Introduction

Since the mid-seventies, the “project approach” to development aid has come under criticism and, four decades later, “project aid” while still a prominent aid modality, is no longer the only, or, for some international development agencies, the preferred, form of development assistance.

This reflects a change in development thinking. Early views (in the 50’s and 60’s) that exclusively focused on the shortage of financial resources for sector investments as the critical constraint for development, have been increasingly broadened, shifting the attention to the policy and institutional context within which investment projects take place. Reflecting such shift, various forms of “program” or “policy-based” assistance, as opposed to specific project financing, have emerged as new aid modalities.

The formulation and selection of investment projects is now increasingly subordinated to the development of sector-wide programs, (in turn framed by medium-term public expenditure frameworks) which are meant to ensure that projects are consistent with good macro and sectoral policies and are financially and institutionally sustainable.

But if planning investment projects is no longer the only, or the main, concern of aid agencies, the task has not gone away or lost its critical importance for aid-recipient governments (central and local) in developing countries. Welfare is improved through investment in change and a substantial part of available resources are invested in projects. Good policies and institutions are critical, but without appropriate investments, the best policies, and most performing institutions, will not deliver sustained economic and social development.

Having lost their absolute prominence as development aid instruments, investment projects remain a key instrument of development administration, and still an important vehicle of international assistance1. In fact enthusiasm for a “program approach” to aid delivery should not obscure the wide array of aid modalities that is often necessary to deploy, as well as the importance of specific investment projects among them.

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1 “Investment lending” that finances projects still represents about two thirds of the World Bank lending portfolio, the remaining third going to “policy-based lending” i.e. different forms of general or sector budget support tied to policy and/or institutional reform.
There is therefore a continuing role for projects as both (a) a way of managing government interventions and (b) a mode of donors’ intervention, where this is made consistent with the objectives of national programs developed and owned by national authorities.

Project planners in governments and aid agencies continue to face the challenge of ensuring the technical quality, the financial sustainability and the economic, social, institutional and environmental viability of development projects.

Course Description

Goals and Scope of the course

The Course aims at providing students with:

1. An introduction to financial and economic analysis of investment operations and its application to the planning and appraisal of international development projects.

2. An opportunity to acquire and practice basic skills for the financial and economic appraisal of selected urban/rural infrastructure and income-generating development projects of moderate scale and complexity.

To these ends, the course will introduce the basic concepts and techniques for integrated appraisal of public and private investment projects, including financial and economic analysis, risk analysis and the assessment of projects’ distributional effects (winners and losers) and impact on poverty reduction goals.

Schedule and Format

The class will meet twice a week (on Fridays and Saturdays) from 8:55am to 12:25pm, for 6 weeks, as per the following calendar.

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Friday 24 October 2014</th>
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<td>Saturday 24 October 2014</td>
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<td>Week 2</td>
<td>Friday 31 October 2014</td>
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<td>Saturday 1 November 2014</td>
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<td>Week 3</td>
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<td>Week 6</td>
<td>Friday 5 December 2014</td>
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<td>Saturday 6 December 2014</td>
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The Friday sessions will include the main lecture; review of the homework assigned the preceding week and class discussion. The Saturday sessions will include a second shorter lecture and in-class Lab work to model and analyze three projects: (i) a rural income-generating project (ii) a transport infrastructure project and (iii) a small urban water supply project. Work on projects (a) and (b) will be done both in class and at home. Work on (c) will be done entirely in class and will help recap the entire content of the course and prepare for the final exam.

Assignments and Final Exam

Students will be required to:
- Carry out two “minor” homework exercises (see list in Detailed Course Schedule).
- Complete the appraisal of two “major” project cases, through a combination of in-class guided work and individual off-class work
- Take a final exam (“take-home”).

The final grade will reflect performance on all the above and will be calculated based on the following weights: Exercises (20%), Major cases (45%) Final Exam (35%)

Reference Handbooks

There is no textbook for this course, but students will be referred to selected sections of:

All reading and reference materials are available on the course site in NYU-CLASSES.

