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ARBITRATOR

## Time warps in the assessment of risks

Mathematics and Economic Sciences in  
International Arbitration

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## Introduction: TV series and arbitration

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“Spoiler alert”: a reviewer's warning that a plot spoiler is about to be revealed (Merriam-Webster)

The spoiler problem seems particularly acute for TV, as the new habit of “binge-watching” (i.e. to watch all the shows from one series in one go) allows fans to jump ahead and spoil the stories for their friends and colleagues.

Why are spoilers a problem?

Because of the “curse of knowledge”

## The “curse of knowledge”

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The “tapping experiment”  
(Elizabeth Newton, 1990)

- She assigned people to one of two roles: “tapper” or “listener.”
- Each tapper was asked to pick a well-known song, such as “Happy Birthday,” and tap out the rhythm on a table. The listener’s job was to guess the song.
- **120** songs were tapped out.
- Before listeners guessed, Newton asked the tappers to predict how often listeners would guess correctly and they predicted **60** songs (**50%**)

Listeners guessed.....**3** (**2.5%**)

“**Curse of knowledge**”: once we know something—like the melody of a song—we find it hard to imagine not knowing it.

## The “curse of knowledge” in arbitration

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In arbitration cases, there is an inevitable **time-lag** between:

- The events leading to the dispute
- The time when the arbitration takes place

This time-lag inevitably results in:

- A “curse of knowledge” for arbitrators
- Differences between the *ex ante* and the *ex post* assessment of the facts

Most of these distortions are related to similar problems discussed by economists

Four practical illustrations:

- Are “subsequent remedial measures” proof of a previous negligence?

If a DCF model has been used to assess damages,

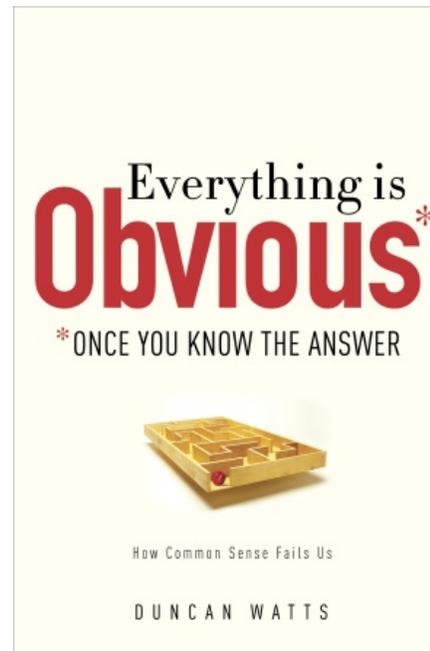
- Should the “wacc” also be used as pre-award interest rate? (“financial round-trips”)
- Can returns on sunk investment costs be deemed “excessive”?
- Should all political risks be included when calculating the discount rate?

# I. SUBSEQUENT REMEDIAL MEASURES

Dispute on damages from the initially faulty design of a machine by an engineering company  
Client's expert witness:

“The success of the later designs confirms that an appropriate design could have been achieved initially. In other words, the fact that a problem that occurred [in the design of a machine] was later solved, confirms, in and of itself, that the problem was foreseeable and avoidable in the first place, and demonstrates the supplier's gross negligence”

**WRONG!**



## SUBSEQUENT REMEDIAL MEASURES (cont.)

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### **Rule 407** of US Federal Rules of Evidence– Subsequent Remedial Measures

“When measures are taken that would have made an earlier injury or harm less likely to occur, evidence of the subsequent measures is not admissible to prove:

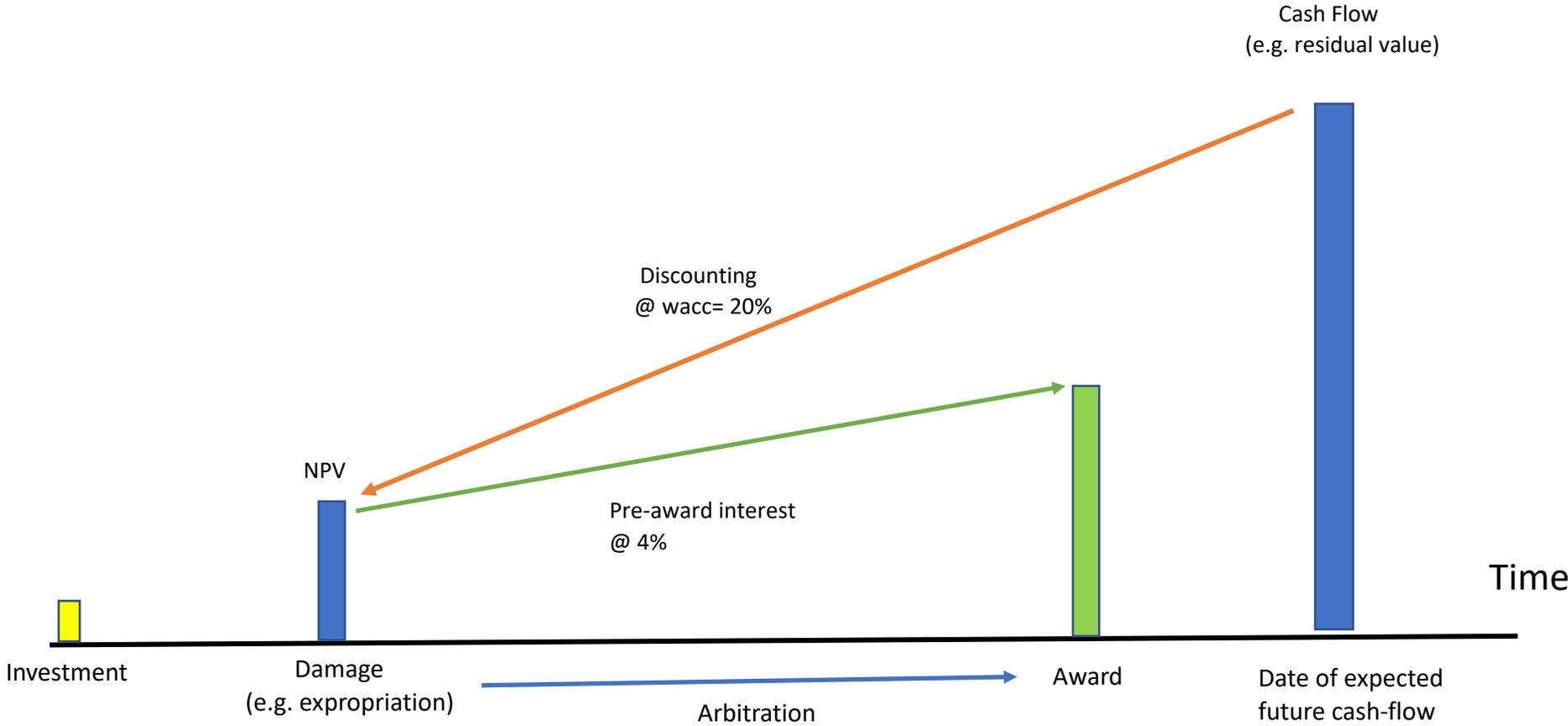
- negligence;
- culpable conduct;
- a defect in a product or its design; or
- a need for a warning or instruction”.

Origin: *Hart v. Lancashire & Yorkshire Ry. Co.* (1869) Baron Channel: ““It is not because the defendants have become wiser, and done something subsequently to the accident, that their doing so is to be evidence of any antecedent negligence.”

### **Article 7 e) of the EU Directive 85/374/EEC on Product Liability:**

“The producer of a defective product will not be liable if he proves (e) that the state of scientific and technical knowledge at the time when he put the product into circulation was not such as to enable the existence of the defect to be discovered”

# II. THE DCF MODEL AND FINANCIAL ROUND-TRIPS



## FINANCIAL ROUNDTRIPS (cont.)

### PAI=WACC for the industry

(Mabdala et al “Invalid Round Trips in Setting Pre-Judgement Interest in International Arbitration”, WAMR, 1, 2011)

- In competitive markets, firms will be earning on average a return equal to the cost of capital of the industry
- An “invalid round trip” (i.e. PAI < Discount rate) is inconsistent with principle of “full compensation”
- The wacc is the right measure of compensation for the opportunity cost for Claimant.

