John Wiley & Sons, Inc or related companies. All rights reserved, including rights for text and data mining and training of artificial intelligence technologies or similar technologies.

**WILEY**