Project Financing for Major Infrastructure Projects

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Introduction
Main investment sectors within infrastructure

**Economic Infrastructure**

**Utilities** (Power generation, Electricity, Gas, Water and Telecoms)
Of the USD 44 trillion in investment in energy supply from 2016-40, fossil fuels investment will fall by 60% and investments in renewable energy has been increasing. In 2016, 42% of infrastructure deals are renewable energy deals.

**Extraction** (Oil and Gas)
Between now and 2025, extraction sector is expected to grow at annual rate of 5% and its market share of infrastructure will slip back to 14% (17% in 2013).

**Manufacturing** (Petroleum refining, Chemicals and Heavy Metal)
The manufacturing sector will grow at an annual rate of 8% by 2025 and it will represent 21.3% of global infrastructure spending. The largest deal completed in 2016 was to finance the construction of the Tuban Refinery Plant.

**Transport** (Railway, Road, Airport and Port)
Cities are expected to hold 5.2 billion residents by 2050. Over the next 20 years, more cars may be built than in the auto industry’s 110-year history, and an estimated one billion people in low-income countries still lack access to an all-weather road.

**Social Infrastructure**

**Social Infra** (Hospital and School)
Aging population in Western Europe and Asia will necessitate more healthcare facilities, while growing populations in developing countries will require more schools for the youth.

The Three Fundamental Forms of Lending

- All lending relies primarily on cashflows for repayment
- Most lending involves taking security over physical assets
- Lending always remains a corporate obligation

Different approaches, but interlinked
Why use Project Finance?

- Where project = company i.e. single purpose vehicle
- Where project is large relative to company hence make sense to ring fence risk associated with project
- Cheap political risk insurance and export credits to enhance credit worthiness of project company
- To provide an additional discipline on investment appraisal in particular because robustness of project cashflow is the key to raising financing
# Sectors Suitable for Project Finance

<table>
<thead>
<tr>
<th>Water</th>
<th>Power &amp; Energy</th>
<th>Transport</th>
<th>Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water treatment</td>
<td>IPPs/PPA projects</td>
<td>Light rail</td>
<td>Low income</td>
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<tr>
<td>Waste water</td>
<td>Merchant plants</td>
<td>Roads</td>
<td>Affordable</td>
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<tr>
<td>Desalination</td>
<td>Inside the fence</td>
<td>Bridges</td>
<td>Defence accommodations</td>
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<tr>
<td>Inside the fence</td>
<td>District heating</td>
<td>Rail</td>
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<tr>
<td></td>
<td>Oil &amp; Gas</td>
<td>Airports</td>
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<td>Ports</td>
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<tr>
<th>Healthcare</th>
<th>Education</th>
<th>Prison</th>
<th>Other Sectors</th>
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<tbody>
<tr>
<td>New facilities</td>
<td>New facilities</td>
<td>New facilities</td>
<td>Sports Infrastructure</td>
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<tr>
<td>Refurbishment</td>
<td>Refurbishment</td>
<td>Refurbishment</td>
<td>Properties and Real Estate</td>
</tr>
<tr>
<td>Facilities management</td>
<td>Facilities management</td>
<td>Facilities management</td>
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Project Finance
What is Project Finance? - Definition

Where lenders can look solely to the cashflow generated by the project for repayment

and

The assumptions used to forecast the cashflow can be independently verified

so that

Risk analysis can demonstrate that there is a very high probability of repayment (> 95%)
# Project finance and corporate finance

<table>
<thead>
<tr>
<th>Project Financing</th>
<th>Corporate Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lenders rely on cash flows of the project for repayment</td>
<td>1. Lenders have access to cash flow from borrowers’ various businesses</td>
</tr>
<tr>
<td>2. Project assets and/or contracts (e.g. concession agreement) as collateral</td>
<td>2. Parent company’s assets as collateral</td>
</tr>
<tr>
<td>3. Non-recourse or limited recourse</td>
<td>3. Recourse</td>
</tr>
<tr>
<td>4. Risk-fencing of risk for sponsors</td>
<td>4. Parent company/investors may be exposed to repayment risks</td>
</tr>
<tr>
<td>5. Off balance sheet treatment</td>
<td>5. On balance sheet treatment</td>
</tr>
<tr>
<td>6. High debt to equity ratio, typically around 70%-90% of capital expenditure</td>
<td>6. Moderate debt to equity ratio</td>
</tr>
<tr>
<td>7. Project has a finite life, hence debt must be fully repaid by the end of project life</td>
<td>7. Assume company will remain in business for an indefinite period, hence debt can be rolled over</td>
</tr>
</tbody>
</table>
Typical Project Structure

