The Wharton School – University of Pennsylvania
FNCE 311/811
Infrastructure Financing and Investing

Fall 2018
Preliminary Course Syllabus

(*Please note that this syllabus is subject to change over the duration of the course; however, the general structure and content of the course will remain the same.*)

Professor Kevin Kaiser

Teaching Assistants

Nduka Nwankwo (nnwankwo@wharton.upenn.edu)

Classroom & Time

FNCE 311-001 (Undergraduate) – M/W at 1:30 p.m. – 2:50 p.m. – SH-DH 209
FNCE 811-001 (MBA) – M/W at 3:00 p.m. – 4:20 p.m. – SH-DH 209

Course Description

The world economy runs on the infrastructure which has been built over the past 10,000 years. Each year, this infrastructure requires updating and new additions, from roads and bridges (the original infrastructure), to railroads, airports (the more recent infrastructure), to telecommunications and solar and wind power installations (modern infrastructure). There is a vast amount of public (i.e., taxpayer money directed by government officials) and private (i.e., individuals' money typically managed on their behalf and directed by pension or private equity fund managers or banks into infrastructure investments). In this course, we will cover Infrastructure Financing and Investing from various angles. We will provide descriptions of types of infrastructure, examine the financing needs of infrastructure projects, consider the historic role of government and non-government funding, and assess the changing needs of consumers and role of technology and the increasing demands posed by a globalizing economy. As pension funds and private equity firms increasingly allocate investors' money to infrastructure funds, the need for, and role for, private money in funding infrastructure continues to evolve, so we will also examine infrastructure investing as an alternative asset class from the investors' perspective.

The upfront financing of new infrastructure projects often falls into a category of finance known as "Project Finance" when it involves private investors. Project Finance structures are typically very complex, and involve multiple parties, and are designed to involve these parties in order to align incentives and allocate risks to simultaneously ensure the financing of the project and maximize the likelihood of success of the project (for example, by involving government, banks, and business sponsors all in the financing). The structure is heavily oriented around the complex debt instruments and terms and much effort is focused on managing the risks and minimizing the downside for the debt providers.

The equity and ongoing financing of infrastructure investments are typically referred to as Infrastructure Investing. This is considered to be an *alternative investment class*, sometimes considered to be a subset of Private Equity, in the taxonomy of asset management. This side of infrastructure investing need not occur only at project initiation. At any point during the life of a project, an investor may wish to acquire or dispose of an investment in the infrastructure asset.

As such we can think of Project Financing as the “Venture Capital” or “start-up” stage of Infrastructure Financing and Investing, and Infrastructure Investing as the “Private Equity” stage once the asset is up and running and is now being purchased or sold. In any case, the project management, investment terms, legal rights and obligations, and many other factors will be important to all parties and the terms of the investment will likely address these various angles. As a result, infrastructure investing requires considerable expertise and experience on the parts of the investors as well as the government and other stakeholders.

Delivery of Content

In addition to Professor Kaiser, it is anticipated that various speakers from roles in Private Equity, Asset Management, advisors, and perhaps government or other parties involved in infrastructure investing, will deliver content in this course. While not guaranteed, potential speakers who have expressed keen interest in contributing to the course include:

- Andrew Marino, MD, The Carlyle Group (https://www.linkedin.com/in/andrew-marino-79550415)
- Brent Tasugi, Principal, AMP Capital (https://www.linkedin.com/in/brent-tasugi-0b91477)
- Mr. Pablo Garcia Aguilar is a Chief Financial Officer & Head-Investor Relations at Empresas ICA SAB de CV (https://www.bloomberg.com/profiles/people/19525768-pablo-garcia-aguilar)
- Christopher Mann, Partner, Sullivan & Cromwell LLP (https://www.sullcrom.com/lawyers/ChristopherL-Mann)
- Lars Pace, Principal, Hamilton Lane (https://www.hamiltonlane.com/Staff/Investments/Lars_Pace/)
- Damian Secen, Senior MD, Macquarie Infrastructure and Real Assets (MIRA), Head of M&A (Americas), Head of LatAm Infrastructure, Head of Transport Waste and Communications
- Lex Wolf, MD, Macquarie Infrastructure and Real Assets (https://www.linkedin.com/in/lex-wolf-32476/)
- Perry Offutt, Managing Director, Head of Infrastructure Americas at UBS Asset Management (https://www.linkedin.com/in/perry-offutt-7a395812/)
- Alastair Green, Partner, McKinsey & Co (https://www.linkedin.com/in/alastairwgreen/)
- Alistair Ray, CIO, Partner, co-founder, Dalmore Capital (https://www.dalmorecapital.com/team-members/alistair-ray/)

Topics to be covered are numerous, but focus on Valuing, Financing, and Investing in Infrastructure projects.