Computer Hardware and Software

During the course, a risk-analysis software package (Crystal Ball) will be used, which runs only on a MS Windows OS (XP, 2000, Vista or Windows 7). Students using machines running a Mac OS, are encouraged to install a Windows OS on their machines.
A free, fully functional, but time-limited version of Crystal Ball will be made available to all course participants. It will also be installed in the TISC LC-19 computer lab machines.
## Course Schedule

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Project Financial Analysis -1</th>
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<tbody>
<tr>
<td>Friday 24 Oct.</td>
<td><strong>Course Presentation</strong> Overview of the objectives, scope and logistic of the course</td>
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</tbody>
</table>
| Lecture 1-A | **PART 1: Projects, Project Cycle and Project Appraisal**  
— projects vs. other policy instruments  
— projects as instruments of development planning and administration  
— projects as modality of development aid  
— project cycle management (PCM)  
— the project planning process  
— dimensions of project appraisal  
— financial and economic appraisal methods (CBA, CEA, CUA)  

**PART 2: Basic Concepts in Project Appraisal**  
— projects as welfare improvements  
— projects as incremental changes  
— incremental costs and opportunity costs  
— incremental benefits, cost savings and avoided costs  

**PART 3: Multiple Points of view in Project Appraisal**  
— Multiple POV in Project Appraisal  
— the POV of the project sponsor/owner (equity holders)  
— The Total Investment (or Banker's) POV  
— The project (Financial Efficiency) POV  
— The project (Economic efficiency) POV  
— Financial vs. Economic Analysis  
— Other POV (The fiscal/budget POV, The domestic economy's POV)  

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<thead>
<tr>
<th>Class discussion</th>
<th>Open discussion</th>
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</table>
| Saturday 25 Oct. | **Lecture 1-B** **PART 1: The "Discounted Cash Flow" (DCF) technique**  
— Project Timeline  
— Typical Project cash flow profiles  
— Discounting and Compounding  
— time units (years/other)  

**PART 2: Construction of Projects Cash Flow Models**  
— Cash Flow by Flow categories |
### Project Appraisal Lab
Understanding different POV in project appraisal. The case of an agricultural diversification project from the point of view of (i) the individual farmers involved (ii) the total project financial efficiency (iii) the domestic economy, and (iv) the Ministry of Agriculture.

### HOMEWORK ASSIGNED

**Assignment #1**
- The concept of opportunity cost
- Multiple Points of View (POV) in project appraisal
- Investment Criteria
- Ranking of alternative projects

### Week 2  Project Financial Analysis - 2

#### Friday 31 Oct.
**Homework Review**
In-class review of previous week lab work and Assignment #1

#### Lecture 2-A
**PART 1: Use of consistent prices in project appraisal**
- Definition of Prices and Price Indices
- Incorporating Inflation in the Financial Analysis
- Impacts of Inflation on Financial Cash flow
- Inflation and rates of exchange
- Inflation and Interest Rates

**PART 2: Financial Cost of Capital**
- Discount Rates in Financial Analysis from different POV
- Required Return on Equity (ROE)
- Weighted Average Cost of Capital (WACC)
- Consistency Check for the Two Financial Points of View

**Class discussion**
Open discussion
<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Topic</th>
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</table>
| Saturday 1 Nov. | Lecture 2-B | **PART 1 - Scale, Timing, and Length of life of a Project**  
|              |           | — Determination of Scale in Project Selection  
|              |           | — Timing of Investments  
|              |           | — Adjusting for length of life in project appraisal  
|              |           | — Projects with Interdependent and Separable Components  
|              | **Project Appraisal Lab** | Appraisal of a Rural Income-generating project: the case of the “Incentives to Women Farmers” (IWF) project from Nicaragua. Presentation of the project logic and distribution of a template for financial and economic analysis. In-class work to complete the financial analysis from the total project point of view.  
|              | **HOMEWORK ASSIGNED** | **Assignment # 2**  
|              |           | — Optimum timing of project start  
|              |           | — Optimum size of project  
| Friday 7 Nov. | **Week 3 Projects Risks Analysis** |  
|              | **Homework Review** | In-class review of Assignment #2 and of the previous week’s lab work  
|              | **Lecture 3-A** | **PART 1: Assessing Project Risks**  
|              |           | — Sensitivity Analysis  
|              |           | — Scenario Analysis  
|              |           | — Monte-Carlo Simulations  
|              |           | **PART 2: Risk Analysis by Monte-Carlo Simulation**  
|              |           | — Building a forecasting model  
|              |           | — Selecting key risk variables  
|              |           | — Running simulations  
|              |           | — Assessing correlation conditions among risk variables  
|              |           | — Analyzing the results of simulations  
|              | **Class discussion** | Open discussion  
| Saturday 8 Nov. | **Lecture 3-B** | **PART 1 : Using Crystal Ball (CB) to select key risk variables**  
|              |           | — developing Tornado Charts  
|              |           | — developing Spider Charts  
|              |           | — Simultaneous assessment of project sensitivity to multiple risk variables  
|              |           | **PART 2: Using CB to build a custom probability distribution from available data**  
|              |           | — Getting and formatting the historical data |
— Identifying trends and disturbances
— Determining range and intervals of the errors frequency distributions
— computing and adjusting the errors probability distributions
— replacing deterministic with probabilistic values in risk variables