### PAI=risk-free rate

(Janis Joplin’s Yearbook and the Theory of Damages”, Journal of Accounting, Auditing & Finance (Vol. 5 ½, Winter/Spring 1990). Dolgoff & Duarte-Silva, “Prejudgement Interest and the Fallacy of the Invalid Round Trip”, WAMR, 10, 2016)

- The cost of capital represents the expected rate an investor earns in exchange for bearing risk (including possibility of loss)
- Expropriation deprived claimant of the risk associated with the asset
- Under the IRT argument, the riskier the underlying asset, the faster an award grows over time.
- Thus, Claimant should get a risk-free rate

## THE “PESO PROBLEM” IN FINANCIAL MARKETS

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The debate on “financial round-trips” in arbitration is closely related to the “peso problem” in financial markets.

- Starting in 1954, for more than two decades, the Mexican peso kept a fixed exchange rate to the dollar.
- But throughout that long period, the interest rate of bank deposits in Mexico, in pesos, was systematically higher than the interest rate of deposits, in dollars, in the US.
- Looked at *ex post*, while the peg remained fixed, this was puzzling: why hadn’t American investors taken advantage, on a massive scale, of such profitable “carry trade” (i.e. borrowing in dollars to invest in Mexico)? Were markets irrational?

In the early 70s, Milton Friedman provided an explanation: the interest rate differential reflected financial markets concerns that the peso could be devalued, even though it had remained fixed so far.

In the event, in August 1976, after the demise of the Bretton Woods system, the peso was allowed to float against the dollar and it depreciated by 46%.

Conclusion: market interest rates include a premium for very unlikely, but potentially catastrophic “**black swans**” (Taleb) that may not materialize for years.