- Lender
  - Loan and Security Agreements
  - Equity

- Sponsor
  - Financing
  - Special Purpose Vehicle
    - Offtake Agreement
    - Offtaker

- Land Owner
- EPC Contractor
- Utility
- Operator
- Other Suppliers

- Other Equity Participants
- EPC Contractor
- Power Purchase Agreement
- Operation and Maintenance Contract
- Other Supply Contracts
Lenders Term Sheets

What’s included in a term sheet?

When a Lender provides a Term Sheet to a borrower for a project, it will cover the following main areas:

<table>
<thead>
<tr>
<th>The Project</th>
<th>Parties and Project Agreements</th>
<th>Facilities</th>
<th>General</th>
</tr>
</thead>
</table>
| • Project information  
• Term of Contract  
• Key dates  
• Project costs  
• Gearing  
• Project financing | • The Authority and Borrower  
• Project Shareholders  
• Key Contractors  
• Underwriters, Agents and Security Trustee  
• Project Agreements  
• Offtake Agreements  
• EPC and O&M Contracts  
• Lease Agreement(s)  
• Financing Agreements | • Project facilities and tenor  
• Facility purposes  
• Availability period  
• Interest rates and margins  
• Interest period  
• Underwriting commitment  
• Upfront & commitment fees  
• Drawdown  
• Facility recourse  
• Available cashflow  
• Actual expenditure  
• Payment cascade  
• Debt service  
• Interest payment | • Grace period  
• Principle repayments  
• Cancellation  
• Prepayments  
• Equity distribution  
• Default events  
• Annual Debt Service Cover Ratio  
• Covenants  
• Security  
• CPs to first & subsequent drawdowns  
• Interest rate swaps |
| • Governing Law  
• Default events  
• Material adverse effect  
• Insurance policies |
It Is Cashflow Based & Sculpted

Base case: Project IRR 20%

Real debt interest rate = 6% pa
It Can Absorb Risk

25% cost overrun; Oil Price falls from 20$ to 15$; Project IRR 10%
Key terms in Project Finance
Key Terms in Project Finance

• Cash Available for Debt Service;
• Debt Service Cover Ratio;
• Reserve Accounts;
• Loan Life Cover Ratio;
• Debt Sculpting; and
• Cash Sweep.
Key Ratios - Context

- ADSCR
- Net Cashflow
- Debt Service
- LLCR

Organised by

Institute of Singapore Chartered Accountants
Cash Available for Debt Service (CFADS)

- CFADS is calculated by netting out revenue, operating expenditure (Opex), capital expenditure (Capex), debt & equity funding, tax and working capital adjustments;

- CFADS is preferred to determine gearing and lending capacity as opposed to EBITDA since this measure does not take taxes and timing of cash flows into considerations; and

- When modelling with different seniority of loans, it is important to include cash flow available at the appropriate level of seniority.
Debt Service Cover Ratio (DSCR)

DSCR is defined as the amount of cash flow available to meet scheduled interest and principal repayment on debt.

Debt Service Cover Ratio = Cash flow available for Debt Service / Debt Service (Principal + Interest)

The illustration shows the proportions of Cash flow Available for Debt Service compared to Total Debt Service (Interest + Principal); and

With CFADS significantly larger than Debt Service, there is a significant buffer in the project to protect the lenders from decreased cash flows from the project due to, for example, operation inefficiencies post end of construction.

Source: Navigator Project Finance
Debt Service Cover Ratio (DSCR)

- A DSCR of <1 means that the cash flows from the project are not strong enough to support the level of debt;
- Typical DSCR is set above 1; and
- DSCR is calculated at every repayment.

Example: Minimum DSCR is 1.30x.
There is a weak cash flow in the last period (December 2012) of the project where the DSCR drops below the Term Sheet DSCR Covenant of 1.30x.

