Institution: *London Business School*.

Unit of Assessment: *C19 — Business and Management Studies*.

Title of case study:

Long-Run Global Asset Returns.

1. Summary of the impact

The Dimson-Marsh-Staunton study of long-run global asset returns involved (i) the construction of a unique database of long-run returns on stocks, bonds, bills, inflation, currencies, GDP and population growth for 22 countries since 1900; and (ii) interrogation of this resource to answer contemporary questions in investment, finance, and regulation. It underpins a worldwide reappraisal of the size of the equity risk premium. *The project has informed the strategy of the world's largest investors; influenced cost of capital estimates and real investment decisions in leading corporations; and guided regulation of financial institutions, utilities, and other businesses.*

2. Underpinning research

The research was produced by Elroy Dimson, Paul Marsh and Mike Staunton (DMS). At the time of research and publication, Dimson and Marsh were Professors of Finance at LBS; they are now Emeritus Professors. Staunton was and is Director of the London Share Price Database at LBS.

Previous knowledge about long-run returns was almost exclusively for the USA. The University of Chicago's CRSP database showed that the historical annualised equity premium (the amount by which stocks beat treasury bills) was 6.25% over 1926–99. This became received wisdom in textbooks and business schools worldwide, and it was applied by practitioners as if it were universal. DMS conjectured that the US focus was likely to overstate global investment returns.

The DMS research began with an analysis of long-run UK asset returns (2001, *Journal of Business*). This utilised the comprehensive London Share Price Database (LSPD), created and maintained by LBS, and available to researchers worldwide.

Beyond the important evidence for the UK, there was a need for a more comprehensive global study. DMS painstakingly assembled a multi-country database of asset returns, initially for 16 countries since 1900. Their analysis was published as *Triumph of the Optimists* (2002). The DMS global database has been updated, extended, and analysed intensively; see the *Global Investment Returns Yearbook* and *Sourcebook*. It spans 22 countries, covering 96% of global stock market capitalisation in 1900. It embraces countries where returns were adversely impacted by world wars (Germany, Japan, Austria-Hungary), civil war (Spain), and revolutions (Russia, China).

Some key findings from *Triumph* and related research (referenced below) are that (i) the equity premium has historically been 4.1%, much lower than previously thought; (ii) after adjusting for unrepeatable factors, the prospective premium is lower still at 3–3.5%; (iii) in every country equities outperformed bonds and bonds outperformed bills over the long term; (iv) equity risk does not appreciably decline with longer holding periods; (v) over the long run, purchasing power parity has held to a close approximation, making hedging unnecessary for long horizons; (vi) equities were a poor hedge against inflation, and bonds were the only hedge against deflation; (vii) there is no positive relation between GDP growth and equity returns, and so investor favouritism to fast-growing countries like China is mistaken; and (viii) whereas asset returns may show some weak tendency to mean revert, efforts to take advantage of this are likely to be counterproductive.

3. References to the research

"UK Financial Market Returns," Elroy Dimson and Paul Marsh, *Journal of Business* 74(1), January 2001, pp. 1–31. `dx.doi.org/10.1086/209661`

Triumph of the Optimists: 101 Years of Global Investment Returns, Elroy Dimson, Paul Marsh, and Mike Staunton, *Princeton University Press*, Princeton: New Jersey, 2002. `ISBN: 0-691-09194-3`

Global Investment Returns Yearbook, Elroy Dimson, Paul Marsh, and Mike Staunton, published annually 2000–13. 2013 edition: Credit Suisse Research Institute. `ISBN: 978-3-9523513-8-3`

Global Investment Returns Sourcebook, Elroy Dimson, Paul Marsh, and Mike Staunton, published annually 2009–13. 2013 edition: Credit Suisse Research Institute. `ISBN: 978-3-9523513-9-0`

"Irrational Optimism," Elroy Dimson, Paul Marsh, and Mike Staunton, *Financial Analysts Journal* 60(1), Jan–Feb 2004, pp. 15–25. `ISSN: 0015198X`

"The Equity Premium: A Smaller Puzzle," Elroy Dimson, Paul Marsh, and Mike Staunton, in *Handbook of Investment: Equity Risk Premium*. North-Holland, 2008. `ISBN: 978-0-444-50899-7`

Evidence of quality. The *Journal of Business* was an influential business journal, but ceased publication in 2006 and so is now absent from ranking exercises. The *Financial Analysts Journal* is "3$\star$" rated by the Association of Business Schools. North Holland and Princeton are prestigious academic publishers. All outputs have been cited extensively: 1100+ "google scholar" citations. The DMS studies have been recognised by seven awards for research excellence.

Funding examples. The LSPD was originally funded by a SSRC grant. During the assessment period it was supported by Goldman Sachs, Dimensional Fund Advisors, the London Stock Exchange, and other institutions. *Triumph* received financial support from ABN AMRO. The *Yearbook* and *Sourcebook* updates were supported by ABN AMRO, RBS, and Credit Suisse.

4. Details of the impact

Beneficiaries. The DMS project has impacted asset managers, including pension funds, banks, insurance companies, hedge funds, charities and endowments, and sovereign wealth funds; leading corporations in the UK and overseas; and governments and regulators in many countries.

Impact on asset management. The research has impacted the investments of major funds. It has influenced asset allocation, risk management and diversification, inflation and currency hedging, and market-timing strategies. Early adopters were the Norwegian Government Pension Fund (the world's largest sovereign wealth fund) and PIMCO (the world's largest mutual fund).

