

The Value and Risk of Defined Contribution Pension Schemes: International Evidence

Edmund Cannon, Ian Tonks

First published: 12 March 2012

<https://doi.org/10.1111/j.1539-6975.2011.01456.x>



ABSTRACT

We use historical data on investment returns and labor income from 16 countries to quantify the value and risk of defined contribution pension plans, building frequency distributions of pension fund and pension replacement ratios for each country. We show that pension risk is substantial and find that pension fund ratios are lower and less variable than when the correlation between wage growth and investment returns is ignored, typically halving the median pension fund ratio. We also show that an all-equity fund is the dominant investment strategy across all countries, although sometimes a life-cycle strategy insures against downside risk.

REFERENCES

Annuaire Statistique de la France: Résumé Rétrospectif, 1966. (Paris: Institut National de la Statistique et des Études Économiques).

[Google Scholar](#)

Antolin, P., C. Pugh, and F. Stewart, 2008, Forms of Benefit Payment at Retirement, OECD Working Papers on Insurance and Private Pensions, No. 26.

[Google Scholar](#)

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. [Privacy Policy](#)

Manage Preferences

Accept All

Reject Non-Essential

Benzoni, L., P. Collin-Dufresne, and R. S. Goldstein, 2007, Portfolio Choice Over the Life-Cycle When the Stock and Labor Markets Are Cointegrated, FRB of Chicago Working Paper No. 2007-11.

[Google Scholar](#) 

Blake, D., A. J. G. Cairns, and K. Dowd, 2001, Pensionmetrics: Stochastic Pension Plan Design and Value-at-Risk During the Accumulation Phase, *Insurance: Mathematics and Economics* , 29(2): 187-215.

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

British Labour Statistics: Historical Abstract 1886-1968, 1971, Department of Employment. London: HMSO.

[Google Scholar](#) 

Burtless, G., 2003, What Do We Know About the Risk of Individual Account Pensions? Evidence From Industrial Countries, *American Economic Review* , 93(2): 354-359.

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

Burtless, G., 2007, International Investment for Retirement Savers: Historical Evidence on Risk and Returns, Center for Retirement Research at Boston College, Working Paper.

[Google Scholar](#) 

Cannon, E., and I. Tonks, 2004, UK Annuity Rates and Pension Replacement Ratios 1957-2002, *Geneva Papers* , 29(3): 371-393.

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

Cannon, E., and I. Tonks, 2008, *Annuity Markets* (Oxford : Oxford University Press).

[Google Scholar](#) 

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. [Privacy Policy](#) 

[Manage Preferences](#)

[Accept All](#)

[Reject Non-Essential](#)

Cocco, J. F., and Lopes, P., 2011, Defined Benefit or Defined Contribution? A Study of Pension Choices, *Journal of Risk and Insurance* , 78(4): 931--960.

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

Diamond, P. A., 1977, A Framework for Social Security Analysis, *Journal of Public Economics* , 8: 275-298.

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

Dilnot, A., and P. Johnson, 1994, *The Taxation of Private Pensions* (London : Institute for Fiscal Studies).

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

Dimson, E., P. Marsh, and M. Staunton, 2002, *Triumph of the Optimists: 101 Years of Global Investment Returns* (Princeton, NJ: Princeton University Press).

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

Disney, R., and C. Emmerson, 2005, Public Pension Reform in the UK: What Effect on the Financial Well Being of Current and Future Pensioners, *Fiscal Studies* , 26(1): 55-82.

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

Doornik, J. A., 2009, *Ox 6: An Object-Oriented Matrix Programming Language* (London : Timberlake Consultants).

[Google Scholar](#)

Economic Policy Committee and the European Commission (DG ECFIN), 2006, The Impact of Ageing on Public Expenditure, *Special Report 1/2006*.

[Google Scholar](#)

Einstein, C. H., 1972, *National Income, Expenditure and Output of the United Kingdom, 1855-1965* (

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. [Privacy Policy](#)

Manage Preferences

Accept All

Reject Non-Essential

Historical Statistics of Canada, 1983-1999, <http://www.statcan.gc.ca/>.

[Google Scholar](#) 

Human Mortality Database. University of California, Berkeley (USA), and Max Planck Institute for Demographic Research (Germany). Available at <http://www.mortality.org> or <http://www.humanmortality.de>. (accessed August, 2008).

[Google Scholar](#) 

International Labour Office, various years, *Yearbook of Labour Statistics* (Geneva: International Labour Office).

