Income Approach

DELOS Damages & Valuation MOOC: Introductory Module 1.6

Julian M. Delamer, Alan G. Rozenberg, Miguel A. Nakhle

CONTENTS

Overview of the Income Approach

INCOME APPROACH TO VALUATION

"[T]he price paid for any asset should reflect the cashflows that it is expected to generate."

— Prof. Damodaran (2002)

INCOME APPROACH: DCF METHOD (I)

The most common implementation of the income approach is the Discounted Cash Flow (DCF) Method

Primary Tool that Corporations Use for Firm Valuation

Exhibit 2. General Survey Results

	Corporations	Financial Advisers	Textbooks/Tradebooks
1. Do you use DCF techniques to evaluate investment opportunities?	89%—Yes, as a primary tool. 7%—Yes, only as secondary tool. 4%—No	100%—Rely on DCF, comparable companies multiples, comparable transactions multiples. Of these, 10%—DCF is a primary tool. 10%—DCF is used mainly as a check. 80%—Weight the three approaches depending on purpose and type of analysis.	100%—Yes

Source: Bruner et al. 1998. "Best Practices in Estimating the Cost of Capital: Survey and Synthesis." Journal of Financial Practice and Education, Vol. 8.

Recommended by Leading Corporate Financial Scholars (Copeland et. al)

"We believe that the manager who is interested in maximizing share value should use discounted cash flow (DCF) analysis, not earnings per share, to make decisions. The DCF approach captures all the elements that affect the value of the company in a comprehensive yet straightforward manner. Furthermore, the DCF approach is strongly supported by research into how the stock markets actually value companies."

Source: Copeland, et al. 1994. Valuation: Measuring and Managing the Value of Companies, 2nd ed. New York: John Wiley & Sons, Chapter 3, p. 70

INCOME APPROACH: DCF METHOD (II)

The most common implementation of the income approach is the Discounted Cash Flow (DCF) Method

Commonly used in International Arbitration proceedings

"[…] **one of the most commonly** used tools to measure the value (as well as loss of value) of a business is discounted cash flow (DCF), that is to say, the present value of the expected cash flows that the business will generate in the future."

Source: GAR. The Guide to Damages in International Arbitration, Second Edition. London: Law Business Research Ltd, Chapter 5, p. 81.

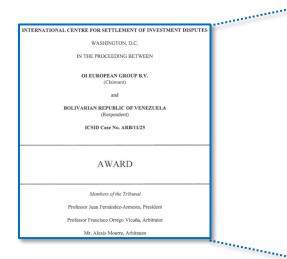## Main valuation method for going concerns per the World Bank Guidelines

6. Without implying the exclusive validity of a single standard for the fairness by which compensation is to be determined and as an illustration of the reasonable determination by a State of the market value *of* the investment under Section 5 above, such determination will be deemed reasonable if conducted as follows:

    (i) for a going concern with a proven record of profitability, on the basis *of* the discounted cash flow value;

    -a "*going concern*" means an enterprise consisting of income-producing assets which has been in operation for a sufficient period of time to generate the data required for the calculation of future income and which could have been expected with reasonable certainty, if the taking had not occurred, to continue producing legitimate income over the course of its economic life in the general circumstances following the taking by the State;

Source: World Bank's Guidelines of the Treatment of Foreign Investment (1992).

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USE OF THE DCF METHOD IN ARBITRATION CASES (I)

The DCF method is widely used in international arbitration …

INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES

WASHINGTON, D.C.

IN THE PROCEEDING BETWEEN

OI EUROPEAN GROUP B.V.
(Claimant)

and

BOLIVARIAN REPUBLIC OF VENEZUELA
(Respondent)

ICSID Case No. ARB/11/25

AWARD

Members of the Tribunal
Professor Juan Fernández-Armesto, President
Professor Francisco Orrego Vicuña, Arbitrator
Mr. Alexis Mourre, Arbitrator

OI European Group BV v. Venezuela (ICSID Case No. ARB/11/25)

The most widely accepted formula for calculating the market value of a functioning company is unquestionably the DCF methodology—provided that the enterprise can show that it will generate a reasonably foreseeable free cash flow in the coming years. This methodology essentially means the following (using the World Bank's definition):[718]

"'[D]iscounted cash flow value' means the cash receipts realistically expected from the enterprise in each future year of its economic life as reasonably projected minus that year's expected cash expenditure, after discounting this net cash flow for each year by a factor which reflects the time value of money, expected inflation, and the risk associated with such cash flow under realistic circumstances. Such discount rate may be measured by examining the rate of return available in the same market on alternative investments of comparable risk on the basis of their present value."

International Centre for Settlement of Investment Disputes

Quiborax S.A.
and
Non Metallic Minerals S.A.
Claimants

v.

