

KEY DAMAGE COMPENSATION ISSUES IN OIL AND GAS INTERNATIONAL ARBITRATION CASES

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INTRODUCTION: WHY OIL AND GAS ARBITRATION DISPUTES ARE SO COMMON

Out of the 123 cases listed as “pending” under ICSID arbitration as of the end of 2007, forty-six (or 37%) were related to energy disputes.¹ Similarly, a look at the top fifty commercial arbitrations as listed by *The American Lawyer* in June 2007,² reveals that nineteen (or 38%) out of these fifty were related to energy arbitration, of which the overwhelming majority relates more specifically to oil and gas. There are certainly several motives parties may have in bringing oil and gas disputes. These motives may include environmental claims, shareholders commercial disputes, regulatory conflicts,³ trade restrictions, etc.

This Article concentrates on two motives that are critical in explaining the large incidence of oil and gas cases in treaty and commercial arbitration. First, the opportunism arising from large crude oil price swings. When crude oil price changes dramatically, some parties that are engaged in long-term contracts might have strong incentives to renegotiate. When renegotiation is not feasible, disputes arise. Second, since oil and gas resources are viewed in most countries as strategic, there is always a tendency to use public

1. International Centre for Settlement of Investment Disputes [ICSID], List of Pending Cases, <http://icsid.worldbank.org/ICSID/FrontServlet?requestType=GenCaseDtlsRH&actionVal=ListPending>.

2. *Arbitration Scorecard 2007: Top 50 Contracts Disputes*, THE AMERICAN LAWYER, June 13, 2007, available at <http://www.law.com/jsp/article.jsp?id=1181639139062>.

3. It is common to observe oil and gas arbitration disputes arising as a consequence of regulation conflicts, as energy facilities normally involve the access to bottleneck facilities such as pipelines and refineries, whose prices in some countries are regulated to avoid potential abuses on the exercise of monopoly power.

policy such that energy prices become a tool for income redistribution policies or other national policies that require alteration of existing long-term contracts.

Both motives have in common that they provide a window of opportunity to produce large transfers of wealth in a short period of time, and this, unsurprisingly, will tend to generate conflicts that end up in international arbitration or domestic litigation.

I. OPPORTUNISM IN TIMES OF CRUDE OIL PRICES SWINGS

Given the inherent risks and costs of exploration as well as development of oil and gas fields, these activities are typically arranged via long-term contracts. Normally, a government or a state-owned oil corporation grants a permit, license, or concession⁴ to explore and exploit a basin under some sort of contractual arrangement with private parties. Private parties, in turn, will find it useful to develop commercial arrangements to share the costs and hazards of exploration, as well as the risks related to volatility of crude oil prices.

Long-term contracts, thus, are a useful way to share and diversify risks in the sourcing of oil and gas, *ex-ante*. From an economic perspective, contracts promote efficiency since not only do they allow for risk sharing, but they also provide for an anticipated distribution of rents among involved parties, without the parties having to repeatedly bargain over the terms of trade when market conditions change.⁵

4. A typical license, permit or concession would involve the State (or a state-owned agency) to grant access to a private party for the exploration and exploitation of a block in a particular geographical area, usually for a limited number of years. In exchange, the State might require a revenue sharing or profit-sharing agreement, as well as payments of special taxes and royalties. Revenue-sharing agreements of the "kind or cash" type are also very common. Some of these arrangements might also include so-called "relinquishment clauses," which require private companies to either discover commercially proven reserves in a given period of time, or release the block back to the State. In addition, arrangements can include pecuniary targets for exploration work or investment expenditure targets. *See also* Alqurashi, Z. 2005. International Oil and Gas Arbitration. Special OGEL Study Vol. 3. p.36.

5. *See, e.g.,* Oliver E. Williamson, *Transaction-Cost Economics: The Governance of Contractual Relations*, in FIRMS, ORGANIZATIONS AND

When crude oil market prices trade at levels that are substantially above or below what parties might have expected, windows for opportunism materialize as one of the parties might have strong incentives to reshuffle the rent distribution. In particular, when the risks related to the exploration effort have been overcome, such costs become sunk and thus the likelihood for renegotiation and opportunism increases.⁶ At this stage, parties might attempt to renegotiate or engage in opportunistic behavior (which consequently, may bring about arbitration or litigation) given their desire to turn around the *ex-ante* bargain, into a redistribution of rents to their favor. The risk of opportunism is exacerbated by the fact that governments typically have reserved certain legal prerogatives as it relates to the ownership and management of the mineral resources and/or as a regulator of the sector.⁷

If we observe the increase of crude oil prices that started in early 2003,⁸ both measured in nominal and real terms, it is not difficult to see why so many oil and gas arrangements settled prior to this price

CONTRACTS: A READER IN INDUSTRIAL ORGANIZATION 168, 189 (Peter J. Buckley & Jonathan Michie eds., 1996) (comparing idiosyncratic transactions with efficiency of non-idiosyncratic contracts).

6. See Paul L. Joskow & Roger G. Noll, *Regulation in Theory and Practice: An Overview*, in STUDIES IN PUBLIC REGULATION 1, 44-45 (Gary Fromm ed., 1981) (detailing price dynamics and theories of disequilibrium in the market); Alice Hill & Manuel Angel Abdala, *Argentina: The Sequencing of Privatization and Regulation*, in REGULATIONS, INSTITUTIONS, AND COMMITMENT: COMPARATIVE STUDIES OF TELECOMMUNICATIONS 202, 203 (Brian Levy & Pablo T. Spiller eds., 1996) (linking sunk costs and opportunism in the telecommunications industry, making that industry, like the energy industry, vulnerable to expropriation). In oil and gas wells, as well as pipeline networks, assets cannot be moved to alternative uses in the same way that a metal stamping factory, for instance, could transfer most of its assets away into other types of manufacturing.

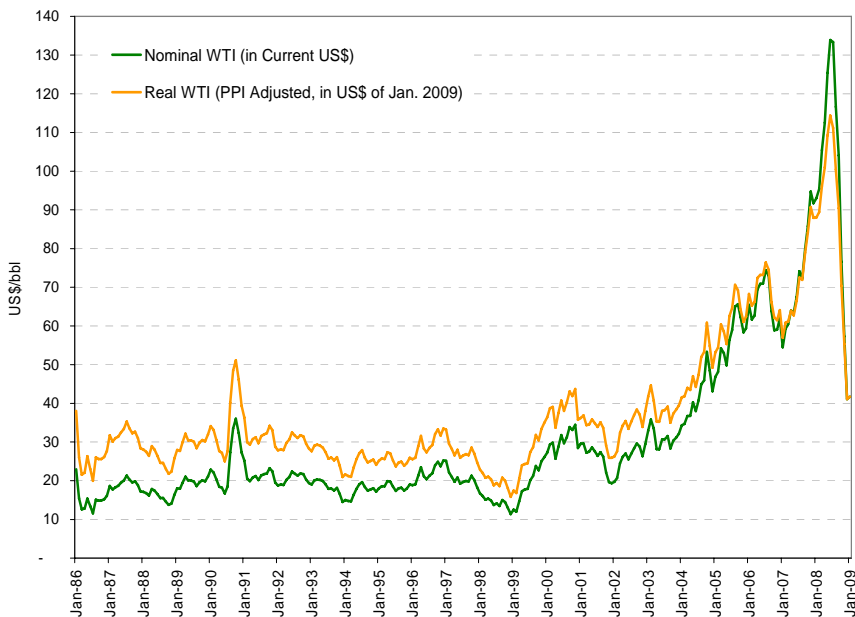
7. See Alqurashi, *supra* note 4, at 85.

Besides, petroleum agreements are generally characterized by state intervention in one way or another. The state may institute to its own favour exclusive public rights relating to the exploitation of petroleum such as state ownership of mineral resources or subjection of exploitation of petroleum to authorization by the state. In countries where the ownership of petroleum is not vested in the state, the state may nevertheless reserve broad regulatory powers as to the exercise of the right to exploit petroleum (e.g., regulations by the state regarding prospecting and production). *Id.*

8. *Saudi Arabia – The Oil Market Perspective*, APS REV. OIL MKT. TRENDS (Input Solutions), Sept. 24, 2007 (noting the increase in oil prices by 150 percent in US dollars since 2003).

surge are ending up in renegotiation, mediation, arbitration, and/or litigation. Figure I shows that the real price of WTI (West Texas Intermediate) crude oil from mid 2003 to the end of 2007 has increased from \$41.7 in January 2003 to \$114.4 in June 2008, back to the same level of \$41.7 in January 2009, all measured in constant dollar value as of January 2009. Such high levels and high volatility of prices were not observed in the prior 20 years to 2003.⁹ Thus, it

FIGURE I: WTI NOMINAL AND REAL PRICES¹⁰



9. WTRG Economics, Oil Price History and Analysis (Updating), www.wtrg.com/prices.htm (last visited Jan. 10, 2008) (analyzing the trends of crude oil prices, identifying effects such as the Asian economic crisis and the Yom Kippur war).

