

Large-Scale Investment (LSI)

Course Syllabus
Harvard Business School
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Introduction

Although LSI is, at its core, a course about project finance, it should be viewed as an advanced corporate finance course for MBA students. The course analyzes how firms structure, value, and finance large capital investments, where large is defined as costing more than \$1 billion. Most of these investments will be greenfield capital expenditures (not acquisitions, privatizations of existing companies, or investments in intangible assets like R&D) done by for-profit firms. Some examples of these investments are EuroTunnel, EuroDisney, Iridium (global telecommunications), and Chad-Cameroon Pipeline. Given the size of the current market—firms spend approximately \$200 billion annually on large-scale investments—and the need for future investment in both developed and developing countries, there is tremendous potential for value creation or destruction depending on how managers structure and finance these investments.

Career Focus

LSI is intended for students who will be involved at any stage of the investment process from corporate sponsors (as members of the corporate finance or strategic planning departments) to transaction advisors (investment or commercial bankers and management consultants) to investors (people responsible for debt/equity research or money management). Despite the magnitude of these investments, not all participants, somewhat surprisingly, are Fortune 500 firms; small and medium-sized firms often invest in these deals as well. Thus, a desire to work in a small company should not discourage you from taking this course

Educational Objectives

The basic objective of this course is to deepen your understanding of corporate finance while at the same time broadening your understanding of finance by venturing into the world of project finance, emerging markets, and international capital markets.

Essentially, project companies provide a very interesting and very effective setting in which to study core principles of finance and to test where and under what conditions the principles hold. One of the key concepts of the course is the “imperfections framework”: how do market imperfections such as transaction, agency, and financial distress costs affect financing and investment decisions. A second, and related goal of the course is to enhance your ability to create value through investment and financing decisions. Towards that end, the course will analyze how to structure, both contractually and organizationally, investments; how to value projects in general and the equity contributions in particular; how to identify and manage project and sovereign risks; and how to finance projects in terms of both the amount of debt and the types of debt. The ability to understand and discuss these topics requires a solid understanding of the concepts covered in the RC course Finance.

Course Content

The course will be split into four modules: 1) structuring projects (choosing between project and corporate finance); 2) valuing projects; 3) managing project risk; and 4) financing projects. The syllabus includes cases, technical notes, newspaper articles, and readings from practitioner journals. The case protagonists are typically corporate managers from a range of industries including mining, energy, telecommunications, and transportation who are facing a decision in some aspect of the investment process. Most investments are located outside the United States, particularly in developing countries.

Course Requirements

The course consists of 20 sessions plus a paper on a topic of mutual agreement, which can be written individually or in groups of up to three students. Regular class preparation, attendance, and participation are required consistent with the Academic Standards policy.

Course Resources

To assist you in writing the required paper, I have created a Project Finance Portal (www.hbs.edu/projfinportal/), which contains a list of published articles and research on project finance as well as links to more than 1,000 web sites with related information and data. In addition, the required text, Modern Project Finance: A Casebook, contains a glossary of commonly used terms and acronyms.

Required Textbook and Recommended Books:

The required textbook for the course is Modern Project Finance: A Casebook (Wiley, 2004), abbreviated hereafter as *MPF*. In terms of recommended reading, I suggest that you buy either Brealey and Myers' Principles of Corporate Finance (7th edition) or Ross, Westerfield, and Jaffe's Corporate Finance (7th edition) if you do not have a good introductory corporate finance textbook. I may refer to these books as sources for

optional or background readings during the semester. In addition, I recommend the following books if you are particularly interested in reading more about project finance. These books are not required.

1. International Finance Corporation, 1999, Project Finance in Developing Countries, Lessons of Experience number 7, The World Bank Group (Washington, DC).
2. Pollio, G., 1999, International Project Analysis & Financing, University of Michigan Press (Ann Arbor, MI).
3. Finnerty, John D., 1996, Project Finance: Asset-Based Financial Engineering, John Wiley & Sons (New York, NY).
4. Miller, Roger, and Donald R. Lessard, 2000, The Strategic Management of Large Engineering Projects, MIT Press (Cambridge, MA).
5. Khan, M.F.K., and R.J. Parra, 2003, Financing Large Projects: Using Project Finance Techniques and Practices, Pearson Education, Prentice Hall (Essex, UK).
6. Fetherston, Drew, 1997, The Chunnel: The Amazing Story of the Undersea Crossing of the English Channel, Times Books, a division of Random House, Inc., (New York, NY).