Plurinational State of Bolivia
Respondent

ICSID Case No. ARB/06/2

AWARD

Rendered by an Arbitral Tribunal composed of:
Prof. Gabrielle Kaufmann-Kohler, President
Hon. Marc Lalonde, P.C., O.C., Q.C., Arbitrator
Prof. Brigitte Stern, Arbitrator

Quiborax S.A., et al v. Bolivia (ICSID Case No. ARB/06/2)

In the Tribunal's view, NMM's mining activity has a sufficient record of operations and prospective profitability to justify applying the DCF method to value the concessions. As discussed in detail below, there is sufficient evidence in the record to make a projection of the future cash flows that would have been generated by the concessions with reasonable certainty. In particular, there is sufficient evidence of the reserves found in the concessions, prospective future sales (arising from the Supply Contract between Quiborax and RIGSSA in 2001[392]) and sufficient information on prospective prices and costs to justify valuing the concessions on the basis of the DCF method.

USE OF THE DCF METHOD IN ARBITRATION CASES (II)

… although not in every case

INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES

Bear Creek Mining Corporation

v.

Republic of Perú

(ICSID Case No. ARB/14/21)

AWARD

Members of the Tribunal
Prof. Karl-Heinz Böckstiegel, President of the Tribunal
Dr. Michael Pryles, Arbitrator
Prof. Philippe Sands QC, Arbitrator

Secretary of the Tribunal
Ms. Mercedes Cordido-Freytes de Kurowski

Assistant to the Tribunal
Dr. Katherine Simpson

Bear Creek Mining Corporation v. Peru (ICSID Case No. ARB/14/21)

> In view of the above considerations, the Tribunal concludes that the calculation of Claimant's damages in the present case cannot be carried out by reference to the potential expected profitability of the Santa Ana Project and the DCF method. The Project remained too speculative and uncertain to allow such a method to be utilized. Instead, the Tribunal concludes that the measure of damages should be made by reference to the amounts actually invested by Claimant.

METALCLAD CORPORATION
Claimant

and

THE UNITED MEXICAN STATES
Respondent

A W A R D

Before the Arbitral Tribunal constituted under Chapter Eleven of the North American Free Trade Agreement, and comprised of:

Professor Sir Elihu Lauterpacht, QC, CBE President
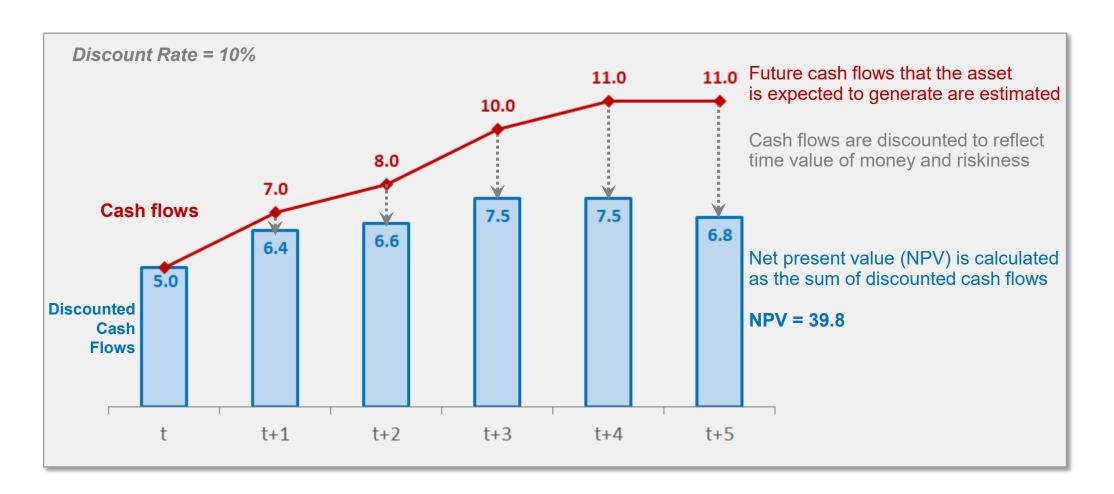Mr Benjamin R. Civiletti
Mr José Luis Siqueiros

Metalclad Corporation v. Mexico (ICSID Case No. ARB(AF)/97/1)

> 121. The Tribunal agrees with Mexico that a discounted cash flow analysis is inappropriate in the present case because the landfill was never operative and any award based on future profits would be wholly speculative.