10. See U.S. Energy Information Administration. Cushing, OK WTI Spot Price FOB (Dollars per Barrel), available at http://tonto.eia.doe.gov/dnav/pet/hist_xls/RWTCm.xls (last visited Mar. 3, 2009); Bureau of Labor Statistics, PPI All Commodities, available at <http://data.bls.gov/PDQ/servlet/SurveyOutputServlet> (last visited Feb. 6, 2009).

should not be surprising that some parties have sought to renegotiate or unilaterally (and opportunistically) change contractual conditions to their favor.¹¹ In particular, several countries have tried to increase

11. See, e.g., *Mobil Invs. Can. Inc. v. Canada*, Request for Arbitration, ICSID Case No. ARB(AF)/07/4, ¶¶ 45-49 (Nov. 1, 2007), available at <http://www.international.gc.ca/trade-agreements-accords-commerciaux/assets/pdfs/MobilMurphy.pdf> (complaining about newly instituted Guidelines as a breach of contract); *Noble Energy Inc. v. Ecuador*, Decision on Jurisdiction, ICSID Case No. ARB/05/12, ¶¶ 14-15 (Mar. 5, 2008), available at <http://ita.law.uvic.ca/documents/Noblev.EcuadorJurisdiction.pdf> (claiming breach of contract through the alteration of the legal, contractual, economic and regulatory framework); *Ioannis Kardassopoulos v. Georgia*, Decision on Jurisdiction, ICSID Case No. ARB/05/18, ¶¶ 2, 40-41 (July 6, 2007), available at http://www.encharter.org/fileadmin/user_upload/document/Kardassopoulos.pdf (requesting arbitration for policies of the new Georgian government as breach of contract); *Ron Fuchs v. Georgia*, ICSID Case No. ARB/07/15 (pending) (concerning the arbitration of an oil and gas distribution enterprise); *Azpetrol Int'l Holdings B.V. v. Azerbaijan*, ICSID Case No. ARB/06/15 (pending) (relating to the arbitration of an oil and gas distribution, trade, storage and transportation enterprise); *Chevron Block Twelve v. Bangladesh*, ICSID Case No. ARB/06/10 (pending) (arbitrating the exploration, development and production of natural gas); *TG World Petroleum Ltd. v. Niger*, ICSID Case No. CONC/03/1 (settled Apr. 8, 2005); *ConocoPhillips Co. v. Venezuela*, ICSID Case No. ARB/07/30 (pending); *ENI Dación B.V. v. Venezuela*, ICSID Case No. ARB/07/4 (settled Apr. 18, 2008); *Mobil Corp. v. Venezuela*, ICSID Case No. ARB/07/27 (pending); *City Oriente Ltd. v. Ecuador*, ICSID Case No. ARB/06/21 (settled); *Liman Caspian Oil B.V. v. Kazakhstan*, ICSID Case No. ARB/07/14 (pending) (awaiting arbitration on the exploration and extraction of hydrocarbons); see also *Total S.A. v. Argentina*, ICSID Case No. ARB/04/1 (pending) (requiring arbitration over gas production and distribution and a power generation project); *El Paso Energy Int'l Co. v. Argentina*, Decision on Jurisdiction, ICSID Case No. ARB/03/15, ¶¶ 23-24 (Apr. 27, 2006), available at <http://ita.law.uvic.ca/documents/elpaso-jurisdiction27april2006.pdf> (objecting to breach of contractual obligations where “the Government began to withdraw fundamental rights and safeguards from investors in the energy sector”); *Pan American Energy L.L.C. v. Argentina*, Decision on Preliminary Objections, ICSID Case No. ARB/03/13, ¶¶ 20-21 (Jul. 27, 2006), available at <http://ita.law.uvic.ca/documents/PanAmericanBPJurisdiction-eng.pdf> (summarizing the allegations of the complainant of violations of international and Argentinne law); *Mobil Exploration & Dev. Inc. Suc. Argentina v. Argentina*, ICSID Case No. ARB/04/16 (pending); *Wintershall Aktiengesellschaft v. Argentina*, ICSID Case No. ARB/04/14 (Dec. 19, 2008); see generally *Embassy of Venezuela in the U.S.*, Fact Sheet: Arbitration Between ExxonMobil and Venezuela (Feb. 18, 2008), <http://www.venezuelanalysis.com/analysis/3174> (summarizing negotiations between Chevron, Statoil, Total S.A., ENI, and Venezuela’s national oil company PDVSA over projects in the Orinoco Oil Belt); *Davies Arnold Cooper, Venezuela Challenges \$12 Billion Freezing Order Obtained by ExxonMobil in Support of ICSID Proceedings*, WIRE: INT’L ARBITRATION, Feb. 25, 2008, at 1, available at

their “government take” on crude oil, either by increasing taxation, royalties, fees, rights, and duties by altering the pre-existing profit-sharing or revenue-sharing agreements with the private sector, or by requiring private companies to relinquish shareholdings in their companies to the State or to a state-owned oil company.¹²

[http://www.dac.co.uk/whatsnew/uploads/ExxonPDVSA\(1\).pdf](http://www.dac.co.uk/whatsnew/uploads/ExxonPDVSA(1).pdf) (citing ExxonMobil and ConocoPhillips as firms that refused to accept terms of PDVSA’s deal); Fernando Cabrera Diaz, *Ecuador Threatens Cancellation of Oil Contracts Unless ICSID Nixed as Arbitration Forum*, INVESTMENT TREATY NEWS, Sept. 1, 2008, at 6, available at www.investmenttreatynews.org/documents/p/21/download.aspx (discussing Ecuador’s \$70 million settlement with City Oriente in exchange for withdrawing its ICSID claim); Damon Vis-Dunbar, *Caratube International Oil Company LLP v. Republic of Kazakhstan: American Investor Sues Kazakhstan Over Oil-Field Dispute*, INVESTMENT TREATY NEWS, Sept. 28, 2008, available at <http://www.investmenttreatynews.org/cms/news/archive/2008/09/26/caratube-international-oil-company-llp-v-republic-of-kazakhstan-american-investor-sues-kazakhstan-over-oil-field-dispute.aspx> (reporting the breaches of fair and equitable treatment and expropriation alleged by Liman Caspian Oil); Michael Mortimore & Leonardo Stanley, *Has Investor Protection Been Rendered Obsolete by the Argentine Crisis?*, CEPAL REVIEW, Apr. 2006, at 15, 28-31 (cataloging legal proceedings brought before ICSID against Argentina).

12. See Russell Hotten, *Western Firms Settle Kazakhstan Oil Dispute*, THE DAILY TELEGRAPH (London), Jan. 15, 2008, at 5 (describing a group of major crude oil companies being forced to cede some control of the massive Kashagan oil field in Kazakhstan); Geri Smith, *Bolivia’s Risky Game*, BUSINESS WEEK, May 3, 2006, available at http://www.businessweek.com/globalbiz/content/may2006/gb20060503_773605.htm (reporting that some investors in Bolivia pay as little as 18% in royalties on oil); Sarah Hines, *Bolivia Under Evo Morales*, SOCIALISTWORKER.ORG, Oct. 27, 2006, http://socialistworker.org/2006-2/607/607_06_Bolivia.shtml (recounting the Bolivian government’s requirement to renegotiate contracts with terms more favorable to the government); Marcela Valente, *Argentina: Extension of Oil Contract Faces Court Challenge*, GLOBAL INFORMATION NETWORK, Sept. 21, 2007 (quoting vice president of MORENO in Argentina, commenting on Bolivia’s insistence on 50% royalties for natural gas); *Till the Pipes Squeak*, ECONOMIST, Dec. 10, 2005 (reporting the increase in the corporate income tax rate for oil companies in the North Sea from 40-50% in the UK); *Gov’t Hikes Oil Royalty, Gujarat, Assam to be Richer by Rs 400 cr*, THE HINDU BUSINESS LINE, Feb. 5, 2003, <http://www.hinduonnet.com/businessline/2003/02/05/stories/2003020502620100.htm> (indicating the approval of an increase in royalties for the Oil and Natural Gas Company in India); *Venezuela’s Chavez Squeezes Oil Companies with Taxes, Raids*, BLOOMBERG.COM, Aug. 24, 2005, http://www.bloomberg.com/apps/news?pid=nifea&&sid=a3z63_HrIvtc (reporting a raise in taxes on companies running oil fields to 50%); *Venezuela’s Hugo Chavez Targets Major Foreign Oil Companies in Nationalization Fight*, FOXNEWS.COM, Jan. 16, 2007, <http://www.foxnews.com/story/0,2933,243901,00.html> (elucidating the tactics of forcing nationalization and ending talks with big oil companies over planned takeovers); Inti Landauro, *Colombia Still Attracts Oil Cos Despite Higher*

II. INTRODUCTION OF PRICE CONTROLS AS A REACTION TO HIGH CRUDE OIL PRICES

Governments that use energy prices such as gasoline, gas oil, fuel oil, and natural gas as a tool of price control provide another source of current arbitration disputes, especially when such policies are against prior commitments and promises of keeping markets deregulated. With the post-2003 surge in energy prices, certain countries started to use price controls as a mechanism to avoid the impact of costly energy prices on customers. Absent compensation, these policies of subsidizing customers at the expense of energy producers have either created or have the potential to create arbitration disputes.¹³