## FINANCIAL ROUNDTRIPS (end)

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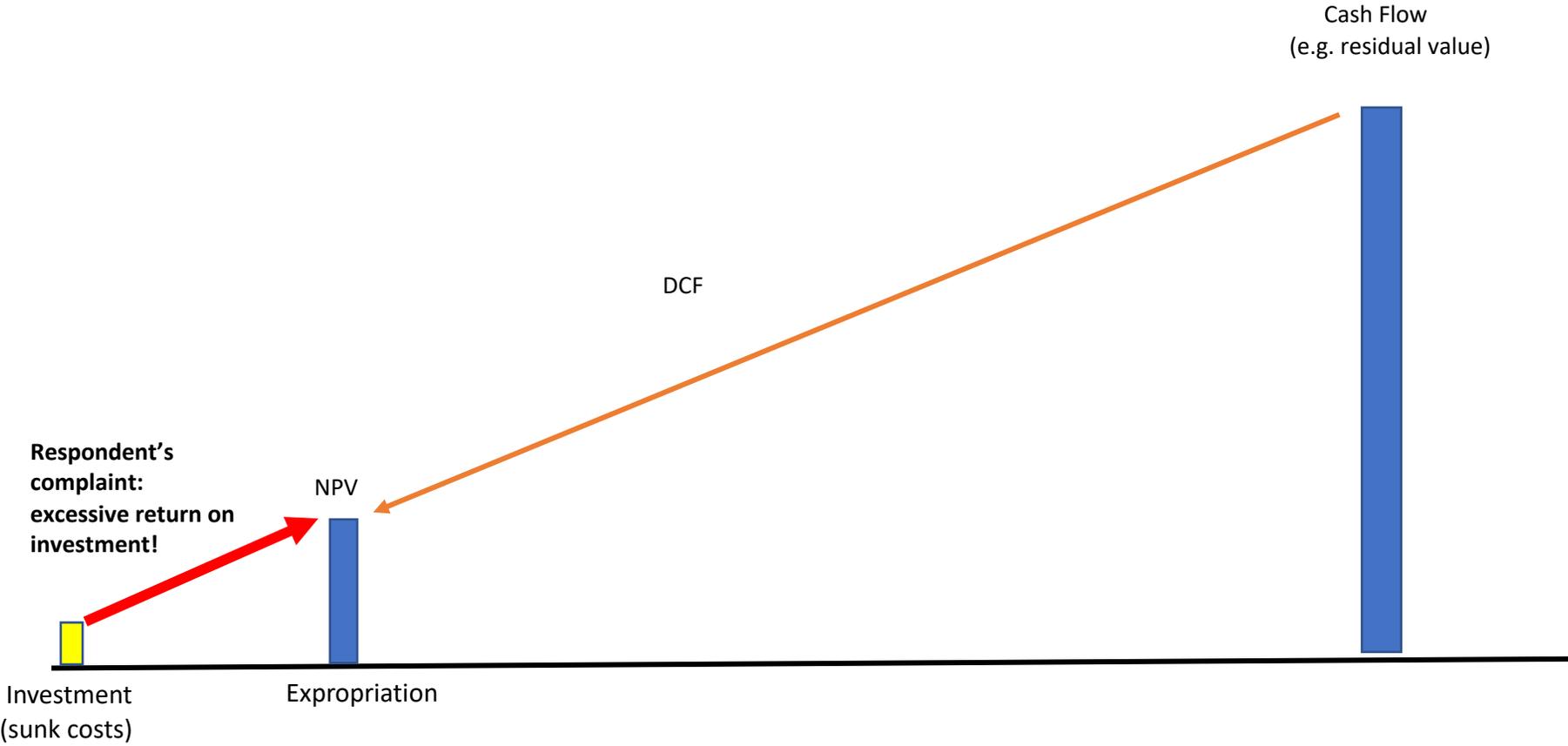
Additional approaches to determine the pre-award interest (PAI) rate:

- The “cost of debt” theory: PAI = actual borrowing costs which Claimant would have been spared, had compensation been paid by Respondent as of the breach date.
- The “coerced loan” theory: PAI = Respondent’s borrowing cost, since Claimant was implicitly forced to lend to Respondent from the date of breach until the award date.

No consistent approach by arbitration tribunals (e.g. *Saint-Gobain vs Venezuela*, 2016)

- “It would not be accurate to award Claimant interest at a rate that accounts for the risks of investing in a company located in Venezuela even though Claimant was no longer bearing these risks” (par. 874).
- “The loss to be compensated by awarding interest on the principal amount is the **time value of money**, without factoring in any risks that Claimant did not bear” (par. 877).
- “The interest rate should achieve a balance between avoiding the granting of a rate of return that would have not been achievable without considerable risk and acknowledging that Claimant would have been in a position to use its funds for more than just a risk-free investment” (par.881).
- “In sum, Claimant is entitled to pre-award interest at a rate of **2% over the average 6-month US T Bill rate**” (par. 882)

# III. EXCESSIVE RETURN ON SUNK INVESTMENT COSTS?



# DCF vs SUNK INVESTMENT COSTS

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The DCF method can only be applied under some conditions

*Rusoro vs Bolivarian Republic of Venezuela (2016)*

- The enterprise has an established historical record of financial performance
- There are **reliable projections of its future cash flow**, ideally in the form of a detailed business plan adopted in tempore insuspecto, prepared by the company's officers and verified by an impartial expert
- The price at which the enterprise will be able to sell its products or services can be determined with reasonable certainty
- The business plan can be financed with self-generated cash, or, if additional cash is required, there must be no uncertainty regarding the availability of financing
- It is possible to calculate a meaningful WACC, including a reasonable country risk premium, which fairly represents the political risk in the host country
- The enterprise is active in a sector with low regulatory pressure, or, if the regulatory pressure is high, its scope and effects must be predictable: it should be possible to establish the impact of regulation on future cash flows with a minimum of certainty

When a DCF is not practical to assess value, arbitrators rely, *inter alia*, on investment costs (e.g. inputs), as is also the case in many other areas.