MECHANICS OF THE DCF METHOD

Under the DCF methodology an asset's price is equal to the net present value of its future cash flows

Discount Rate = 10%

Cash flows

Discounted Cash Flows

	t	t+1	t+2	t+3	t+4	t+5
Cash flows	5.0	7.0	8.0	10.0	11.0	11.0
Discounted Cash Flows	5.0	6.4	6.6	7.5	7.5	6.8

Future cash flows that the asset is expected to generate are estimated

Cash flows are discounted to reflect time value of money and riskiness

Net present value (NPV) is calculated as the sum of discounted cash flows

NPV = 39.8

VARIANTS OF THE DCF METHOD

Two frequently used approaches are the FCFF and FCFE methodologies

Cash Flow Calculation

Revenues
- – *Operating Expenses (OPEX)*
- – *Income Tax*
- – *Capital Expenditure (CAPEX)*
- – *Change in Working Capital*

= Free Cash Flow to the Firm (FCFF) ← **Enterprise Valuation**
Discount Rate = Weighted Average Cost of Capital (**WACC**)

- – *Debt Repayments (Debt Issuance)*
- – *Interest Payments (Net of Income Tax)*

= Free Cash Flow to Equity (FCFE) ← **Equity Valuation**
Discount Rate = Cost of Equity (**CoE**)

ROBUSTNESS CHECKS

1. Sensitivity Analysis

Enterprise Value (US$ MM)

		Perpetuity Growth Rate				
		4.00%	4.50%	5.00%	5.50%	6.00%
WACC	11.3%	53.50	56.60	60.10	64.30	69.30
	11.8%	50.00	52.70	55.70	59.20	63.30
	12.3%	47.00	49.30	51.90	54.90	58.30
	12.8%	44.30	46.30	48.60	51.10	54.10
	13.4%	41.90	43.70	45.60	47.80	50.40

2. Scenario Analysis

OPTIMISTIC CASE
- Volumes (+5%)
- Prices (+5%)
- OPEX (-5%)

US$ 55 MM

BASE CASE
- Volumes (+/- 0%)
- Prices (+/- 0%)
- OPEX (+/- 0%)

US$ 51.9 MM

PESSIMISTIC CASE
- Volumes (-20%)
- Prices (-20%)
- OPEX (+20%)

US$ 10 MM

Probability: 10% 50% 40%

Average NPV
US$ 39.0 MM

Probability-weighted NPV
US$ 35.5 MM

3. Cross Check with other Methods

EV/EBITDA Multiple — Month 1 through Month 24 — *Median* — Implicit Multiple from DCF

Relative Valuation
1. Transaction Multiples
2. Trading Multiples

- ✓ EV/EBITDA
- ✓ Price/Earnings
- ✓ Price/Book Value
- ✓ Can also use operational metric

Forecasting Cash Flows

COMMON METRICS OF CASHFLOWS

Estimating Free Cash Flows – do not confuse with "profits" or "net income"

1

Revenue

(-) Operating Expense (OPEX)

Earnings before interest, taxes, depreciation, and amortization (EBITDA)

(-) Depreciation & Amortization

Earnings before interest and taxes (EBIT)

2

(-) Income Tax
(-) Capital Expenditure (CAPEX)
(+) Depreciation & Amortization
(-) Change in Working Capital

Free Cash Flow to the Firm (FCFF)

> Measures the cash generated for all stakeholders (both debt and equity), after accounting for operating and investing expenses
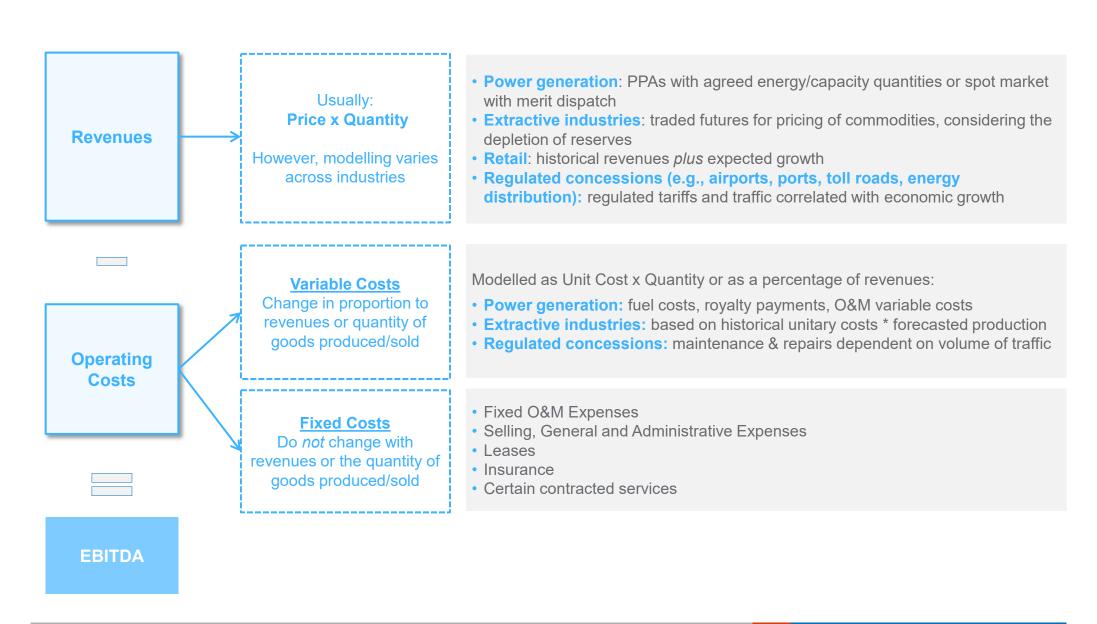
3