Source: Navigator Project Finance
# Reserve Accounts

<table>
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<tr>
<th>Reserve Account</th>
<th>Description</th>
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</table>
| Debt Service Reserve Account (DSRA) | • Works as an additional security measure for the lender as it ensures that the borrower will always have funds deposited for the next x months of debt service;  
• Commonly is 6 or 12 months of debt service. |
| Major Maintenance Reserve Account (MMRA) | • Ensure cash is effectively put aside equal to the estimated major maintenance lifestyle costs in the year in which such costs are to be incurred;  
• Is required when lifecycle expenditure is lumpy and/or where the major maintenance cycle of the project is such that there are large major maintenance costs relative to the cash flow which is incurred during the operational life of the project;  
• Usually funded to certain target balance, which can be set at 6, 12, 18 or 24 months of future major maintenance expenditure; and  
• Interest is usually earned on the opening balance. |
Loan Life Cover Ratio (LLCR)

• LLCR is defined as the number of times the cash flow over the scheduled life of the loan can repay the outstanding debt balance.

\[
\text{Loan Life Cover Ratio} = \frac{\text{NPV (Cash flow Available for Debt Service over Loan Life)}}{\text{Debt Balance b/f}}
\]

• When DSRA is included, LLCR shall be calculated as follows:

\[
\text{Loan Life Cover Ratio} = \frac{\text{NPV (Cash flow Available for Debt Service over Loan Life + DSRA b/f)}}{\text{Debt Balance b/f}}
\]

• The Discount Rate used in the NPV calculation is usually the Cost of Debt, also known as the Weighted Average Cost of Debt;

• An LLCR of 1.00x means that the CFADS, on a discounted basis, is exactly equal to the amount of the outstanding debt balance; and

• As LLCR is a discounted average, it does not pick up weak periods. If the project has steady cash flows with credit foncier* repayment, a common rule of thumb is that the LLCR should be roughly equal to the average DSCR.

• * A type of loan structured with regular usually monthly, repayments which incorporate principal and interest.

• Most mortgages operate this way.
Debt Sculpting

- Debt sculpting means that the principal repayment obligations have been calculated to ensure that the principal and interest obligations are appropriately matched to the strength and pattern of the cash flows in each period;
- This ensures that the DSCRs are less volatile than may otherwise be the case;
- Sculpting can be calculated by algebraically solving the principal repayment to achieve a desired DSCR.

Principal = Cash Available for Debt Service / DSCR (Target) - Interest

- Sculpting is required in the following situations:
  - Irregular, but well understood cash flows
  - Seasonal demand factors (common in power, agriculture, manufacturing industries)
  - The ramp-up period of a new project, such as a toll road
  - An unusual but expected payment, such as a major overhaul of an asset.
Debt Sculpting

- Graphs are often useful during the debt sculpting process as a checking tool.
- The graph (left) clearly demonstrates that the project has irregular cash flow, thus the sculpted debt repayment needs to be matched to the pattern of the cash flow in each period.
Cash Sweep

- Cash Sweep is the use of surplus cash to prepay debt or provide extra security for lenders, instead of paying it out to investors;
- Surplus cash is not distributed to investors and is instead used to repay principal and interest;
- The cash flow used for a stand alone cash sweep is CFADS – Interest Payable on the cash sweep debt balance – Cash Available for Principal; and
- Cash sweep is useful in dealing with lenders who are concerned with tail risk or refinance risks.
Analysing Risk - Lenders’ Perspective

Loan Life Cover Ratio
Or Debt Service Cover Ratio

Base Case = 1.5

Requires action

Sensitivities
Alternative forms of Project Financing
Green Bonds (and other forms of bond financing)

The Green Bond Principles do not provide details on “green”. The green definitions are left to the issuer to determine. Broad categories suggested by the principles include:

- Renewable energy
- Energy efficiency (including efficient buildings)
- Sustainable waste management
- Sustainable land use (including sustainable forestry and agriculture)
- Biodiversity conservation
- Clean transportation
- Clean water and/or drinking water
With some of the largest issuances being announced...

5 March 2018

Nigeria plans to go big on green bonds this year

The Nigerian Government has spoken of its plans to seriously scale up its green finance initiatives over the coming year. This includes issuing green bonds worth $150 billion naira ($415 million) to help fund a range of sustainable and climate-sensitive projects.