# COSTS, AN (IMPERFECT) PROXY OF VALUE

Item	How to assess value		Observations
	Inputs (costs)	Outputs (outcomes)	
Goods	Labor theory of value (Classical Economists: Ricardo, Marx...)	Utility theory (Marginalists: Jevons, Walras, Menger)	In Alfred Marshall's famous analogy, costs (supply) and utility (demand) determine the market price jointly, as the upper and lower blades of a scissors
National Accounts: GDP components	Government-provided services (e.g. health services, education)	Market-provided <u>final</u> goods and services (i.e. excluding "intermediate transactions")	<ul style="list-style-type: none"> <li>UK's Atkison Report made an effort to develop output-based measures for government-provided services</li> </ul>
Accounting Standards (e.g. IAS, IFRS...)  Valuation of balance sheet items	<b>Historic Value Accounting</b> (i.e. historic value less amortization)	<b>Fair Value Accounting</b> (i.e. "mark-to-market" valuation)	<ul style="list-style-type: none"> <li>Gradual shift towards Fair Value Accounting.</li> <li>Some items can still be valued at "book value", even if sometimes subject to "impairment tests"</li> </ul>
Legal services (including arbitrators' fees)	Hourly rates	<ul style="list-style-type: none"> <li>Success fees</li> <li>Ad valorem fees (e.g. X% of amount in dispute)</li> </ul>	
Investment	<ul style="list-style-type: none"> <li><b>Investment costs</b> ("sunk costs")</li> <li>Book value</li> </ul>	<ul style="list-style-type: none"> <li><b>Discounted Cash Flows (DCF)</b></li> <li>Market approaches (multiples, comparable transactions/companies...)</li> </ul>	

# LIMITATIONS OF SUNK INVESTMENT COSTS TO DETERMINE VALUE

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## 1. Overvaluation

- Over-invoicing and extravagant investment expenditures
- Post-investment adverse changes made “sunk costs” become “*stranded costs*” (i.e. irrecoverable):
  - Regulatory changes (e.g. liberalization of previously regulated markets)
  - Emergence of disrupting technologies and new competitors
  - Unexpected adverse market trends

## 2. Undervaluation

- The investor, working in a risky environment against adverse odds, overcame barriers and faced significant risks before achieving economic success
- Post-investment favorable market changes (e.g. increased sale prices) produced a significant upside

The *ex post* rate of return on the initial investment may be exceptionally high, which may induce the host Government to claim that those exceptionally high, “unfair” benefits should be taxed away or, alternatively, the business should be expropriated, at a price not in excess of the initial investment cost.

## “ADJUSTED” INVESTMENT COSTS

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In order to overcome the limitations of investment costs, arbitrators may occasionally introduce adjustments:

- Negative adjustments for
  - Wasteful investment (e.g. lack of competitive bidding or efficient procurement)
  - Transfers to cover operating losses
- Positive adjustments for
  - Post-investment upward trends in sale prices (e.g. gold, oil...)
  - Loss of opportunity, when the amount of foregone profits was uncertain, but the likelihood of profits very high.

# WHEN ARE SUNK INVESTMENT COSTS RELEVANT?

*Can a forward-looking DCF methodology be applied?  
(i.e. do the Rousoro conditions apply?)*

*No, because cash-flows are  
too speculative*

Sunk investment costs may  
be an (imperfect) proxy for  
value

Yes

Sunk investment costs are  
irrelevant!

Ex post return on investment may be  
extremely high for lucky investors, as  
in gambling or lotteries!

## INVESTMENTS AS A FAIR LOTTERY

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That lucky investors should expect big returns on their investment was recognized in the XVIII c. by Adam Smith:

“In a perfect fair lottery, **those who draw the prizes ought to gain all that is lost by those who draw the blanks**. In a profession where twenty fail for one that succeeds, that one ought to gain all that should have been gained by the unsuccessful twenty.