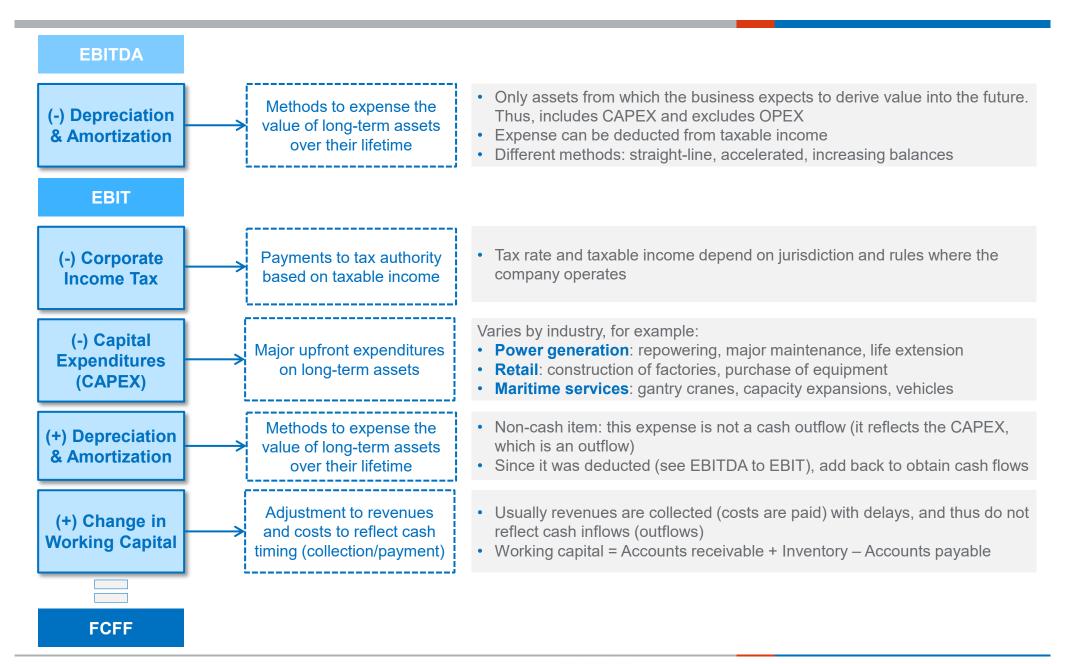(-) Debt Repayments (Principal)
(-) Interest Payments
(+) Tax Shields

Free Cash Flow to Equity (FCFE)

> Measures the "free" cash to equity holders after accounting for operating and investing expenses, as well as interest and debt repayments
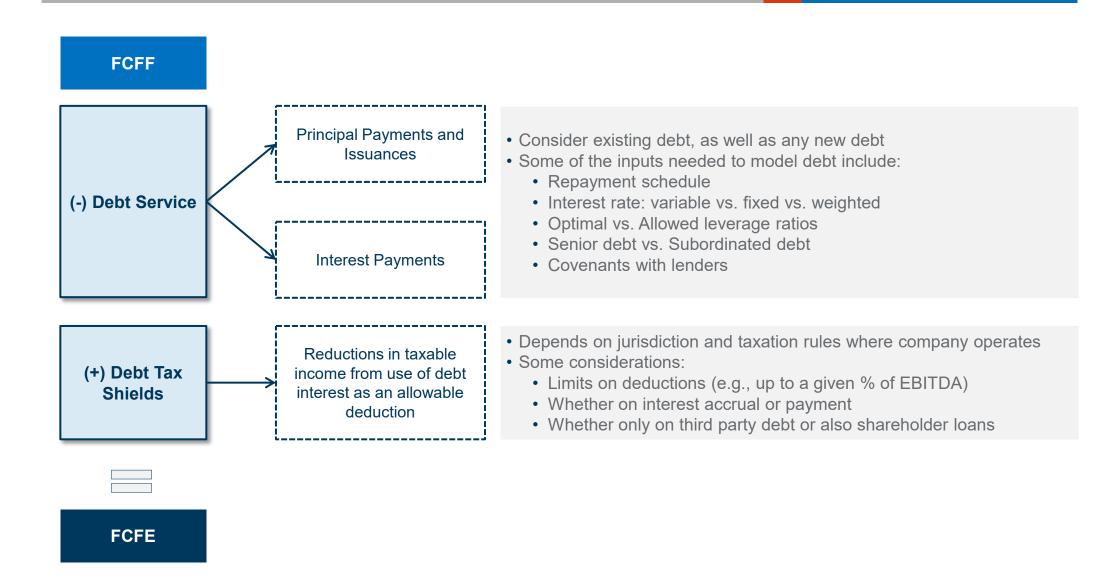
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MODELLING EBITDA