Taxes, SMARTMONEY.COM, Sept. 25, 2008, <http://www.smartmoney.com/news/ON/index.cfm?story=ON-20080925-000884-1613> (pointing out that an increase in tax has not dissuaded investors from committing \$500 million); Sven Ridley-Wordich, *Offshore Oil Discoveries in Brazil to End Middle East Supremacy?*, RESOURCES INVESTOR, Apr. 25, 2008, <http://www.resourceinvestor.com/pebble.asp?relid=42274> (speculating that the increase in taxes after government review of legislation could potentially increase the special participation tax to between 40-60%); *Despite Record-Breaking Crude Oil Prices, Cost in Peru Remains Stable*, LIVING IN PERU, Mar. 4, 2008, <http://www.livinginperu.com/news-5886-miningenergy-despite-record-breaking-crude-oil-prices-cost-peru-remains-stable> (discussing the increase in taxes and royalties that will occur if the price of crude oil increases). Compare Patricia I. Vasquez, *Argentina Slaps Export Tax on Oil Firms*, OIL DAILY, Jan. 8, 2002 (describing the implementation of export taxes in addition to already existing royalty and earnings taxes) with *Argentina Details Export Tax*, OIL DAILY, Nov. 20, 2007 (recording a substantially increased export tax that effectively sets the levy at 121 percent when oil reaches \$93 a barrel, as compared to previous 45%).

13. See, e.g., Mortimore & Stanley, *supra* note 11, at 30 (documenting the complaint in *Total S.A. v. Argentina* because Total S.A. was not allowed to use its previously agreed upon mechanism for rate calculation); *Pan American Energy L.L.C.*, Decision on Preliminary Objections, ICSID Case No. ARB/03/13 ¶¶ 11, 21 (detailing the impacts of the Argentine financial crisis and the subsequent alleged infringements of Pan American's rights); *El Paso Energy Int'l*, Decision on Jurisdiction, ICSID Case No. ARB/03/15 ¶¶ 10-12 (alleging breaches of fundamental promises made by the Argentine government to induce investment after the Argentine financial crisis); *Wintershall Aktiengesellschaft*, ICSID Case No. ARB/04/14; *Sempre Energy Int'l v. Argentina*, Award, ICSID Case No. ARB/02/16, ¶¶ 93-106 (Sept. 28, 2007), available at http://icsid.worldbank.org/ICSID/FrontServlet?requestType=CasesRH&actionVal=showDoc&docId=DC694__En&caseId=C8 (arguing about the purpose of a PPI adjustment and justification for its alteration due to the economic crisis); *CMS Gas Transmission Co. v. Argentina*, Award, ICSID Case No. ARB/01/8, 44 I.L.M. 1205, ¶¶ 68-70 (2005)

III. DAMAGE METHODOLOGIES AS APPLIED TO OIL AND GAS CASES

A. USING AN APPROPRIATE DAMAGE METHOD

Estimating damage compensation in international arbitration disputes in the oil and gas industry poses several challenges from the perspective of a damage valuation expert. In particular, it is important to select a damage method that appropriately accounts for uncertainty in the value of future expected revenues.¹⁴ Valuing future revenues is essential in oil and gas companies since future expected profits (and thus value) is fundamentally affected by the estimated ability of the company to produce crude oil and gas from existing reserves (proven and probable), and sell it at future prices, which are quite volatile. Therefore, in the price dimension (and to a lesser extent in quantities), there is sizeable uncertainty, and thus risk, that must be accounted for.

Asset-based approaches utilizing either replacement values or book values of assets are not likely to be very useful in determining damages in oil and gas cases. This is because both methods provide an historical account of past investments and thus might not

(claiming devastating effects to profits and investment due to the government's refusal to adjust the PPI in the aftermath of the Argentine financial crisis); *Enron Corp. v. Argentina*, Award, ICSID Case No. ARB/01/3, ¶¶ 63-65, 71-72 (May 22, 2007), available at <http://ita.law.uvic.ca/documents/Enron-Award.pdf> (outlining complaints about the suspension on PPI adjustments, and their abolition through an emergency law); *AES Corp. v. Argentina*, Decision on Jurisdiction, 12 ICSID (W. Bank) 308, 309 (2005) (requesting arbitration for the Argentine government's failure to apply previously agreed tariff calculations and adjustment mechanisms); *LG&E Energy Corp. v. Argentina*, Decision on Liability, ICSID Case No. ARB/02/1, 46 I.L.M. 40, 48-49 (2007) (stating the direct price intervention measures taken by the Argentine government); see also *Noble Energy Inc.*, Decision on Jurisdiction, ICSID Case No. ARB/05/12 ¶ 20 (outlining the government intervention that aimed to lower wholesale electricity prices); Stephanie Ho, *China Caps Energy Prices in Bid to Control Inflation*, VOICE OF AMERICA NEWS, Jan. 10, 2008, <http://www.voanews.com/english/2008-01-10-voa10.cfm> (reporting the recent introduction of energy price freezes on oil products, natural gas, and electricity).

14. Manuel A. Abdala & Pablo T. Spiller, *Damage Valuation of Indirect Expropriation in International Arbitration Cases*, 14 AM. REV. INT'L ARB. 447, 455 (2003) (stressing the pitfalls of using transaction prices for damage valuations because of the fluctuations in pricing).

represent the value that shareholders can extract from future cash flows, thus failing to account for the true value (and risks) related to the activity. In addition, in emerging countries, accounting legislation might not require companies to price their assets in the books according to fair market values. Thus, discrepancies between market values and book values are likely to be relevant, in particular given the high volatility of crude oil prices which directly affects the market value of oil and gas companies.

Market-value approaches such as comparable sale transactions are useful as long as the assets are truly comparable. As usual, the difficulty with this approach is that it is hard to find an observable set of transactions that fit the counterfactual scenario, that is, that reflect sales prices in the absence of the damaging actions.

Income-based approaches, on the other hand, such as the Discounted Cash Flow (“DCF”) and the Adjusted Present Value (“APV”) methods are more suitable because they provide a more direct way to measure expected revenues (and their corresponding cash flows) into the future. This Article will focus on the DCF method, putting emphasis on its attributes and use as it relates to oil and gas cases. Finally, this Article will include a warning note on the use of the APV method, which is yet to be adopted as a standard practice in the profession.

B. KEY CONSIDERATIONS ABOUT THE DCF METHOD

The DCF is the most common methodology used in valuation analyses.¹⁵ First, it is widely supported by the professional literature, and its workings are well understood. Indeed, most investors rely on a DCF analysis to determine whether or not to undertake a particular project.¹⁶ Second, the DCF approach is widely accepted by

15. William C. Lieblich, *Determinations by International Tribunals of the Economic Value of Expropriated Enterprises*, 7 J. INT'L ARB. 37, 38 (1990) (explaining that the DCF method is the most common valuation method because it is the only method that can measure the amount of cash estimated to be earned by an entity on a day-to-day basis).

16. See Carlos Trejo, *Real Options: Understanding the Basic Concepts 1* (Sept. 2000) (unpublished assistantship project, Mississippi State University), available at <http://www.rstc.msstate.edu/publications/99-01/rstcofr01-042a.pdf> (contrasting DCF with other methodologies, illustrating its predominance in the valuation field).

international agencies, such as the World Bank, as a valid method to estimate damages and fair market valuations in international disputes.¹⁷ Indeed, in many energy cases panels have adopted the DCF method without hesitation.¹⁸

Several surveys also show that most financial managers prefer the DCF method over any other: Bruner, Eades, Harris, and Higgins show that 89% of the North American companies use the DCF as their primary firm valuation tool, and 7% use it as a secondary tool.¹⁹ Graham and Harvey²⁰ surveyed 392 Chief Financial Officers on the

17. See 2 THE WORLD BANK GROUP, LEGAL FRAMEWORK FOR THE TREATMENT OF FOREIGN INVESTMENT: GUIDELINES 41-42 (1992) [hereinafter WORLD BANK GUIDELINES]. The World Bank has stated that:

5. [i]n the absence of a determination agreed by, or based on the agreement of, the parties, the fair market value will be acceptable if determined by the State according to reasonable criteria related to the market value of the investment, i.e., in an amount that a willing buyer would normally pay to a willing seller after taking into account the nature of the investment, the circumstances in which it would operate in the future and its specific characteristics, including the period in which it has been in existence, the proportion of tangible assets in the total investment and other relevant factors pertinent to the specific circumstances of each case.

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; . . .

Id.