- We will consider the methods for assessing the value creation provided by the project itself, and then understand how to allocate that value to the financial providers to maximize the value and minimize the risk. Once up and running we will consider how to identify and value investment opportunities in the infrastructure arena.
- We will delve into the development and role of public-private partnerships (referred to as PPP, 3P or P3) structures.
- We will cover infrastructure investment from various angles including building new infrastructure (referred to as "greenfield" projects), redeveloping existing infrastructure assets (sometimes referred to as "asset recycling" and investing in existing infrastructure as a new acquirer (Infrastructure M&A or brownfield investments). The common thread in the course is the involvement of private money (non-government) investors.
- We will also discuss the development of alternative 'models' and 'regimes' for facilitating private investment in assets previously considered the domain of government funding and management, as well as the necessary policy changes to facilitate ongoing development of private sector involvement in infrastructure assets.
- We will cover different geographies. Much of the recent growth in infrastructure investing originated in Australia where municipalities were early to appreciate the value benefit of PPP arrangements for infrastructure assets and where there has been tremendous growth in the investment opportunities and skillset around infrastructure investing.
- In the Project Finance phase, it is essential to be able to understand the underlying drivers of cash generation and consumption and assess the value and debt capacity of the project to be financed. In this phase of the project, cash flow forecasting is absolutely essential, and this requires a deep understanding of the drivers of value in the project. These drivers need to be modelled in Excel and associated with all sources and uses of cash in order to obtain a forecast of project cash flows.
- Reviewing and revising the core principles of finance to enable an assessment of risk, required return and value. This will take us back to the core principles of finance and the foundational theories of non-diversifiable risk, and Modigliani-Miller capital structure relevance.
- The complications continue when these cash flows need to be allocated to the debt providers, which requires careful and complete understanding of the financing structure and the rights and priorities of the various financial providers. We will cover some of the debt structuring terms and assessment of debt capacity for these projects.
- We then consider Infrastructure Investing as an asset class and as an activity independent of getting an infrastructure project up and running.
- We will cover the role of infrastructure investing to improve portfolio diversification
- Infrastructure investments fall roughly into two categories – those with "utility-like" cash flows which are often sought out by institutional investors with long-term liabilities who wish to hold long-term assets with stable, long-term predictable income, and those more similar to industrial investments undertaken by PE firms where assessment of risks and the importance of operational improvement are key to realizing a good 'alpha' on the investment.

- There always exists the possibility of pricing deviating from value in illiquid investments, and large infrastructure investments may be ripe for such opportunities, providing opportunities for portfolio outperformance. However, identifying such opportunities requires an understanding of both the pricing of these assets and, much more difficult, the valuation of these assets. We will devote lecture time to review the core valuation principles and tools, and these will be applied to value infrastructure investment opportunities in various cases in the course.

The structure of the course includes lectures, case discussions, and guest speakers.

1. Lectures delivered by Professor Kaiser, as well as delivered by industry practitioners, will focus on the underlying principles and concepts of finance in general as well as the principles of Infrastructure Valuation, Financing and Investing.
2. The case exercises are intended to provide participants an opportunity to work in teams and discuss, analyze, and propose their recommendations for resolving the case situation Each group must submit a short (maximum one full page) executive summary of their reflections and commentary for each case. These are required for credit but will not be graded. In addition, each group must submit two "long" reports, maximum 3 pages plus exhibits, for two selected case assignments. Each group is expected to **hand in** a hard-copy of their reports **prior to any class discussion**. Supporting computations and tables can be included in an appendix and submitted in Excel format. All of the inputs and formulas used should be provided (preferably as a footnote). Some of the case assignments contain questions that need to be addressed, however you will also be graded based upon how well you identify the relevant questions and issues to be addressed. Therefore, whether there are questions for the case or not, please consider what the relevant questions are in the context of each case and discuss why and then perform the necessary analysis to address these questions.
3. The guest speakers will offer the personal perspectives of key players in the infrastructure investing arena. Practitioners will bring a variety of real world examples from their own experience, including investing in brownfield and greenfield opportunities, understanding the legal and banking perspectives and relating to the policy changes underway in the USA and elsewhere to facilitate increasing involvement of private sector money in infrastructure investing.

Grades will be based upon individual and team performance assessed as follows:

1. CASE EXERCISES: Long reports for 2 of the case exercises (35% of the final grade, submitted in individually and in teams). Short reports must be submitted for all cases by all teams.
2. GROUP REFLECTION PAPER: and a final "Topical/Reflection Paper" summarizing your team learning from the course and applying those learnings to a self-selected topical issue/event related to Infrastructure Valuation, Financing, and Investing to be presented

to the class (35% of the final grade, submitted in teams).

3. INDIVIDUAL REFLECTION PAPER: an individual paper summarizing your personal insights and learnings gained during this course (10% of final grade).
4. PARTICIPATION: and seminar participation (20% of the final grade)

Note: all written work must be submitted in PDF format and the filename must indicate the Team's number and whether it is a Case, Topical Paper or Reflection Paper. For the Case Exercises, please ensure your submission also indicates (in the filename of the pdf document), whether it is the "long" report or the "short" report in addition to the name of the case.

Course Outline

Class #	Date	Topic	Assignment
15	Monday, October 22, 2018	Intro to Infra Investing	
16	Wednesday, October 24, 2018	Evolution and history of Infra Investing: Australia	Development of the Investing arena
17	Monday, October 29, 2018	Value Principles - Not all infra investing is NPV>0	
18	Wednesday, October 31, 2018	Why Project Finance/Public Private Partnerships?	
19	Monday, November 5, 2018	The PPP structure - key issues	
20	Wednesday, November 7, 2018	Can anyone invest in infra anywhere?	
21	Monday, November 12, 2018	Indiana Toll Road	Brownfield Privatisation
22	Wednesday, November 14, 2018	Thames Tideway Tunnel	Greenfield PPP
23	Monday, November 19, 2018	BTS Skytrain Carveout	IPO of infrastructure asset
	Wednesday, November 21, 2018	Thanksgiving - No class today	no class today
24	Monday, November 26, 2018	Putting it all together - Infra in LatAm/Mexico	
25	Wednesday, November 28, 2018	Reflection & Presentations	
26	Monday, December 3, 2018	Presentations & Reflection	
27	Wednesday, December 5, 2018	Presentations & Reflection	
28	Monday, December 10, 2018	Presentations & Course wrap-up	