Revenues → Usually:
Price x Quantity

However, modelling varies across industries

- **Power generation**: PPAs with agreed energy/capacity quantities or spot market with merit dispatch
- **Extractive industries**: traded futures for pricing of commodities, considering the depletion of reserves
- **Retail**: historical revenues *plus* expected growth
- **Regulated concessions (e.g., airports, ports, toll roads, energy distribution):** regulated tariffs and traffic correlated with economic growth

Operating Costs

Variable Costs
Change in proportion to revenues or quantity of goods produced/sold

Modelled as Unit Cost x Quantity or as a percentage of revenues:

- **Power generation:** fuel costs, royalty payments, O&M variable costs
- **Extractive industries:** based on historical unitary costs * forecasted production
- **Regulated concessions:** maintenance & repairs dependent on volume of traffic

Fixed Costs
Do *not* change with revenues or the quantity of goods produced/sold

- Fixed O&M Expenses
- Selling, General and Administrative Expenses
- Leases
- Insurance
- Certain contracted services

EBITDA

MODELLING FREE CASHFLOWS TO THE FIRM

EBITDA

(-) Depreciation & Amortization → Methods to expense the value of long-term assets over their lifetime

- Only assets from which the business expects to derive value into the future. Thus, includes CAPEX and excludes OPEX
- Expense can be deducted from taxable income
- Different methods: straight-line, accelerated, increasing balances

EBIT

(-) Corporate Income Tax → Payments to tax authority based on taxable income

- Tax rate and taxable income depend on jurisdiction and rules where the company operates

(-) Capital Expenditures (CAPEX) → Major upfront expenditures on long-term assets

Varies by industry, for example:
- **Power generation**: repowering, major maintenance, life extension
- **Retail**: construction of factories, purchase of equipment
- **Maritime services**: gantry cranes, capacity expansions, vehicles

(+) Depreciation & Amortization → Methods to expense the value of long-term assets over their lifetime

- Non-cash item: this expense is not a cash outflow (it reflects the CAPEX, which is an outflow)
- Since it was deducted (see EBITDA to EBIT), add back to obtain cash flows

(+) Change in Working Capital → Adjustment to revenues and costs to reflect cash timing (collection/payment)

- Usually revenues are collected (costs are paid) with delays, and thus do not reflect cash inflows (outflows)
- Working capital = Accounts receivable + Inventory – Accounts payable

FCFF

MODELLING FREE CASHFLOWS EQUITY

FCFF

(-) Debt Service

Principal Payments and Issuances

Interest Payments

- Consider existing debt, as well as any new debt
- Some of the inputs needed to model debt include:
  - Repayment schedule
  - Interest rate: variable vs. fixed vs. weighted
  - Optimal vs. Allowed leverage ratios
  - Senior debt vs. Subordinated debt
  - Covenants with lenders

(+) Debt Tax Shields

Reductions in taxable income from use of debt interest as an allowable deduction

- Depends on jurisdiction and taxation rules where company operates
- Some considerations:
  - Limits on deductions (e.g., up to a given % of EBITDA)
  - Whether on interest accrual or payment
  - Whether only on third party debt or also shareholder loans

FCFE

OTHER CONSIDERATIONS

Forecasting Horizon

Limited life: 30-year port concession

Infinite life: Distribution company

Currency

Consistency across cashflow drivers

- **Revenues**: A solar plant with a dollar-denominated PPA that can also sell to the spot market in domestic currency
- **Costs**: A retail company faces labour costs in domestic currency but most raw inputs are paid in foreign currency
- **Debt**: Lender grants loan with two tranches denominated in different currencies

Exchange rate forecast

- Depending on the forecasting horizon, practitioners may have to project the foreign exchange rate into the future to express cashflows in a single currency

- Real vs. Nominal exchange rate

Discounting Cash Flows

TIME VALUE OF MONEY AND PRESENT VALUE

What is "present value"?

- *"A dollar today is worth more than a dollar tomorrow"*:
  - There is an opportunity to investment money:
    - Cost of money un-invested, an "opportunity cost," measured by return of investing it at a certain rate
    - The higher the opportunity cost, the more a dollar today is worth than a dollar tomorrow
  - The promise or expectation of a dollar tomorrow carries uncertainty to be received
    - This uncertainty represents risk; higher risk, more a dollar today is worth than a dollar tomorrow

Discount Rates

- Discount rates are the 'vehicle' to move future expected cash flows to the present
  - Allow us to assess the value today of an expected benefit tomorrow
  - Quantify risk and the opportunity cost of funds

THE DISCOUNT RATE IN THE DCF APPROACH

Once cash flows are forecasted, the next step is to discount them to the date of valuation at a risk-appropriate discount rate