18. See *Starrett Housing Corp. v. Iran*, 16 Iran-U.S. Cl. Trib. Rep. 112, 201-02 (1987) (clarifying that Respondents did not object to use of the method, but its application); *AMCO Asia Corp. v. Indonesia*, Award, ICSID Case No. ARB/81/8, ¶¶ 105-107 (Oct. 17, 1990) (instituting the DCF method because it is flexible and allows application of judgmental elements); *Enron Corp.*, Award, ICSID Case No. ARB/01/3, ¶¶ 385-89 (adopting DCF to value companies, over Respondent's objections); *Sempra Energy Int'l*, Award, ICSID Case No. ARB/02/16, ¶ 416 (discussing asset base, discount rate, tariff increases and consumption effect while using the DCF model proposed); *CMS Gas Transmission*, 44 I.L.M. 1205, ¶ 416 (stating that "[t]his leaves the Tribunal with the DCF method and it has no hesitation in endorsing it as the one which is the most appropriate in this case . . . DCF techniques have been universally adopted, including by numerous arbitral tribunals, as an appropriate method for valuing business assets . . .").

19. See Robert Bruner et al., *Best Practices in Estimating the Cost of Capital: Survey and Synthesis*, 8 J. FIN. PRAC. & EDUC. 13, 17 (1998) (publishing various data, including that 100% of financial advisers rely on DCF at least in part).

20. See John R. Graham & Campbell R. Harvey, *The Theory and Practice of Corporate Finance: Evidence from the Field*, 60 J. FIN. ECON. 187, 187 (2001) (finding that large firms use present value techniques while small firms use the

practices used to evaluate real asset investments and found that the two most popular techniques were the DCF and the Internal Rate of Return (“IRR”) approaches.²¹ About three out of four firms in the survey used both methods. Observe that both methods, DCF and IRR, are forward looking methods. As Reilly and Brown say, the epitome of value *is* the present value of expected cash flows.²²

C. USE OF DCF AND PROVEN RECORDS OF PROFITABILITY IN OIL AND GAS

Often times we see that DCF is best recommended when companies are “a going concern with a proven record of profitability.”²³ A going concern with records of profits is simply thought to set a precedent indicating the ability of the company to continue such performance in the future, and thus implicitly exhibiting a lower degree of uncertainty in estimating damages. However, in the oil and gas sector, neither being a startup company (as opposed to a going concern) nor lacking a historic record of profitability are serious impediments for using the DCF method in estimating damages. Oil and gas companies derive their primary value on the existence of reserves, and much less so on the ability to develop and extract such reserves and later sell them to the market.

Indeed, the usefulness of the DCF method must be judged on a case-by-case basis, an exercise that must be able to identify if there are any company-specific constraints and geological or geographic difficulties. It must also take into account the degree of field development, crude oil characteristics, the quality of reserves, and the expectations of future crude oil prices. Given that the marketplace for crude oil is that of a tradable commodity, and given

payback criterion).

21. *See id.* at 196 (finding that most large firms use some kind of discounted cash flow analysis). The IRR method is nothing but a variant of the DCF method, which is used more to estimate expected returns on a project, rather than to perform a valuation exercise—IRR computes the discount rate that makes the net present value of future cash flows of a project equal to zero.

22. FRANK K. REILLY & KEITH C. BROWN, INVESTMENT ANALYSIS & PORTFOLIO MANAGEMENT 378 (Southwestern/Thomson-Learning 7th ed. 2003) (specifying measures of cash flow as dividends, operating free cash flow, and free cash flow to equity).

23. WORLD BANK GUIDELINES, *supra* note 17, at 42.

that oil companies derive their primary value from discovered certified reserves, the DCF cannot be ruled out simply because the company is a startup, or because the company has not yet established historic records of profitability. A case-by-case analysis is called for.

D. DEALING WITH UNCERTAINTY AND CRUDE OIL PRICE VOLATILITY

Applying the DCF method in oil and gas cases raises the question of uncertainty and high volatility of future crude oil prices. Indeed, this uncertainty factor has frequently been confused with an alleged speculative nature of making future cash flow projections.²⁴ Projecting future cash flows, however, is not a speculative event, and certainly should not be compared to the obscure 16th century prophecies of Nostradamus, as Professor Seidl-Hohenveldern once portrayed.²⁵ Projecting future cash flows, on the contrary, involves careful judgment of parameters and economic variables into the future, which requires reasonable assumptions.

This judgment, of course, involves making decisions of future values that are uncertain. However, the DCF technique addresses uncertainty in at least three different ways. First, uncertainty and risks that are specific to the project can be built within the cash flows projections themselves, by using scenarios that are more likely and more reasonable. Take for example the uncertainty about future crude oil prices given the increased volatility of the last six years.

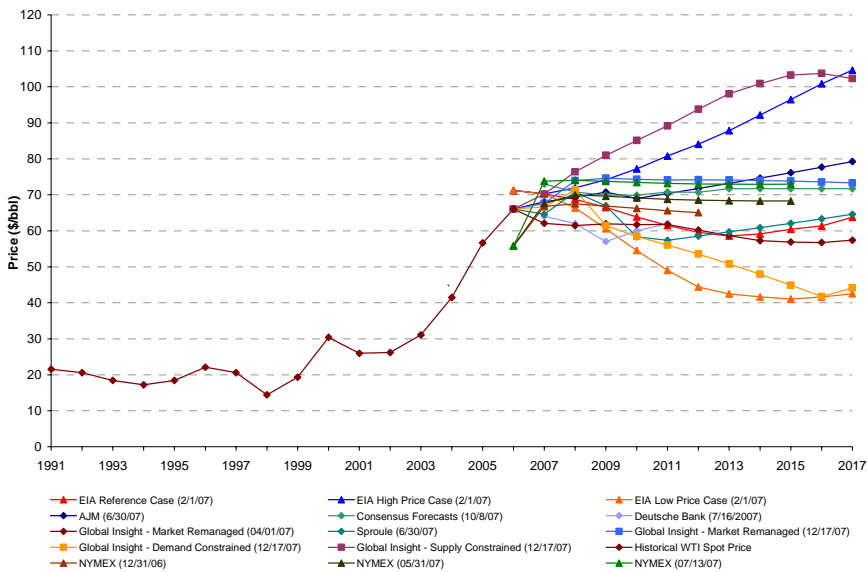
As Figure II illustrates, by 2006 there were already multiple projections for expected crude oil prices from 2007 onwards. Expectations as of 2007, or as of 2008 or 2009, would similarly

24. See, e.g., *CME v. Czech Republic*, Separate Opinion of Ian Brownlie, UNCITRAL Arbitration, ¶ 68 (Mar. 13, 2003), available at http://ita.law.uvic.ca/documents/CME2003-SeparateOpinion_000.pdf (repeating the concerns expressed by the Iran-US Claims Tribunal as to the speculative nature of long-term cash flow projections); see also *LG&E Energy Corp. v. Argentina*, Award, ICSID Case No. ARB/02/1, ¶¶ 59, 89-90 (July 25, 2007) (rejecting using the DCF method, insisting on the speculative nature of future of projections, in a quite isolated opinion within the Argentine cases); *Enron Corp. v. Argentina*, Award, ICSID Case No. ARB/01/3, ¶ 385-89 (May 22, 2007), available at <http://ita.law.uvic.ca/documents/Enron-Award.pdf> (highlighting the uncertainties resulting from the assumptions of the approach, but nevertheless adopting DCF).

25. See Thomas W. Wälde, *Remedies and Compensation in International Investment Law*, TRANSNAT'L DISPUTE MGMT. 51 (2005).

show forecasts with all sort of tendencies, also going in opposite directions. Valuation exercises in such volatile environments, therefore, require a reasonable judgment, by using all information available, possibly discarding projections that are considered extreme or outliers to the sample, and adopting a path that is consistent with the majority of forecasts.

FIGURE II: CRUDE OIL PRICE PROJECTION EXAMPLE
(AS OF END OF 2006)²⁶



26. Forecast date (or Nymex trading date) in parentheses. All data excluding that from the EIA were received in current dollars. Data from the 2007 EIA Annual Energy Outlook forecasts were received in 2005 dollars and converted to current dollars using the EIA inflation assumptions. See ENERGY INFORMATION ADMINISTRATION, ANNUAL CUSHING, OK WTI SPOT PRICE FOB, available at <http://tonto.eia.doe.gov/dnav/pet/hist/rwtca.htm> (last visited Mar. 3, 2009). Forecasted data based on AJM Petroleum Consultants Price Forecast as of June 30, 2007; Consensus Forecasts 'Global Outlook' released on October 8, 2007; Deutsche Bank analyst report released on July 16, 2007; EIA 2007 'Annual Energy Outlook' released in February 2007; Global Insight Price Forecasts as of April and December 2007; Nymex WTI Futures Prices as of December 31, 2006, May 31, 2007 and July 13, 2007; Sproule Associates Price Forecasts as of June 30, 2007.