Speaking at a conference in Lagos, Ahmad Salihijo, an adviser at the Ministry of Environment, commented: “Everybody is excited about the idea of climate funding, everybody wants to be a part of it. Highly reputable organizations within and internationally are supporting us.”

Hong Kong announces world’s largest sovereign green bonds programme

Indonesia set to join green bond club

Coal exporter taps investor demand for debt tied to environmental projects

Emma Dunkley in Hong Kong and Kate Allen in London FEBRUARY 23, 2018

Indonesia, the world’s biggest exporter of coal used to generate power, is set to fast-growing market.

Belgium joins green bond club with EUR-4.5bn sale

February 27 (Renewables Now) - Belgium has issued its first sovereign green bond worth EUR 4.5 billion (USD 5.5bn) that will help it finance environmental and clean energy initiatives, the country’s Debt Agency said on Monday.

The bonds mature in 15 years (April 22, 2033) and carry a coupon of 1.25%.

Barclays, BNP Paribas Fortis, Credit Agricole, ING Groep NV and JPMorgan Chase & Co were hired as joint bookrunning managers of the transaction.

Initially, Belgium hoped to raise between EUR 3 billion and EUR 5 billion.
Blended finance is the mobilisation of additional commercial finance for developing countries

*Private investors: the missing piece of the puzzle*

- In February 2016, The OECD Development Assistance Committee (DAC) agreed to develop ‘an inclusive, targeted, results-oriented work programme’ on blended finance.
- The following mechanisms will provide recommendations to bring together public and private investors for the use and deployment of blended finance to achieve the SDGs.

**Evidence based:** Collate evidence and lessons learned on blended finance with a focus on targeting private finance and the use of blended finance across different regions.

**Best practices:** Develop best practices for deploying blended finance in key economic systems and sectors, such as sustainable infrastructure, and to address specific issues such as climate change.

**Policy guidance:** Deliver policy guidance and principles on the use of blended finance to deliver development impact.
Municipal bonds gaining momentum as a feasible tool to finance urban infrastructure project

- **Tapping into the market via the issuance of municipal bonds**

  - For countries experiencing rapid urban expansion, the largely untapped municipal bond market becomes a significant source of financial capital.
  
  - In principle, SOEs should raise capital from the market to propel their growth however, there are too much risks associated to municipal bonds.
  
  - To attract individual and institutional investors, local governments can promote municipal bond market which largely depends on the government’s ability to pay their obligations with a good financial track record.
  
  - There is also the option of a revenue bond where SPVs which operate independently can control specific revenue streams which can serve as collateral for private investment

**Key Benefits:**

- ✓ Raise competition among SOEs and SPVs in order to access capital
- ✓ Incentivise market discipline for meeting long term objectives for project delivery and sustainable funding
- ✓ Serve as a market signal for the performance and capabilities of SOEs and SPVs to execute and complete projects
- ✓ More private capital would be directed to higher performing SOEs
Key considerations for municipal finance

<table>
<thead>
<tr>
<th>Revenue streams/Ability to pay</th>
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</thead>
<tbody>
<tr>
<td>• In principle, any revenue stream or asset works</td>
</tr>
<tr>
<td>• In practise, revenue streams municipality can control work best (Taxes; Fees and charges; Capital revenue)</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Pledges, liens, hypothecation, etc.</th>
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<tr>
<td>• Legal frameworks include General law on how debt can be secured; Law regarding security a municipality can give; and Law regarding lender’s remedies against municipality</td>
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<tr>
<th>Credit enhancements</th>
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<tbody>
<tr>
<td>• Guarantees, insurance, letters of credit; reserve funds; sinking funds; covenants; others</td>
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</tbody>
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<tr>
<th>Structuring debt services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Size matters</td>
</tr>
<tr>
<td>• Shape matters – bullet; level principal; level payments (annuity)</td>
</tr>
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</table>
Arguably a greater rate of structural change than at any time in history

Is infrastructure a low risk asset class if investments are based on a 25 year model?

Mega Projects – Belt & Road

Alternative finance models
Thank You!

For more info: pwc.com/infratrends2017

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