Module 1: Introduction/Structuring Projects

Class #1: Tues., January 18, 2005

- Case: Chad-Cameroon Petroleum Development and Pipeline Project (A) (HBS case #202-010, MPF chapter 4)
- Readings: Introduction to *Modern Project Finance* (MPF Chapter 1, also see Introduction to the Large-Scale Investment (LSI) Course at Harvard Business School, HBS case #204-093)
An Overview of Project Finance – 2002 Update (HBS case # 202-105, MPF chapter 2)
- Optional: Why Study Large Projects? (HBS case # 203-031, MPF chapter 3)
- Reference: Project Finance Glossary (HBS case #203-040, MPF Appendix)
Project Finance Research, Data, and Information Sources (HBS case #201-041, MPF Appendix)

Class #2: Thurs., January 20, 2005

- Case: Australia-Japan Cable: Structuring the Project Company (HBS case # 203-029, MPF chapter 5)
- Reading: “Project Financing: An Economic Overview,” by R. Bruner and H. Langhor (Darden School note # 295-026-6)

Class #3: Mon., January 24, 2005

- Case: Calpine Corporation: The Evolution from Project to Corporate Finance (HBS case # 201-098, MPF chapter 6)
- Optional: "Using Project Finance to Fund Infrastructure Investments," by R. Brealey, I. Cooper, and M. Habib, *The Journal of Applied Corporate Finance*, Fall 1996, pp. 25-38.

Class #4: Tues., January 25, 2005

- Case: BP Amoco (A): Policy Statement on the use of Project Finance (HBS case # 201-054, MPF chapter 7)
- Reading: "Rethinking Risk Management," by R. Stulz, *Journal of Applied Corporate Finance*, Fall 1996, 9, 8-24.
- Optional: "A Framework for Risk Management," by K. A. Froot, D. S. Scharfstein, and J. C. Stein, 1994, *Harvard Business Review*, Nov./Dec., pp. 91-102.

Optional Class for Module 1:

- Case: BP Amoco (B): Financing Development of the Caspian Oil Fields (HBS case # 201-067, MPF chapter 8)
- Optional: "Aspects of Financial Contracting in Venture Capital," by W.A. Sahlman, *The Journal of Applied Corporate Finance*, Summer 1988, Vol. 1, No. 2, pp. 23-36.
- Note on Caspian Oil Pipelines (HBS case # 299-044)

Module 2: Valuing Projects

Class #5: Mon., January 31, 2005

- Case: Airbus A3XX: Developing the World's Largest Commercial Jet (A) (HBS case # 201-028, MPF chapter 9)
- Software: Airbus Breakeven Financial Model

Class #6: Tues., February 1, 2005

- Case: Nghe An Tate & Lyle Sugar Company (Vietnam) (HBS case # 202-054, MPF chapter 10)
- Reading: An Economic Framework for Assessing Development Impact, (HBS case #202-052, MPF, chapter 11)
- Software: Nghe An Tate & Lyle Financial Model

Class #7: Mon., February 7, 2005

- Case: Texas High Speed Rail Corporation (HBS case # 293-072, MPF chapter 12)
- Optional: Review Free Cash Flow (WACC) Valuation Methodology

If you need to review the Free Cash Flow (FCF)/Weighted Average Cost of Capital (WACC) valuation methodology, you should read one of the following textbooks:

- 1) Brealey and Myers: Principles of Corporate Finance, (7th ed.), pp. 476-481 and 524-536.
- 2) Higgins, R.C., Analysis for Financial Management, (7th ed.), pp. 278-294.

Class #8: Tues., February 8, 2005

- Case: Southport Minerals, Inc. (HBS case # 274-110)