Second, general risks such as investing in equity as opposed to safer government bonds, political risk, business cycle fluctuations, and macroeconomic events are captured through the use of a discount rate. Panels in oil and gas cases have taken into account these uncertainties and general risks when using discount rates. For example, as pointed out by Professor Marboe:

The Tribunal in Phillips Petroleum followed this method of valuation—put forward by the Claimant’s expert—very clearly and transparently. The applied discount rate of 4.5 per cent was explained by the reference to average real rates of return to investors in U.S. non-financial corporations, which at the time of expropriation were 6 per cent. As it was generally held that investments in oil enterprises were less risky than average investments in the market, the discount rate was reduced.²⁷

Finally, when small variations to critical assumed parameters produce large effects on future cash flows, the damage expert must provide the panel what is known as a “sensitivity analysis,” which would inform the panel of how damages change under lower/higher values of the parameters whose small variation can imply significant changes in quantum.²⁸

E. A WARNING ON THE APV METHOD

APV is a firm valuation method that also uses discounted cash flows, except that, unlike the traditional DCF approach, it incorporates the tax benefits of sourcing debt through the cash flows instead of through the discount rate, as computed under the traditional DCF analysis.²⁹ It is therefore thought that the APV

27. See Phillips Petroleum v. Iran, Statement by Judge Khalilian, 21 Iran–U.S. Claims Tribunal Reports (1989) 194, 229, cited by Marboe, I.2006 Compensation and Damages in International Law: The Limits of Fair Market Value, *Journal of World Investment and Trade*, Vol 7. n° 5, p. 740.

28. See Samuel C. Thompson, Jr., *A Lawyer’s Guide to Modern Valuation Techniques in Mergers and Acquisitions*, 21 IOWA J. CORP. L. 457, 499-500 (1996) (analyzing the potential estimation errors through sensitivity analysis preparation of cash flow projections and suggesting the preparation of three cash flow analyses: expected, pessimistic, and optimistic).

29. See Timothy A. Luehrman, *Using APV: A Better Tool for Valuing Operations*, HARV. BUS. REV., May-June 1997, at 151 (explaining that the APV

method can have some advantages over DCF when companies have complex leverage structures, as well as complex income tax arrangements, both features that might be present in oil and gas cases.³⁰

Professor Pablo Fernandez of IESE Business School shows that when leverage and associated risk of cash flows and cost of bankruptcy are properly accounted for, the APV and the DCF approach (which uses the weighted average cost of capital (“WACC”) to account for the tax benefits of debt) are equivalent.³¹

We show that the three valuation methods (APV, WACC and Flows to Equity) always yield the same result. The paper also shows the relationships among cost of equity, cost of unlevered equity, cost of debt and weighted average cost of capital. We show the equivalence of the three approaches to firm valuation for perpetuities, then for growing companies (at a constant rate g) and, finally, for any company.³²

However, Professor Damodaran provides some words of caution about the APV method, especially in cases of firms with high debt ratios, given how difficult it might be to value the financial distress component:

There are many who believe that adjusted present value is a more flexible way of approaching valuation than traditional discounted cash flow models. This may be true in a generic sense, but APV valuation in practice has significant flaws. The first and most important is that most practitioners who use the adjusted present value model ignore expected bankruptcy costs. Adding the tax benefits to unlevered firm value to get to the levered firm value makes debt seem like an

calculates the firm value as the sum of the unlevered firm value plus the value of net tax benefits due to debt financing—measured as the present value of the yearly tax shield (the taxes that the company avoids paying due to leverage), less an amount representative of the cost of financial distress).

30. *See id.* at 154 (identifying biases in the analysis if stocks and bonds are taxed differently, and realizing that APV is still a DCF methodology).

31. *See* Pablo Fernandez, *Equivalence of the APV, WACC and Flows to Equity Approaches to Firm Valuation 1* (Aug. 30, 1997) (unpublished manuscript), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=5737 (also showing that the net present value of a tax shield due to interest payments must be calculated with a particular APV formula).

32. *Id.*

unmixed blessing. Firm value will be overstated, especially at very high debt ratios, where the cost of bankruptcy is clearly not zero and, in some instances, the cost of bankruptcy is higher than the tax benefit of debt.³³

Therefore, despite its apparent innovations, the APV method might yet not be ready to be a substitute to the DCF, which is still considered the gold standard in income-approach valuation methods.

IV. VALUATION DATES AND USE OF HINDSIGHT INFORMATION

The selection of valuation dates, and to what extent the damage expert should use the benefits of hindsight information in performing a valuation is of considerable importance in oil and gas cases, given the volatility of crude oil prices. Unlike general damage valuation theory and practice, where there is no pre-established practice as to the setting of a valuation date or as to whether to rely on the use of hindsight information, in expropriation matters there is certain tension regarding the choice of valuation date and the use of hindsight information. This tension arises because, on the one hand, there is the concept that the valuation of an expropriation matter is supposed to be conducted at the moment “immediately before the time at which the taking occurred or the decision to take the asset became publicly known,”³⁴ whereas, on the other hand, to fully compensate the damaged party à la Chorzów,³⁵ the valuation has to restore the financial position that the damaged party would have had today in the absence of the harm, and thus a valuation date as close as possible to the date of award might be of order.³⁶ Similar logic

33. Aswath Damodaran, *The Adjusted Present Value Approach*, http://pages.stern.nyu.edu/~adamodar/New_Home_Page/valquestions/apv.htm; see Thierry Senechal, *Dealing with Uncertainty: Discounted Cash Flow (DCF) Versus Adjusted Present Value (APV)*, TRANSNAT'L DISPUTE MGMT., June 2007, at 1 (comparing the DCF and APV methods further).

34. WORLD BANK GUIDELINES, *supra* note 17, at 41.

35. See *Factory at Chorzów*, (Ger. v. Pol.), 1928 P.C.I.J. (ser. A) No. 13, at 47 (Sept. 13) (containing the most cited compensation principle that “. . . reparation must, as far as possible, wipe out all the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed.”).

36. See *ADC Affiliate Ltd. v. Hungary*, Award, ICSID Case No. ARB/03/16

applies to damaging actions other than expropriation, such as unfair and inequitable treatment, or discrimination.

Using valuation date at the time of expropriation raises at least two important considerations: First, if the valuation exercise is done using only expectations at the time of expropriation, without looking at hindsight, there is a risk that the compensation might not restore the investor with the financial position it would have had in the absence of the taking. This is so because post-expropriation events (for instance higher crude oil prices) might imply a business that is, at the time of the award, more valuable than at the time of expropriation. Second, when expropriation is the result of consequential measures, the use of hindsight information is highly recommended and the selection of a valuation date at a date closer to the date of the award would provide a more accurate estimate of damages.³⁷

Indeed, in *Amco Asia Corp. v. Indonesia*, the ICSID Tribunal uses hindsight information and emphasized that, in line with the *Chorzów Factory* principles, information that became known after the date of the wrongful act had to be taken into account:

If the purpose of compensation is to put Amco in the position it would have been in had it received the benefits of the Profit-Sharing Agreement, then there is no reason of logic that requires that to be done by reference only to data that would have been known to a prudent businessman in 1980.³⁸

¶¶ 484-94 (Oct. 2, 2006) (emphasizing the widespread use of the *Chorzów* principles in international arbitration).

37. See Manuel A. Abdala & Pablo T. Spiller, *Chorzów's Standard Rejuvenated: Assessing Damages in Investment Treaty Arbitrations*, 25 J. INT'L ARB. 103, 104 (2008) (explaining that hindsight information not only allows courts to calculate the residual value of the investment after the measures, but also to capture any elevated value due to improved business conditions which investors were deprived of due to the state measures); Irmgard Marboe, *Compensation and Damages in International Law: The Limits of "Fair Market Value"*, 7 J. WORLD INVESTMENT & TRADE 723, 752 (2006) (noting that the European Court of Human Rights has repeatedly cited the *Chorzów Factory* principles of compensation and in doing so, awarded amounts that took into account the increase in value of unlawfully expropriated property between the time of the taking and the date of the award).

38. *Amco Asia Corp. v. Indonesia*, 1 ICSID (W. Bank) 569, 614 (May 31, 1990) (adding that "[t]he only subsequent known factors relevant to value which

The *Amco* panel also stated that:

But as to valuation techniques, for 1980-1989 the Tribunal will not use the perspective of what the reasonable businessman in 1980 could foresee, because for this period it can use known data for relevant factors, including the year-by-year inflation rate, as provided to the Tribunal by the World Bank, from Laporan Minggu, Bank Indonesia, as well as actual exchange and taxation rates.³⁹

Most recently, in various arbitration awards involving energy disputes in Argentina (*CMS v. Argentina*, *Sempra v. Argentina*, and *Enron v. Argentina*) the Tribunals actually relied on valuation exercises that used hindsight information to determine damages.⁴⁰

The *Chorzów Factory* compensation standard has a powerful economic logic when dealing with cases in which the value of the assets exhibits volatile changes, such as in the oil and gas industry. The underlying logic forces the party that inflicted damages to bear the *ex-post* risks associated with the damaged or taken asset, up to the time of the award. In the case the value of the asset increases in that period, the windfall would belong to the claimant by valuing the compensation at the date of the award using hindsight information, whereas if the asset would have lost value in the absence of the damaging measures, the damaging party would absorb

are not to be relied on are those attributable to the illegality itself.”).

39. See *id.* at 616-17 (adding that in order to maintain real value, the known yearly inflation rate would be added to the base value, but that the DCF standard would apply after 1990, when no fixed inflation rates information was available).