**PART 3: Using CB to fit a theoretical probability distribution to available data**
— Getting and formatting available data
— Direct sampling vs. sampling from a fitted distribution
— Using CB to fit theoretical distributions to available data.
— Goodness-of-fit testing: visual inspection of plotted data and CB statistics
— replacing deterministic with probabilistic values in risk variables

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<tr>
<th>Project Appraisal Lab</th>
<th>Continue the appraisal of the “Incentives to Women Farmers” (IWF) project from Nicaragua. Completion of financial analysis from the individual farmers’ point of view and project risk analysis.</th>
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<tr>
<td><strong>Week 4</strong></td>
<td><strong>Projects Economic Analysis - 1</strong></td>
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<tr>
<td>Friday 14 Nov.</td>
<td><strong>Review of Major Case 1</strong> A review of lessons learned from the appraisal of the IWF project (1st Lab case)</td>
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<tr>
<td><strong>Lecture 4-A</strong></td>
<td><strong>PART 1: Microeconomics Foundations of project appraisal</strong></td>
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<td>— Economic vs. Financial Prices</td>
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<td>— Three postulates of welfare economics</td>
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<td>— Economic prices in undistorted markets</td>
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<td>— Economic Prices in distorted markets</td>
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<td>— consumer surplus</td>
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<td>— producer surplus</td>
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<td><strong>PART 2: Economic valuation of Inputs and outputs</strong></td>
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<td>— Traded and non-traded goods</td>
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<td>— Incremental and non-incremental inputs and outputs</td>
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<td>— Valuation of traded inputs and outputs</td>
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<td>— valuation of non-marketed goods</td>
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<td>— The economic opportunity cost of capital (EOCK)</td>
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<td>Date</td>
<td>Class discussion</td>
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<td>Saturday 15 Nov.</td>
<td>Lecture 4-B</td>
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<td><strong>Project Appraisal Lab</strong></td>
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<th>Week 5</th>
<th>Projects Economic Analysis - 2</th>
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<tr>
<td>Friday 21 Nov.</td>
<td>Lecture 5-A</td>
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<td>Saturday 22 Nov.</td>
<td>Project Appraisal Lab</td>
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<td>Week 6</td>
<td>Projects Distributional Analysis</td>
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<td>Friday 5 Dec.</td>
<td><strong>Review of major Case 2</strong> In-class review of previous week lab work</td>
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**Lecture 6-A**

**PART 1: Distribution Analysis**
- Externalities and the project FNPV and ENPV
- Identification of Stakeholders
- Stakeholders sharing the FNPV
- Distribution of ENPV among stakeholders

**PART 2: Poverty Impact**
- Poverty Impact Ratio
- Poverty impact of transport projects
- Poverty impact of water supply projects

**Project Appraisal Lab**
Complete the appraisal of the Toll Bridge over the Mango River (TBMR) project from the economic efficiency and distributional point of view, and carry out the related risk analysis.
- NB: Some questions in the final exam will refer to the appraisal of this project

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<tr>
<th>Saturday 6 Dec.</th>
<th><strong>Lecture 6-B</strong></th>
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<tr>
<td><strong>COURSE RECAP</strong></td>
<td>In-class presentation and appraisal of a small-scale Water Supply project, serving as a comprehensive recap of concepts and techniques covered in the course.</td>
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<td>— NB: Some questions in the final exam will refer to the appraisal of this project</td>
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**FINAL EXAM ASSIGNED**
An individual Take-Home Final Exam is assigned. Deadline for submissions is midnight of Monday 22 Dec. 2014

**Please e-mail to the Instructor at Leonardo.romeo@nyu.edu**