Impact on corporations. The discoveries that the historical equity risk premium is lower than previously believed, and that the prospective premium is likely to be even lower, have profound implications for how corporations should estimate their cost of capital. Companies' required rates of return should fall and, other things equal, a larger volume of projects should be deemed profitable. An early adopter was Grosvenor Group, the UK's largest privately owned real estate company.

Impact on regulators. There are many examples of the DMS research strongly impacting regulatory interactions. For example, based on DMS evidence, regulators in many countries, including the UK Financial Conduct Authority (formerly the Financial Services Authority), have reigned in the investment returns that financial product manufacturers and distributors are allowed to project.

The DMS equity premium estimates have influenced rate of return and pricing regulation around the world. Since the DMS estimates indicate a required rate of return on share capital, this has resulted in lower price increases than might otherwise have been permitted, to the benefit of consumers of electricity, gas, telecommunications, water, port fees, railways, and so on. In the UK, all the major regulators including the Office of Water Services, the Office of Communications, the Office of Gas and Electricity Markets, the Civil Aviation Authority, the Office of the Rail Regulator, as well as the Office of Fair Trading and the Competition Commission, have made extensive reference to the DMS research in their submissions on what constitutes a "fair" rate of return.

Impact channels. The research has been channelled to beneficiaries through publications, the internet, presentations, and the media. The publications, including *Triumph*, were written to be accessible to practitioners. Many other publications were specifically written for practitioner outlets, such as the CFA Institute. The *Yearbook* has been distributed in large volumes by the sponsor (currently Credit Suisse) to its corporate, institutional investor, and wealth management clients; it is publicly available as a free download. The DMS dataset is distributed through Morningstar Inc, for the benefit of other researchers, including those in financial institutions.

The DMS team is invited to give many presentations (averaging 35 per year), often as keynotes, at major investment conferences such as the World Investment Forum, the National Association of Pension Funds Investment Conference, the Asia Investment Conference, the CFA Institute Conference, the World Economic and Future Forum, and the Institutional Investor Conference.

The press and media have been important in disseminating and generating awareness of the research. Since the end of 1999, the team's research has been described and cited in some 2,200 press articles in 50 countries (list available on request), while during the assessment period, there have been over 900 press articles covering or referring to the research. These include the Financial Times, the Economist, the Wall Street Journal, the Times, and Money Management.

5. Sources to corroborate the impact

Throughout this section "[link: `xxx`]" indicates the hyperlink "`tinyurl.com/lbs-ref-dms-xxx`"

1. The Norwegian Government Pension Fund explained its investment strategy, explicitly referencing the DMS research: see "103 Years in the Capital Markets" August 2003 [link: `nbim`].

In 2013 Norway's strategy continues to be built on DMS analysis: see "Norway's Government Pension Fund Global: A Large, Long-Term Investor" by Age Bakkerof NBIM, April 2013 [link: `nbim2`].

2. PIMCO, the worlds largest mutual fund, drew early and lasting inspiration from DMS, who were praised in a recent retrospective view: see "A Man in the Mirror," in PIMCO's *Investment Outlook* by PIMCO CEO William H. Gross in April 2013 [link: `pimco-mirror`].

3. The Financial Services Authority commissioned PricewaterhouseCoopers to review the investment returns that financial product manufacturers and distributors were allowed to project. "Rates of Return for FSA Prescribed Projections" (April 2012) heavily used DMS findings [link: `pwc-fsa`].

4. DMS data is important in the assessment of Solvency II capital requirements for the European insurance industry. See "Solvency II Calibration Paper" from the Committee of European Insurance and Occupational Pensions Supervisors in April 2010 [link: `solv2cal`], and "Market Value of Liabilities for Insurance Firms: Implementing Elements for Solvency II" from the Chief Risk Officer Forum in July 2008, [link: `crof`]. Organisations including Friends Provident, use the DMS dataset to assess their equity risk in setting their Solvency II capital requirements.

5. A summary of allowable rates of return in regulated utilities concluded: "... the consultants all draw from benchmark annual studies authored by London Business School's Dimson, Marsh and Staunton and adopt or at least refer to their headline historical risk premium figures." From pp. 1, 7, and 8 of "The Cost of Capital: High Level Review of the Issues," Imrecon, September 2009 [link: `rowson`]. There are 20 more countries in which regulators have extensively cited the DMS research.

6. Internet-available documents reference extensive use of the DMS findings in computing the cost of capital for BT, Bristol Water, BAA, Scottish Power, BSkyB, National Grid, Vodafone, NATS, Dublin Airport, Eircom, Consolidated Edison Company of New York, Boston Gas, Southern California Edison, Pacific Gas and Electricity, Canadian Pacific Railroad, Hydro One (Canada), Senoko Energy (Singapore), Transnet National Ports Authority (South Africa), Eskom (South Africa), Brookfield Rail (Australia), Telstra (Australia), Melbourne Water, Bahrain Telecommunications Company, Powerco (New Zealand), Endesa (Spain), France Telecom, and Telenor (Norway). These can be accessed via [link: `search`] and then adding the company's name to the linked search query.

7. The DMS Global Database is distributed through Morningstar Inc, a provider of independent investment research. 150 organisations from 19 countries have subscribed, including many of the world's largest asset management firms, pension funds, insurance companies, hedge funds, investment banks, private banks and wealth managers, family offices, sovereign wealth funds, investment consultants and actuarial firms, major corporates, leading universities, international organisations, central banks, and regulators. Researchers in financial institutions have used the DMS dataset. For example "A Century of Global Returns," Marlena Lee of Dimensional Fund Advisors [link: `dfa`].

8. Further corroboration on the active use of DMS is from eight named leaders of major institutions, including FTSE international and the London Stock Exchange; the supplement to this case study lists named contacts for this purpose.