40. See *CMS Gas Transmission Co. v. Argentina*, Award, ICSID Case No. ARB/01/8, 44 I.L.M. 1205, ¶¶ 418-472 (2005) (suggesting that although it is possible to estimate a rational value by analogy, the accurateness will not be verified until time has passed); *Enron Corp. v. Argentina*, Award, ICSID Case No. ARB/01/3, ¶¶ 346-452 (May 22, 2007), available at <http://ita.law.uvic.ca/documents/Enron-Award.pdf> (weighing the DCF approach, against the book value and unjust enrichment approach regarding damages); *Sempra Energy Int'l v. Argentina*, Award, ICSID Case No. ARB/02/16, ¶¶ 398-486 (Sept. 28, 2007), available at http://icsid.worldbank.org/ICSID/FrontServlet?requestType=CasesRH&actionVal=showDoc&docId=DC694_En&caseId=C8 (evaluating two different methodologies for arriving at an appropriate remedy, whether a party created or destroyed value, compared with the value of the firms, minus the pesification scenario, plus the historical damages).

the loss in value by valuating compensation at the date of the taking.⁴¹

Chorzów Factory's compensation principle puts States on notice that treaty violations will not grant them economic windfalls, in particular if States act opportunistically at times when crude oil prices soar.⁴²

In line with common practice in general damage valuation cases,⁴³ using hindsight information captures any elevated value due to improved business conditions which claimants were deprived of due to the measures by the party inflicting damages. In addition, it provides incentives for parties not to act opportunistically when business conditions are expected to improve, thus acting as a deterrent. Finally, its use provides accurate and adequate damage estimates, given that with the benefit of hindsight the damage expert can compute actual damages as time passes by. The latter is critical information that panels usually welcome and are not likely to ignore.⁴⁴

41. See *Factory at Chorzów* (Ger. V. Pol.), 1928 P.C.I.J. (ser. A) No. 13, at 50-51 (Sept. 13) (stating that “the value of the undertaking at the moment of dispossession doesn’t necessarily indicate the criterion for the fixing of compensation,” and that the Court must contemplate the financial results which would “probably have been given by the undertaking thus constituted” up to the date of the present judgment, and the value at the date of the present judgment of the same undertaking if that undertaking had remained in the hands of the German entities).

42. See *id.* at 45-46 (explaining that Poland could not rely on the treaty of Versailles to annul a sale because it suited Poland’s needs). Notice that in a volatile price environment, such as oil and gas, this principle implies that damages will inevitably vary depending on the timing at which the case is decided.

43. See Michael K. Dunbar & Michael Joseph Wagner, *Differences Between Economic Damage Analysis and Business Valuation*, in *THE HANDBOOK OF BUSINESS VALUATION AND INTELLECTUAL PROPERTY ANALYSIS* 328, 331 (Robert F. Reilly & Robert P. Schweihs eds., 2004) (noting that the use of hindsight information in computing damages is generally accepted in U.S. courts, which is usually referred to as of using the “book of wisdom”); see also SHANNON P. PRATT, ROBERT F. REILLY & ROBERT P. SCHWEIHS, *VALUING A BUSINESS: THE ANALYSIS AND APPRAISAL OF CLOSELY HELD COMPANIES* 869 (4th ed. McGraw-Hill 2000) (referring to this mode of calculating damages as “the Before-and-After Method”).

44. *But see* *INA Corp. v. Iran*, 8 Iran-U.S. Cl. Trib. Rep. 373, 380 (1985) (stating that “[f]air market value may be stated as the amount which a willing buyer would have paid a willing seller . . . disregarding any diminution of value due to the nationalization itself . . . and excluding consideration of events thereafter

The exclusion of hindsight information is contrary to *Chorzów Factory's* compensation standard because between the time of the enactment of the measures and the resolution of the case, exogenous events such as an increase in the price of crude oil may happen. These occurrences would change the value of the affected assets in the absence of the damaging actions. Such exogenous events could relate to changes in demand, interest rates, input, or output prices.

Since States are tempted to act opportunistically precisely when business conditions are expected to improve or have already improved, the use of valuation dates at the time of award and the use of hindsight information is an important element to prevent opportunistic takings. We have witnessed in the last years, before the 2008 downturn on the oil price, several oil rich countries imposing extra taxes or royalties on oil producing companies or forcing them to renegotiate their contracts so as to produce an increase in government's overall take.⁴⁵

that might have increased or decreased the value of the shares;" which has been interpreted by some authors as a recommendation to exclude hindsight information). This view implies that, if the firm suffered an increase in value after the nationalization events, the investor was not fully compensated according to the *Chorzów Factory* principle. *Id.*

45. Some examples of this behavior might be in order. In May 2006, VENEZUELA introduced an extraction tax that increased the royalty rate from 16% to 33% of the value of production at the wellhead. Later, in February 2007, Venezuela mandated that the national oil company (PdVSA) assume full operational control over the Orinoco Belt and other oil projects. See Official Gazette No. 38.443, May 24, 2006, "Ley de Reforma Parcial del Decreto 1.510 con Fuerza de Ley Orgánica de Hidrocarburos." See also, Official Gazette No. 38.632, February 26, 2007, "Decree No. 5.200." In ECUADOR, the Government issued Law 2006-42 in April 2006 introducing a 50% state participation over all revenues obtained due to oil prices increase since the time of contract not explained by CPI. This government take was further raised to 99% in October 2007 by Decree 662. See Law 2006-42 dated on April 25, 2006 and Decree 662 of October 18, 2007. ARGENTINA introduced export taxes for crude oil in March 2002 at a nominal rate of 20%. The tax was increased on May 11, 2004 to a nominal rate of 25%. On August 4, 2004, the Government implemented a further increase in export taxes on crude oil. Depending on the international price of crude oil, the nominal rates of export taxes ranged from 25% to 45% up to the end of 2007. Finally, in November 2007, the Government raised crude oil export rates, which resulted in imposing a maximum price of \$ 42 per barrel. See Decree 310/2002, Ministry of Economics Resolution 532/2004 and Ministry of Economy and Production Resolution 394/2007. In KAZAKHSTAN, see Hotten, *supra* note 12 (reporting on the correlation between the rise of crude oil prices and Kazakhstan's review of oil revenue agreements).

We advocate the use of ex-post information *in this type of damage analysis* so as to allow panels to measure the extent of economic windfalls, if any, taken by States or damaging parties that might have acted opportunistically and thus to include such windfall, *if appropriate*, in claimant's compensation.

A. EXAMPLE OF THE IMPORTANCE OF HINDSIGHT INFORMATION

This Section focuses on a numerical example that shows how the decision whether or not to use hindsight information affects the level of compensation in cases involving assets with significant price fluctuations. In turn, the example shows how the lack of use of hindsight information may leave opportunistic behavior that changes the original terms of the business arrangement undeterred.

Let us consider as an hypothetical example (see Figure III), a crude oil company that has signed a thirty-year agreement by which it could sell the crude oil it extracted at free market prices with no interference from oil-specific taxes, and subject to certain investment obligations. This hypothetical contract is signed in the mid-nineties, when the price of WTI was slightly below \$20 per barrel. Then, in 2004, just when the WTI soars to \$40 per barrel, the Government imposes an illegal 50% tax on crude oil.

FIGURE III: HYPOTHETICAL EXAMPLE OF THE
IMPACT OF ILLEGAL TAX

	2003	2004	2005	2006	2007	2008	2009
WTI Price (\$ per barrel)	20	40	50	60	100	140	50
Tax	0%	50%	50%	50%	50%	50%	50%
Claimants (\$ per barrel)	20	20	25	30	50	70	25
Government (\$ per barrel)	0	20	25	30	50	70	25

In 2006, the WTI price jumps to around \$60 per barrel. A year later, the WTI price further increases to \$100 per barrel, and during 2008, it peaks at \$140 per barrel to drop suddenly to \$50 per barrel in early 2009. See the hypothetical evolution of prices in Figure III. The questions presented by these facts include what price should we use to determine the compensation in order to restore the position that claimant would have today in the absence of the tax? At what date

should we value damages? Should we use hindsight information, and if so, how?

Some creative defense positions would argue that the pre-tax value to claimant should be assessed using pre-tax information just prior to the measure, whereas the post-tax value should use post-tax information immediately after the measure. This “vanilla” before vs after damage valuation approach often leads to absurd results. Using our example, this approach would compute the pre-tax value using the WTI just prior to the tax, which is \$20 per barrel, so that before the tax claimant would have a value of \$20 per each barrel sold. In the “immediately-after-tax” situation, it also receives \$20 per barrel sold, as at a price of \$40 per barrel, the Government keeps half of that amount in taxes, and the other half (\$20 per barrel) is kept by claimant. Therefore, this (invalid) approach would arrive to the absurd result that compensation ought to be zero.

An alternative approach attempts also to assess damages at the date of the taking, in 2004, neglecting the use of hindsight information altogether, but using a “but-for vs actual” approach, as opposed to a “before vs after” analysis. This approach would ignore any increase in WTI prices beyond 2004 and will result in a damage of \$20 per barrel plus prejudgment interest, as in the *but-for* situation a 50% tax, evaluated when the price of crude oil is at \$40 per barrel in 2004, has produced the effect of reducing the value to claimant in \$20 per barrel as of that time.