The counsellor at law who, perhaps, at near forty years of age, begins to make something by his profession, ought to receive the retribution, not only of his own so tedious and expensive education, but that of more than twenty others who are never likely to make anything by it”.

(“The Wealth of Nations”, 1776, Book I, Chapter X, Part I on Inequalities arising from the Nature of the Employments themselves”)

Conclusion: when a forward-looking DCF model has been applied, the *ex post* rate of return on the initial investment is irrelevant!

## IV. POLITICAL RISK IN EXPROPRIATIONS

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**“Own credit paradox”**: when an entity’s creditworthiness deteriorates, the **fair market value** of its issued debt will decrease (as its market yield increases)

- In the case of big international banks using the “fair value option” (FVO) to measure their liabilities, the **deterioration** of their creditworthiness will cause an accounting **gain**, to be reflected in their P&L.

This accounting paradox became apparent during the 2008-2009 international financial crisis, when big international banks reported significant benefits....because, as a result of financial uncertainties and the doubts on their solvency, the market yield on their liabilities increased!

- After the sovereign debt crises of the 1980s, when Brady bonds were trading at deep discounts, some economists advocated **debt buybacks** as a solution to a country’s debt overhang.

e.g. In march 1988, Bolivia repurchased \$308 million (i.e. 46% of its total bank debt) by paying \$34 million, provided by donor countries

This stirred a debate on whether countries benefitted from such debt buybacks.

- In the case of expropriations, the higher the political risk...the lower the cost for the expropriating State?

## POLITICAL RISK IN EXPROPRIATIONS (cont.)

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BITs often require that compensation represents “the market value of the investment **before** the measures are taken or the impending measures became public knowledge, whichever is earlier”.

When using the DCF method, should the risk of expropriation by the host Government be reflected in the discount factor?

Yes, because

- FMV should be based on the **market value** that a **willing buyer** would pay to a willing seller
- The willing buyer would take into account **all political risks** of doing business in the country

No, because

- The discount rate can take into consideration country risks such as those resulting from a volatile economy or civil disorder, but not the confiscation risk, which is the result of the host State’s behavior.
- A State should not be allowed to **profit from its own wrong** (i.e. breaching its international obligations)

## POLITICAL RISK IN EXPROPRIATIONS: A SAMPLE OF AWARDS

Claimant (against Venezuela)	Tribunal's reasoning	Country risk premium (%)	Discount factor (=WACC)
<i>Gold Reserve</i> (2014)	“It was not appropriate to increase the country risk premium to reflect the market’s perception that a State might have a propensity to expropriate investments in breach of its obligations (par.841)	4	10,09%
<i>Venezuela Holdings</i> (Exxon Mobil) (2014)	“The confiscation risk remains part of the country risk and must be taken into account in the determination of the discount rate” (par. 365)	N/A	18%
<i>Tidewater</i> (2015)	“The country risk premium quantifies the general risks, including political risks, of doing business in the particular country” (par. 186)	14.75	N/A
<i>Saint-Gobain</i> (2016)	“The country risk premium must reflect all political risks associated with investing in Venezuela” (par.723, majority)	10.26	19.88
	“To reduce the recovery by applying a ‘fair market value’ that incorporates the very risk of the which the Claimant is being relieved by the Tribunal is to deny the Claimant full compensation. “The Tribunal takes away with one hand what it has purported to give with the other” (C.Bower’s dissent)		

## MAIN TAKE-AWAYS

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- Arbitration tribunals and parties should be aware of the “curse of knowledge” or “spoiler’s alert”: they know many things that the main characters of the story ignored!
- Rule 407: Subsequent remedial measures cannot be used as proof of previous negligence

When using the DCF method to assess damages,

- It is debatable whether the discount factor (wacc) should be used as pre-award interest rate
- Sunk investments costs are irrelevant: for lucky investors, the *ex post* rate of return on their investment may be very high (like in gambling!)
- In expropriations, it is debatable whether the country risk premium should reflect the host State’s inclination to breach its BITs’ obligations

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