Two Key Elements

(1) **Free Cash Flows**; (2) **Discount Rate**

In formula terms

$$Asset\ Value = \sum_{i=0}^{T} \frac{FCFF_i}{(1+r)^i}$$

Let's open the formula to better understand the mechanics of the calculation

$$Asset\ Value\ (I) = FCFF_0 + \frac{FCFF_1}{(1+r)^1} + \frac{FCFF_2}{(1+r)^2} + \cdots + \frac{FCFF_n}{(1+r)^n}$$

Discount Rate

COMPUTING PRESENT VALUE

Mechanics of computing the Present Value (PV) of expected future cash flows

Cash Flows

Present	Year 1	Year 2	Year 3
	$100	$100	$100

Discount Rate = 5%

$95 $100/(1+5\%)$

$91 $100/(1+5\%)^2$

$86 $100/(1+5\%)^3$

PV = $272

COST OF CAPITAL AS DISCOUNT RATE

What is the price of risk? The **cost of capital**

"The cost of capital is the **price charged by investors for bearing the risk that the company's future cash flows may differ from what they anticipate when they make the investment.** The cost of capital to a company equals the minimum return that investors expect to earn from investing in the company. That is why the terms *expected return to investors* and *cost of capital* are essentially the same. The cost of capital is also called the discount rate, because you discount future cash flows at this rate when calculating the present value of an investment, to reflect what you will have to pay investors."

Source: Koller, Goedhart, Vessels. 2011. Valuation: Measuring and Managing the Value of Companies. 5th Edition.

WEIGHTED AVERAGE COST OF CAPITAL (WACC)

Weight of Equity in the Capital Structure

Weight of Debt in the Capital Structure

$$WACC = CoE * \frac{E}{E + D} + (1 - t) * CoD * \frac{D}{E + D}$$

Cost of Capital

Cost of Equity

Rate of return required from equity investors in a project or business

Cost of Debt (after-tax)

Interest or return that a company pays to its debtholders or creditors

- Valuation using **Free Cash Flows to the Firm**, then the discount rate should be the **WACC**

- Valuation using **Free Cash Flows to the Equity**, then the discount rate should be the **Cost of Equity (CoE)**

CAPM: RELATIONSHIP BETWEEN RISK AND RETURN

Origin	Developed in mid-1960s by Sharpe (won a Nobel price for this), Lintner and Treynor

Expected return on investment

$$r = r_f + \beta * (r_m - r_f)$$

1. Risk Free Rate   3. Beta   2. Market Risk Premium

1. Risk Free Rate: return of risk-free assets

2. Market Risk Premium: expected return of the market portfolio over risk free asset

3. Beta: measures the stock's incremental risk to a diversified investor: how the stock co-varies with the aggregate stock market, sensitivity to sock market movements $(\beta_i = \sigma_{im} / \sigma^2_m)$

Expected return on investment

Security Market Line

r_m

Market Portfolio

r_f

Treasury Bills

Beta (β)

0   .5   1.0   2.0

EXPECTED RETURN BY EQUITY INVESTORS (COE)

The Cost of Equity is normally estimated using the CAPM formula + other 'ad-hoc' premiums

$$CoE = \underbrace{R_f + \beta * MRP}_{\text{CAPM Formula}} + Other$$

1 **2** **3** **4**

Risk Free Rate
- Rate of return on a security that has no default risk and no reinvestment risk
- Typically estimated using a long-term sovereign bond yield (e.g., 10-year U.S. T Bond)

Firm's Beta
- A measure of volatility or "systematic risk" of a security (or group of securities) compared to the market.
- **β<1**: Less volatile; **β=1**: same as market; **β>1**: More volatile

Market Risk Premium
- Difference between the expected return of the market portfolio (e.g., S&P 500 Index) and the risk-free rate

Other Risk Premium
- Practitioners may increase the cost of equity by adding "premiums" to account for certain risks not captured by the standard CAPM: (i) country risk; (ii) illiquidity risk; (iii) size premium; (iv) regulatory risk

EXPECTED RETURN BY DEBT HOLDERS (COD)

CoD can be estimated using several methodologies, but must be estimated in the same currency as CoE

1 **2**

$$\textbf{After Tax CoD} = \textbf{CoD} * (\textbf{1} - \textbf{t})$$

CoD

Common Estimation Approaches

- Yield to maturity on long-term bonds publicly traded "straight" bonds outstanding from the firm
- Synthetic approach which involves estimating a default spread (e.g., using corporate risk premium)
- Credit analysis which involves using the rating of the firm to estimate a default spread

Tax Effect

- Cash flows to the firm are based on cash flows before interest has been deducted
- Interests, however, are tax deductible, and such impact is accounted for by reducing the cost of debt to account for the savings associated with such tax deductibility

EXAMPLE FROM INTERNATIONAL ARBITRATION

Valores v. Venezuela ARB/13/11: Claimant proposed a WACC for a food products business in Venezuela of **10.12%**, while Respondent argued that it should be **19.16%** (over 9 percentage points higher)