However, notice that a compensation that ignores how reality has evolved after the introduction of the tax would not make claimant whole in the sense of *Chorzów* principles. Clearly, a compensation at \$20 per barrel as of 2004 plus interest would not restore what claimant would have had as of today (2009), for example, in the absence of the tax, given WTI prices of \$50 per barrel. If the investor were to sell its assets today, it would be receiving a value commensurate with a net (after-tax) price of \$25 per barrel plus a \$20 per barrel compensation value plus interest. This amount, at roughly \$45 per barrel plus interest would be lower than the value it would receive in the absence of the tax, as of today, if claimant had sold its

assets at a price of \$50 per barrel. Thus, the investor would have not been fully compensated.⁴⁶

The government, however, would have benefited from this award, as it is mandated to compensate only at \$20 per barrel plus interest and yet since 2004 it collected taxes at a higher than \$20 per barrel for all years but 2004 (see Figure III). Clearly, ignoring hindsight does not seem to do justice in this case.

In addition, neglecting hindsight also neglects the fact that just one year earlier to the date of the award (*i.e.*, in 2008), the investor could have sold its assets when the WTI price was \$140 per barrel. How do we value such opportunity lost? Using hindsight information therefore is needed for two reasons, one to assess the actual position that claimant would have been today in the absence of the damaging measure and second, to more accurately evaluate actual damages as evolved in reality, since the date of the taking to the date of award. In volatile environments such as oil and gas, a compensation based on a fair market valuation at the most recent date (plus actual losses since the date of introduction of the tax) would leave the investor whole under the *Chorzów Factory* principle of restoration.

V. PRE-JUDGMENT INTEREST RATES

When a valuation date is chosen at a date that is far apart in time from the date of the award, the selection of the pre-judgment plays a central role in the amount of compensation. A wrong interest rate could result in a monetary award that does not fully restore the position of the damaged party in the absence of the measures.

Consider, for instance, the oil and gas example discussed above. In 2004 the tax took away half of the revenues of the investor when the price of crude oil was \$40 per barrel. Suppose for simplicity that production was ten million barrels a year so that revenues were \$400 million and that, due to the new tax, 50% of that amount (\$200 million) was taken by the government. Assume there is a similar production level in 2005. Given that prices went up to \$50 per barrel in that year, the amount taken by the tax is now \$250 million (\$50

46. Similar conclusion would be reached had we compare the proposed compensation to the price the claimant could have sold for in prior years, such as 2008, 2007 or 2006, for instance.

per barrel times 100 million barrels times 50% tax rate). Suppose, now, that by 2006 there is no longer a tax in force, and that claimant submits a request for arbitration in that year. By 2008, a panel has found that the government is liable and has to reach a decision on damages.

The nominal amount of the taking is clearly \$450 million (\$200 million taken in 2004, \$250 million in 2005).⁴⁷ If the valuation date is set as of 2004, a damage expert would discount the \$250 million lost in 2005 at a discount rate equal to the cost of capital of the industry, say at 10%. Then, damages as of 2004 would be \$427.27 million (\$200 million plus \$250 million discounted at 10%, for one year).

The award, however, is payable in currency as of 2008. The panel, then, could well rule that damages as of 2004 are \$427.27 million and that pre-judgment interest must be computed at a certain rate. Let us assume the Panel rules that interest rate must be set at an ad-hoc compounded rate of 5%. Claimant would then receive an award worth \$519.35 million (\$427.27 million plus compounded interest at 5% per year for four years) in 2008. Is claimant fully compensated? Let us examine what the theory and practice says about the level of pre-judgment interest rate for these cases.

Unfortunately, there is no established academic consensus as to the selection of the pre-judgment interest rate and this is true not only for international arbitration but also for U.S. litigation cases. This lack of consensus is predictably reflected in tribunals' decisions, which have granted pre-judgment interest rates using a variety of different criteria, or even granted no interest at all.⁴⁸

47. For the sake of simplicity, I am ignoring here applicable income taxes as well as changes in costs that might be related to revenues.

48. Compare *Enron Corp. v. Argentina*, Award, ICSID Case No. ARB/01/3, ¶ 452 (May 22, 2007), available at <http://ita.law.uvic.ca/documents/Enron-Award.pdf> ("once the amount of damage and compensation has been determined at a given date it is more appropriate that such amount should bear interest as from such date. Moreover, any risk of double jeopardy is thereby avoided"); *with* *Corfu Channel (U.K. v. Alb.)*, 1949 I.C.J. 4, 10 (Dec. 15) (omitting interest from the amount of compensation, and setting a fixed amount due from Albania to the United Kingdom).

A. INTEREST BASED ON THE BORROWING RATE OF RESPONDENT

Professors Patell, Weil, and Wolfson, on the other hand, have proposed using the respondent's unsecured borrowing rate under the so-called coerced loan theory,⁴⁹ an idea that is advocated by Knoll and others in the international arbitration arena.⁵⁰

This coerced loan view works as follows. Suppose there is a finding that the respondent caused \$10 million in damages at an earlier date (i.e., the valuation date). The damaged party should have had an additional \$10 million during the time since the valuation date. However, respondent used the deprived \$10 million, so the situation can be made tantamount to an involuntary loan. Thus, if this can be viewed as a loan, then the pre-judgment interest rate is the unsecured borrowing rate that respondent would pay to borrow the \$10 million amount. However, note that this approach, by focusing the attention on respondent's cost of borrowing rather than on the damaged party's opportunity cost for its deprived \$10 million, does not necessarily result in full compensation, as it might fail to restore the damaged party to the appropriate position. The damaged party would have rather used the \$10 million in its own business and earn a return on it, rather than having been forced to loan it to the damaging party, for which the injured party has to bear collection risks that it did not intend to assume. In fact, to the extent that respondent's cost of borrowing is lower than the damaged party's

49. James M. Patell, Roman L. Weil & Mark A. Wolfson, *Accumulating Damages in Litigation: The Roles of Uncertainty and Interest Rates*, 11 J. LEGAL STUD. 341, 362 (1982) (instructing that the rate should reflect both the extent to which the plaintiff was forced to alter his consumption and investment plan and the possibility that the plaintiff bore risks which differed from those inherent in his undamaged position).

50. See Jeffrey M. Colón & Michael S. Knoll, *Prejudgment Interest in International Arbitration*, 4 TRANSNAT'L DISPUTE MANAGEMENT 1, 10-11 (2007) (noting that this method acts as though the damage caused by the respondent is actually a forced borrowing); see also Michael S. Knoll, *A Primer on Prejudgment Interest*, 75 TEX. L. REV. 293, 352-54 (1996) (explaining the proper method as discounting "future damages to the date of injury using a discount rate appropriate for the project and then [calculating] prejudgment interest on that award using the defendant's cost of unsecured borrowing.").

return on its business, the compensation is not sufficient to repair the harm done by the taking.⁵¹

B. RISK-FREE INTEREST RATES

Another view, offered by economists like Professor Fisher, is that the prejudgment interest rate should be based on a risk-free rate, typically the rate on short-term government securities (such as U.S. Treasury bills).⁵² This approach seems appropriate as long as the valuation is conducted at the time of expropriation and the deprived assets or cash flows are no longer subject to operating risks. If the damaged company is subject to operating risks or the legal theory of the claim is such that a current valuation date is called for, however, there are merits for a risk-adjusted rate.⁵³ This was clearly stated in a recent United States Federal Court decision in *CCA Associates v. United States*,⁵⁴ in which the respondent (the U.S. government) was arguing for a risk-free interest rate to bring cash flows forward to the date of the awards. However, the court rejected this idea as it found that, “[t]he government’s approach, however, does not adequately adjust the value of [CCA’s lost] cash flow stream to account for risk.”⁵⁵

51. The opposite will be true if the respondent’s cost of borrowing were to be higher than what claimant would have obtained as a return from its own business.

52. See Franklin M. Fisher & R. Craig Romaine, *Janis Joplin’s Yearbook and the Theory of Damages*, 5 J. ACCT. AUDITING & FIN. 145, 146-48 (1990) (noting that compensating the plaintiff at the rate it reasonably expected to earn on the destroyed asset is flawed because the plaintiff would be entitled to interest compensating it for “the time value of money . . . [but not] also entitled to compensation for the risks it did not bear.”).

53. See Roy J. Epstein, *Prejudgment Interest Rate in Patent Cases Don’t Compound an Error*, 24 No. 2 INTELL. PROP. L. NEWSL. (ABA Section of Intellectual Property Law, Chicago, Ill.), Winter, 2006, at 1, 9-10 (discussing the use of risk-adjusted pre-judgment interest rates other than the coerced loan theory).

54. 75 Fed. Cl. 170, 204 (2007), *aff’d in part and vacated in part*, 284 Fed. Appx. 810 (arguing that “a single, risk-free interest rate should be used to bring cash flows forward, not only to the date the taking ended or to the date the judgment is entered, but to the date the judgment is paid.”).