Class #9: Mon., February 14, 2005

- Lecture: Discount Rates in Emerging Markets
- Readings: "A Practical Approach to Calculating Costs of Equity for Investments in Emerging Markets," by S. Godfrey and R. Espinosa, *The Journal of Applied Corporate Finance*, Fall 1996, pp. 80-89.
- "Expected Returns and Volatility in 135 Countries," by C. Erb, C. Harvey, and T. Viskanta, *The Journal of Portfolio Management*, Spring 1996, pp. 46-58.
- "The Discount Rate in Emerging Markets: A Guide," by Jaime Sabal, *The Journal of Applied Corporate Finance*, Vol. 16, No. 2-3, pp. 155-166.
- Optional: "Valuation in Emerging Markets," by M. James and T. Koller, *The McKinsey Quarterly*, Number 4, 2000, pp. 78-85.
- "A Practical Approach to the International Valuation & Capital Allocation Puzzle," by M. Zenner and E. Akaydin, SalomonSmithBarney, Research Publication, 7/26/02, pp. 1-31.
- Videos: Prof. Campbell Harvey (Fuqua School at Duke University)
- Video # 1: Why the traditional concept of risk as portfolio variance does not apply in emerging markets? (6 minutes)
 - Video # 2: The implications of segmentation and integration of world capital markets. (9 minutes)
 - Video # 3: Alternative approaches to the cost of capital. (11 minutes)
 - Video # 4: The correct discount rate to use for project evaluation in emerging markets. (9 minutes)

Class #10: Tues., February 15, 2005

- Case: Westmoreland Energy, Inc., by R. Menefee and A. Meiman
(Darden School case # UVA-F-1155)
- Reading: "Incorporating Country Risk in the Valuation of Offshore
Projects," by D. Lessard, *The Journal of Applied Corporate
Finance*, Fall 1996, pp. 52-63.
- Optional: Cross-Border Valuation (HBS Note #295-100)

Class #11: Tues., February 22, 2005

- Case: Contractual Innovation in the UK Energy Markets: Enron Europe,
The Eastern Group, and the Sutton Bridge Project, (HBS
case # 201-051, MPF chapter 13)
- Optional: "The Real Power of Real Options," by K. Leslie and M. Michaels,
The McKinsey Quarterly, 1997, No. 3, pp. 4-23.
"The Role of Volatility Value in Power Plant Financing," by D.
White, R. Poats, and M. Borghi, *The Journal of Project
Finance*, Summer 2000, pp. 23-31.
"Merchant Power: Project Finance Criteria" by P. Rigby, *Standard
& Poor's Infrastructure Finance*, October 1999, pp. 24-39.

Optional Class for Module 2:

- Case: Bidding for Antamina (HBS case # 297-054, MPF chapter 14)
- Optional: "A New Approach to Evaluating Natural Resource Investments,"
by Brennan and Schwartz, reprinted in *The New Corporate
Finance*, Donald H. Chew, Jr. (ed.), 1993, pp. 98-107.

Module 3: Managing Project Risks

Class #12: Wed., February 23, 2005

- Case: Petrolera Zuata, Petrozuata C.A. (HBS case # 299-012,
MPF chapter 15)
- Readings: "Defining *force majeure*," by R. J. Fortin, *Project & Trade
Finance*, January 1995, pp. 58-59.
"Rating Approach to Project Finance," by J. Dell et al; *Fitch IBCA,
Duff & Phelps, Project Finance Special Report*," April 26,
2001, pp. 1-12.
- Optional: "Mitigating Major Project Risks," by A. Ahmed, X. Fang, and T.
Rahn, Chapter 4 in *Project Finance in Developing
Countries, No. 7 - Lessons of Experience*, IFC/World Bank,
1999, pp. 38-58.
- Software: Petrozuata Financing and Valuation Model

Class #13: Mon., February 28, 2005

- Case: Poland's A2 Motorway (HBS case # 202-030, MPF chapter 16)
- Readings: "Mitigating Commercial Risks in Project Finance" by J. Ruster, in *PrivateSector*, Note #69, published by The World Bank, February 1996.
- Optional: "Assessing Start-Up Toll Road Construction Risk," by F. Haddad, *Standard & Poor's Infrastructure Finance*, September 1998, pp. 40-45.
- "Traffic Forecasting Risk: Study Update 2003" by Robert Bain and Jan Willem Plantagie, *Standard & Poor's Research Report*, pp. 1-6.

Class #14: Tues., March 1, 2005

- Case: Financing the Mozal Project (HBS case # 200-005, MPF chapter 19)
- Reading: "Is Foreign Infrastructure Investment Still Risky?" by L. Wells and S. Gleason, *Harvard Business Review*, Reprint 95511, September/October 1995, pp. 44-55.
- Optional: "Understanding Sovereign Risk," by W. Chambers, *Standard & Poor's CreditWeek*, January 1, 1997, pp. 1-10.
- "How Preferred Creditor Support Enhances Ratings," by L. Hays, *Standard & Poor's Infrastructure Finance*, October 1999, pp. 46-52.
- "Managing Project Political Risk: The Role of Investment Insurance," by G. West, *The Journal of Project Finance*, Winter 1996, pp. 5-11.
- "Benefits and Limits of Official Sources of Financing in Infrastructure Credits," by Suzanne G. Smith, *Standard & Poor's Sourcebook - Commentary*, September 1998, pp. 81-85.