[Google Scholar](#) 

James, E., 1997, New Systems for Old Age, World Bank, Working Paper.

[Google Scholar](#) 

MacDonald, B.-J., and A. J. G. Cairns, 2009, Getting Feedback on Defined Contribution Pension Plans, *Journal of Risk and Insurance*, 76: 385-417

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

Maddison, A., *Statistics on World Population, GDP and GDP per Capita, 1-2006 AD*. Available from the Groningen Growth & Development Centre. <http://ggdc.net/maddison/>.

[Google Scholar](#) 

Maddison, A., 2007, *Contours of the World Economy, 1-2030 AD: Essays in Macroeconomic History* (Oxford : Oxford University Press).

[Google Scholar](#) 

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. [Privacy Policy](#)

Manage Preferences

Accept All

Reject Non-Essential

Miles, D., 1999, Modelling the Impact of Demographic Change Upon the Economy, *Economic Journal* , 109: 1-37.

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

Miles, D., and A. Timmerman, 1999, Costing Pension Reform: Risk Sharing and Transition Costs in the Reform of Pension Dystems in Europe, *Economic Policy* , 14(29): 251–286.

[Google Scholar](#) 

Mitchell, B. R., 1988, *British Historical Statistics* (Cambridge, UK: Cambridge University Press).

[Google Scholar](#) 

Mitchell, B. R., 1998, *International Historical Statistics: Europe; The Americas; Africa, Asiana and Oceania; 1750* (Basingstoke : Macmillan).

[Google Scholar](#) 

Office for National Statistics, 2008, Occupational Pension Schemes Annual Report 2007 Edition, No. 15.

[Google Scholar](#) 

Pension Commission, 2004, *Pensions: Challenges and Choices: The First Report of the Pensions Commission* (London: The Stationery Office).

[Google Scholar](#) 

Pension Commission, 2005, *A New Pension Settlement for the Twenty-First Century: The Second Report of the Pensions Commission* (London: The Stationery Office).

[Google Scholar](#) 

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. [Privacy Policy](#) 

[Manage Preferences](#)

[Accept All](#)

[Reject Non-Essential](#)

Poterba, J., J. Rauh, S. Venti, and D. Wise, 2007, Defined Contribution Plans, Defined Benefit Plans, and the Accumulation of Retirement Wealth, *Journal of Public Economics* , 91(10): 2062-2086.

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

Prado, S., 2010, Nominal and Real Wages of Manufacturing Workers, 1860–2007, in: R. Edvinsson, T. Jacobson, and D. Waldenström, eds., *Exchange Rates, Prices, and Wages, 1277–2008* (Sveriges Riksbank). <http://www.w.riksbank.se>

[Google Scholar](#) |

Samwick, A., and J. Skinner, 2004, How Will 401(k) Plans Affect Retirement Income? *American Economic Review* , 94, 329-343.

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

Sandler, R., 2002, Medium and Long-Term Retail Savings in the UK: A Review (London: HM Treasury).

[Google Scholar](#) |

Schooley, D. K., and D. D. Worden, 1999, Investors' Asset Allocations Versus Life-Cycle Funds, *Financial Analysts Journal* , 55(5): 37-43.

[Google Scholar](#) |

Shiller, R. J., 2006, Life-Cycle Personal Accounts Proposal for Social Security: An Evaluation of President Bush's Proposal *Journal of Policy Modeling* , 28: 427-444.

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

Turner, A., 2006, Pensions, Risks and Capital Markets, *Journal of Risk and Insurance* , 73: 559–574.

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

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. [Privacy Policy](#)

[Manage Preferences](#)

[Accept All](#)

[Reject Non-Essential](#)

[Google Scholar](#) 

Yoo, K.-Y., and A. de Serres, 2004, Tax Treatment of Private Pension Savings in OECD Countries and The Net Tax Cost Per Unit of Contribution to Tax-Favoured Schemes, OECD Economics Department Working Papers No. 406.

[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](#)

HELP & SUPPORT

[Contact Us](#)

[Training and Support](#)

[DMCA & Reporting Piracy](#)

[Sitemap](#)

OPPORTUNITIES

[Subscription Agents](#)

[Advertisers & Corporate Partners](#)

CONNECT WITH WILEY

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. [Privacy Policy](#) 

[Manage Preferences](#)

[Accept All](#)

[Reject Non-Essential](#)

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. [Privacy Policy](#)



Manage Preferences

Accept All

Reject Non-Essential