Tribunal's Decisions		
Parameter	**Party**	**Approach**
Risk Free Rate	Claimant	10-year US T Bond
ERP (MRP)	Respondent	Historical arithmetic average
CRP	Claimant	Ratings-Based Default Spread
Size Premium	Claimant	Not applicable - zero
Cost of Debt	Claimant	Synthetic Approach

*"Taking into consideration the above, **the discount rate to be applied would be 10.2%...**"*

Tribunal's Adopted WACC = 10.2%

Cost of own capital:	
Risk-free rate	1.8%
ERP	6.11%
Beta (adjusted end)	0.93
Country risk premium	4%
Size risk premium	0%
	11.47%
Debt cost after taxes:	
Debt cost before taxes	4%
Industry premium	1.5%
Venezuela's tax rate	34%
	4.82%
Capital Structure:	
Debt-to-equity ratio	23.5%
Debt-to-total capital ratio	19.03%
Own capital to total capital ratio	80.97
WACC (Discount rate)	**10.2%**

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Final Remarks

ADVANTAGES & CHALLENGES OF THE DCF METHOD

Advantages

Transparency
- Components and underlying assumptions are clear
- Able to quantify the impact of each component

Flexibility
- Able to adjust individual parameters and accommodate case-specific instructions

Forward-looking
- Based on expectations rather than historical results

Widely used and proven
- Based on fundamental principles of economics and finance
- Leading academics and practitioners support the DCF methodology as the preferred valuation technique for income-earning assets
- Widely accepted as a tool for the computation of damages in the context of disputes

Challenges

Complexity
- Requires a large number of inputs and assumptions, many of which can sometimes be difficult to obtain/assess
- Results may be sensitive to certain assumptions (e.g., discount rate)
- Garbage In – Garbage Out

Early-Stage Ventures
- May not be the most appropriate way to value a start-up / depends on the ability to internalize risks and uncertainties

RELATED ADVANCED MODULES

Module 2.1
Advanced Income Approach

- Discusses how the business narrative influences the valuation model and the assessment of value
- Evaluating the probability that different scenarios materialize
- Terminal Value
- Implications of valuing an asset in a volatile macroeconomic environment

Module 2.2
Calculating the Discount Rate

- Key assumptions of a WACC calculation
- Theoretical explanation and practical issues of Cost of Equity and its components
- Country risk premium and size premium
- Common and alternative approaches to Cost of Debt

Appendix I:
Further Reading

SUGGESTED FURTHER READING

Link	Source
[1.](#)	ICCA-ASIL Task Force on Damages in International Arbitration
[2.](#)	Damodaran, A. *Investment Valuation*. 2nd Edition. Supporting Materials
[3.](#)	Koller, Goedhart, Vessels. 2020. *Valuation: Measuring and Managing the Value of Companies.* 7th Edition
[4.](#)	Brealey, Myers, Allen. 2019. *Principles of Corporate Finance*. 13th Edition

Appendix II:
Compass Lexecon's
International Arbitration Practice

WE ARE LEADERS IN OUR FIELD

Our team ranks within top three firms in GAR 100 Expert Witness Firms' Power Index since the inception of the ranking, and is recognized by *Who's Who Legal* as a leading expert witness firm, with highly respected experts and quality work products

Top Expert Witness Firm 2018, 2019, 2022
Compass Lexecon ranked first in *Global Arbitration Review*'s Expert Witness Firms' Power Index 2018, 2019 and 2022, with an average value of claims at USD 2,728 million and 52 hearings through 2018, USD 2,175 million and 49 hearings through 2019, USD 662 million and 39 hearings through 2022
It is noted for having the largest number of experts who are Global Elite Thought Leaders in *Who's Who Legal*

Arbitration Expert Witnesses 2022
Among over 200 arbitration experts surveyed worldwide by *Who's Who Legal,* 21 Compass Lexecon experts are named across North America, Latin America and EMEA
Seven of these experts were named amongst the Global Elite Thought Leaders in Arbitration, receiving the highest number of nominations from corporate counsel, peers and other market sources

" Compass Lexecon is "**strong right across the board- value, volume and reputation: making it something of a rarity**" *– Global Arbitration Review, 2021*

OUR TRACK RECORD

Our experts have extensive testimonial experience, having provided valuation, regulatory, contract, and economic opinions under treaty and commercial arbitration rules in all major venues and in a variety of industries

300+ various cases in arbitration in 10+ sectors

- Aerospace & Defense
- Agriculture, Fishing & Forestry
- Construction
- Consumer Goods
- Electricity
- Financial Services
- Gaming
- Mining
- Oil and Gas
- Pharmaceutical
- Real Estate and Hospitality
- Telecommunications
- Transportation
- Water and Sewerage