Optional Class for Module 3:

- Case: Mobile Energy Services Company (HBS case # 203-061, MPF Chapter 17)

Module 4: Financing Projects

Class #15: Mon., March 7, 2005

- Case: Chase's Strategy for Syndicating the Hong Kong Disneyland Loan (A), (HBS case #201-072, MPF chapter 20)
- Reading: "The Role of Commercial Banks in Project Finance," by J. P. Forrester, *The Journal of Project Finance*, Summer 1995, pp. 53-58.
- Handout: Possible Syndicate Structures
- Software: Hong Kong Disneyland Syndication Fee Model

Class # 16: Tues., March 8, 2005

- Case: Restructuring Bulong's Project Debt (HBS case # 203-027, MPF chapter 17)
- Reading: "Moody's Assigns B2 to Senior Secured Project Notes of Bulong Operations PTY LTD" by T. Baker and T. Marshella, pre-sale report by *Moody's Investors Service Global Credit Research*, December 1998, pp. 1-4.
- Optional "Fitch's Rating Approach to Mining Projects," by J. Kunkle and C. Chang, *Fitch IBCA, Duff & Phelps, Project Finance Special Report*, 5/23/02.

Class # 17: Mon., March 21, 2005

- Case: Alba's Pot Line 5 Expansion Project (HBS case #N9-205-027)
- Optional: An Introduction to Islamic Finance (HBS case # 200-002, MPF chapter 22)

Class # 18: Tues., March 22, 2005

- Case: Iridium LLC (HBS case # 200-039, MPF chapter 25)
- Optional: "The Role of the Capital Markets in Project Financings," by P. Simpson and N. Avery, *The Journal of Project Finance*, Spring 1995, pp. 43-48.
- "High-Yield Debt: Broadening the Scope of Project Finance," by P. McKeon, *The Journal of Project Finance*, Fall 1999, pp. 62-69.

Class # 19: Tues., March 29, 2005

- Case: Basel II: Assessing the Default and Loss Characteristics of Project Finance Loans (HBS case # 203-035, MPF chapter 24)
- Optional: "When Projects Fail: 10 Years of Rated Project Finance Debt at Standard & Poor's," by Peter Rigby, Standard & Poor's Credit Research, July 21, 2004.
- "Default Risk in Project Finance," by R. Klompjan and M.J.F. Wouters, *The Journal of Structured and Project Finance*, Fall 2002, pp. 10-21.

Class # 20: Wed., March 30, 2005

- Case: International Rivers Network and the Bujagali Dam Project (A),
(HBS case # 204-083)
- Optional: Excerpts from "The Elusive Quest for Growth: Economists'
Adventures and Misadventures in the Tropics" by William
Easterly, 2001, MIT Press (Cambridge, MA).
Executive Summary of the World Commission on Dams report
(11/16/00).
Epilogue from "Masters of Illusion: The World Bank and the
Poverty of Nations" by Catherine Caufield, 1996, Henry
Holt & Company, Inc. (New York, NY).

Optional Class #1 for Module #4

- Case: Financing PPL Corporation's Growth Strategy (HBS case # 202-045,
MPF Chapter 23)

Optional Class #2 for Module #4

- Case: The International Investor: Islamic Finance and the Equate Project
(HBS case # 200-012, MPF chapter 21)
- Optional: "Layer it On—The Essentials of Rating Project Subordinated Debt,"
by J.W. Kunkle, J.L. Soltz, L. Monnier, and C. Joassin,
FitchRatings Criteria Report, Sept. 9, 2002, pp. 1-7.
"Targeted Risk Capital," by C. Dymond and J. Schoenblum,
Journal of Structured and Project Finance, Vol. 8, No. 2
(Summer 2002), pp. 32-39.

Optional Class #3 for Module #4

- Case: The Equator Principles (being written)

Class # 21: Tues, May 3, 2005

- Lecture/Discussion: Course Wrap-up and Evaluations