55. *Id.*

C. INTEREST BASED ON THE OPPORTUNITY COST OF THE LOST INVESTMENT

To overcome the risk of under compensation in the use of risk-free interest rates, some have advocated the use of the company's lost return, so as to reflect the opportunity cost of the deprived cash flows or moneys to the damaged party.⁵⁶ The main logic here is that in the absence of the damaging actions, the damaged party would have had additional money in the past that it in fact did not have. The damaged party would have used that additional money in its business, and would have earned a prudent⁵⁷ return on those funds, which could be measured by some historic measure of the company's performance, or more conservatively, by its average cost of capital or WACC.

In principle, to fully repair the damage, the selection of the proper pre-judgment interest rate should be linked to the risk that the damaged party was exposed to during the time of valuation and the time of the award, in line with the opportunity cost of the deprived money (i.e. cash flows). The interest rate would thus need to be related to the investment alternatives of the damaged party.

According to the subjective valuation approach, the determination of the rate of interest, its duration and the question of compounding should be based on the concrete financial situation of the injured person. If, for example, a loan was taken in order to bridge the period without the money, it is evident that the interest actually paid becomes the measure of damages. If the taking of a loan was not necessary because the injured person had enough money at

56. See John C. Keir & Robin C. Keir, *Opportunity Cost: A Measure of Prejudgment Interest*, 39 BUS. LAW. 129, 147 (1983) (noting that one way the opportunity cost of not having been paid damages will be reflected in the cost to the firm of borrowing money).

57. See, e.g., *Harris Trust & Sav. Bank v. John Hancock Mut. Life Ins. Co.*, 122 F. Supp. 2d 444, 464 (S.D.N.Y. 2000), *aff'd in part, rev'd in part*, 302 F.3d 18 (2d Cir. 2002) (finding that, in relation to an alleged deficiency in assets in a retirement trust, in the absence of damages, the trust would have reinvested the lost funds in the same fashion as the rest of its portfolio and thus it used the trust's actual overall rate of return as the equivalent of the pre-judgment interest rate). A prudent investor would have invested the funds to produce a reasonable return while maintaining safety of principal. A prudent investor should earn, on average, a return equal to its cost of capital. The investor, of course, could have factually earned a return on the damaged company that is higher or lower than the cost of capital, or WACC.

his or her disposal, one has to consider that he or she could have used or invested the money otherwise. It is therefore decisive to identify the available investment alternatives of the injured investor in order to achieve full reparation.⁵⁸

Indeed, in the recent international arbitration decision of *Vivendi v. Argentina*, the Tribunal recognized a pre-judgment interest rate that conceptually represented a “reasonable proxy for the return Claimants could otherwise have earned on the amounts invested and lost in the Tucumán concession.”⁵⁹ Claimants in this case had asked for a 9.7% interest rate, equal to the cost of capital at which cash flows were discounted in their DCF valuation analysis.⁶⁰ The Tribunal, however, possibly looking at the fact that Vivendi’s Aguas del Tucumán was not such a great business to be in, granted only a 6% interest rate, arguing, “[t]he Tribunal is not persuaded that claimants would have earned 9.7%.”⁶¹ In doing so, this Tribunal realized that the pre-judgment interest rate at which Vivendi’s damages should be brought forward from a valuation date that is ten years apart from the date of the award is not a risk-free interest rate, but rather, an interest rate that must reflect the opportunity cost of the lost invested amounts.⁶²

One criticism counseling against this approach is that awarding the damaged party an interest rate equal to its cost of capital will create a moral hazard problem, as there could be an incentive for the damaged party to delay the arbitration so as to earn, safely, a risk-adjusted return.⁶³ However, although this argument has some

58. See Marboe, *supra* note 37, at 754 (footnote omitted) (reporting that “the United States-Iran claims Tribunal developed this concept in *Sylvana Technical Systems*, holding that interest should be calculated on the basis of the investment alternatives of the Claimant.”). Other United States-Iran cases followed the same line of reasoning. *Id.*

59. *Compañía de Aguas del Aconquija S.A. v. Argentina*, Award, ICSID Case No. ARB/97/3, ¶ 9.2.8 (Aug. 20, 2007).

60. See *id.* ¶ 9.2.7 (noting that the rate would correspond to the “discount rate applied to Claimants’ DCF analysis and the quoted rate on the Argentine Treasury bond.”).

61. See *id.* ¶ 9.2.7-.8 (speculating that claimants would not earn that interest on their respective shares of damages awarded had such sums been timely paid at the date of Argentina’s expropriation of the concession).

62. *Id.* ¶ 9.2.8.

63. See Epstein, *supra* note 53, at 9 (adding that this could frustrate the process

foundation for cases in which there are outright takings and the damaged party is no longer operating the asset, it does not hold well when the damage is partial and the damaged party is (or was) foregoing a return on the deprived cash flows while operating the asset (and thus subject to its business risks).

In most oil and gas cases where damages may arise from partial takings or increases in taxation by government, the issue of the appropriate pre-judgment interest rate then becomes critical. In our example above, granting \$519.35 million based on an ad-hoc 5% pre-judgment interest rate may well result in low compensation if the damaged party could have used the \$450 million that was taxed away in their own oil business. The cost for the oil company to substitute the \$450 million that was lost was exactly equal to the cost of capital of sourcing funds to the damaged company, in our example 10%. The cost of capital is nothing but the WACC.⁶⁴ Using the WACC in cases of partial damages would provide the oil and gas investor an interest compensation that, *on average*, is equal to the cost of sourcing capital in its industry, and thus, *on average*, this compensation should restore the opportunity cost of money in its business.

CONCLUSIONS AND RECOMMENDATIONS

This Article argues that in the oil and gas industry, given the large swings in crude oil prices, arbitration cases are likely to take place because of opportunism as parties (in particular States), may want to change long-term contractual arrangements to their favor when there are unexpected turns on crude oil prices. This is exacerbated when the main investments at the exploration stage are already undertaken, reserves are proven, and thus large investments are already sunk. The temptation to alter the pre-established commercial arrangements for

of litigation and limit settlements).

64. Notice that given the volatility of crude oil prices, granting a pre-judgment rate based on the WACC will not necessarily coincide with the actual returns that the company could have made on the non-deprived cash flows. If by 2006 crude oil prices tripled as compared to 2004, then a prejudgment interest rate at the WACC would still fall short of restoring the situation of the investor had it not been taxed. On the contrary, if by 2006 crude oil prices went down significantly, granting the WACC could result in an award of which the investor turned out to be better off had it reinvested the deprived cash flows in the company.

exploitation of the discovered resources is higher, often resulting in sudden transfers of wealth among parties, and, as a consequence, in arbitration disputes.

Another common source of arbitration disputes in the industry arises from the fact that governments typically retain ownership and overall management responsibilities of the natural resources, as well as ample regulatory powers to introduce price controls or use energy prices as economic tools for redistribution policies, potentially altering the initial commitments and investor expectations prevailing at the time the contractual arrangements are made.

Several issues arise that are of predominant importance in estimating arbitration damage compensation in the international oil and gas industry. First, this Article highlighted the importance of selecting a damages method that appropriately accounts for uncertainty of the value of future revenues, either related to volatile crude oil prices or the extent of reserves. Among different alternatives, income-based approaches such as the DCF method are best suited to compute damages in this industry. Because oil and gas companies derive their primary value on the existence of reserves, rather than on the ability to develop and extract such reserves and later sell them to the market, the DCF is a suitable method even if the company subject to valuation lacks a record of historic profitability, a precondition that some panels consider a must-check before endorsing DCF estimates. Further, uncertainty about future cash flows can be assessed by making reasonable and informed judgments about key parameters that determine future revenues and costs (and thus cash flows), by using the proper risk-adjusted discount factor, and by undertaking sensitivity analysis to damage estimates.

Second, the choice of valuation date and the use of hindsight information play a relevant role in damage assessment, in particular when takings are temporary. Indeed, in these cases the “time of the taking,” which is usually chosen as the valuation date, is the full period during which the damaging action diminish the value of the asset, not the start of that period. It is thus more appropriate that either the valuation date for temporary takings be designated as the end of the takings period or, alternatively, to use hindsight information to account for the ongoing nature of the damaging actions if the valuation date is set at the start of the period when

measures begin. This Article illustrated a simple oil and gas example that explains that hindsight information, that is, events that transpired during the temporary takings period (such as an increase in the price of crude oil) have to be taken into account in both the but-for and actual scenarios for compensation to be full and appropriate, and in line with the traditional *Chorzów Factory* compensation principles.

Finally, the issue of pre-judgment interest rate is of utter importance. Although there is no established academic consensus as to the selection of the pre-judgment interest rate, it is important to recognize that in temporary takings, investors are still subject to the operating risks of the business, and that the deprived cash flows due to the damaging actions have an opportunity cost, which, on average, is equal to the cost of capital of sourcing funds to replace such flows. This cost of capital is best represented by the company's WACC. In the recent *Vivendi* decision, indeed the panel reasoned within this same conceptual line, even so the taking had become permanent, and articulated that the pre-judgment interest rate ought to be based on a reasonable proxy for the return that the damaged party could otherwise have earned on the amounts invested and lost due to the damaging actions. Applying this logic is likely to better comply with the principles of full compensation, as opposed to adopting ad-hoc interest rates.