With 90+ client law firms and 250+ arbitrators

Involving 50+ countries and 20+ international and local venues

OUR ARBITRATION EXPERIENCE DIFFERENTIAL

Our team has unique advantages to act as regulatory and damage experts, and our credentials set us apart

Involved in more than 290 arbitrations
Related to investments in a variety of industries and jurisdictions (as detailed in the Appendix I)

Unparalleled testifying experience in international arbitration
Vast experience in litigation proceedings and contractual and treaty disputes at a worldwide level, additional advice and support to counsel and client prior to and during the arbitration process

International and multilingual team
Diverse team with core competencies in economics, finance, accounting, regulation and valuation

Quantum expertise and experience with all stages and aspects of arbitrations
Ability to assist client and counsel in determining the quantum implications of different case strategies, autonomous production of the report (including exhibits) conforming to Expert Witness standards, assistance in the economic interpretation of contracts

50+ strong team of economists almost exclusively dedicated to arbitration work
Can additionally assist with:
- Review quantum section of the brief and prepare visuals
- Assist counsel to prepare for cross examination of the counterparty's experts
- Assist client in negotiations or preparing internal presentations for management

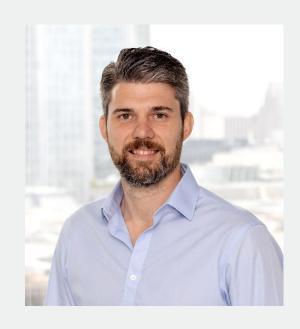# Appendix III: Biographies and Contact Information

JULIAN M. DELAMER

Quantum Expert with 15 years of experience in international arbitration matters

- Executive Vice President at Compass Lexecon (London and Buenos Aires)

- MBA from London Business School; B.A. in Economics; Postgraduate Degree in Corporate Finance

- Cardiff University Law School Bond Solon Civil Expert Certificate

- Recognized as Thought Leader in Arbitration by Who's Who Legal

- Participated in more than 70 commercial and treaty arbitration cases under ICSID, ICC, UNCITRAL and SCC rules (testifying expert in 20+ of these), as well as multiple domestic litigations

"*a star among valuation experts*" – Who's Who Legal 2021

"*very clever, thorough and professional in his approach to complex damages issues*" – Who's Who Legal 2019

"*ability to analyse and explain complex technical issues in layman's terms*" – Who's Who Legal 2020

Practice Areas:

- International Arbitration
- Damages
- Valuation & Financial Analysis
- Regulated Industries
- Energy
- Financial Markets
- Transportation
- Hospitality

ALAN G. ROZENBERG

15 years of experience applying economic and financial analysis; recognized by *Who's Who Legal* as a "Future Leader" as Expert Witness

- Senior Vice President at Compass Lexecon (London and Madrid)

- Masters in Finance from Universidad del CEMA (Argentina); B.A. in Economics from Universidad Nacional de Cuyo (Argentina)

- Participated in more than 40 commercial and treaty arbitration cases under ICSID, ICC, SCC, UNCITRAL and PCA rules, among others, implementing valuation models for equity investments, debt securities and derivatives

- Advised companies in mergers and acquisitions processes outside the international arbitration field and in State aid investigations

- Experience in various industries, including generation and distribution of electricity, oil and gas, retail and wholesale distribution, hospitality, airports, pharmaceuticals

- Recognised by Who's Who Legal as a Future Leader in Arbitration

- Regular guest speaker on damages quantification issues
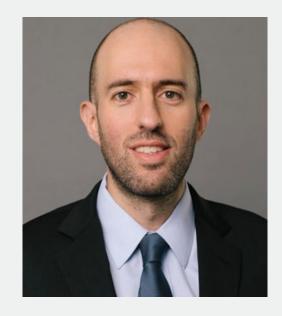
Practice Areas:

- International Arbitration
- Damages
- Valuation & Financial Analysis
- Policy and Regulation
- Energy
- Infrastructure
- Transportation
- Retail
- Hospitality

MIGUEL A. NAKHLE

20 years of experience applying economic and financial analysis; recognized by *Who's Who Legal* as a "Global Elite Thought Leader"

- Executive Vice President at Compass Lexecon (Houston)

- MBA, Rice University

- M.A. in Finance and B.A. in Economics, Universidad Torcuato di Tella (Argentina)

- Has provided written and oral testimony or expert advice in over 40 treaty and commercial cases under ICSID, UNCITRAL, ICC, LCIA, and other venues, as well as US litigation proceedings

- Designed and implemented complex valuation models related to assets in developing countries, with emphasis in developing countries

- Recognized as "Global Elite Thought Leader" in quantification of damages by Who's Who Legal (2021, 2022, 2023) and lauded for his "*deep understanding of the power generation sector […]*"

- Regular guest speaker on damages quantification issues

Practice Areas:
- International Arbitration
- Damages
- Energy
- Infrastructure
- Transportation
- Valuation & Financial Analysis

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