

Assessing Damage under the Discounted Cash Flow Approach (DCF): Sound Tool or Speculative Method? A Swiss perspective

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Valuation is a prophecy as to the future. The DCF method, which has gained widespread application in business valuation and in claims for the assessment of damages in international arbitration, determines the value of a business by projecting the net cash flow for a certain time period into the future and then discounting it back – by applying a specific discount rate – to present value. Considering the difficulties involved in DCF methodology and DCF projections, the DCF method features inherent and inevitable approximations. Whether DCF computations and forecasts, which are highly sensitive to the assumptions used when applying the DCF formula, may constitute a sound tool for calculating damage under Swiss

law is not a foregone conclusion and will depend on the particularities of each case. The objective of the authors is not to argue for, or against, any particular valuation methodology. It is rather to determine whether Swiss law sets out countervailing or limiting principles which would lead both Swiss courts and arbitral tribunals applying Swiss law to decline to resort to a future earnings-based valuation method such as the DCF method in damage claims. In addressing these complex issues, the authors seek to adopt a pragmatic approach and try to provide tools in order to circumscribe the uncertainties inherent to the use of the DCF method in damage calculation under Swiss law.

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Introduction

The valuation of complex assets, such as business companies or real estate, is a science little understood by the legal community. Despite often being called upon to value assets which have an easily determinable market price, navigate capitalization tables or apply statistical methods (e.g. when assessing damage in the context of a tort claim), lawyers and tribunals are usually uncomfortable when it comes to placing a value on a company.

Valuation requires specialised knowledge, and the legal community frequently relies on experts who have a background in finance and accounting. The ability to assess the value of a company is not a simple task for legal practitioners, who nonetheless must either advocate (lawyers) or adjudicate (courts/arbitral tribunals) claims based on such assessments.

While various valuation methods are found in practice, this contribution will address the somewhat controversial use of the Discounted Cash Flow (here-

inafter: “DCF”) valuation method, which is one of the most commonly used methods in business practice.¹

The DCF method is regularly used – and also criticised – and has come to prevail in M&A transactions (corporate mergers, divisions, transfers of assets), acquisitions, real estate and international arbitration.²

In international arbitration, the DCF method is often employed as a means to assess damage/loss claims based on the value of a business. In the context of resolving disputes, state courts and arbitral tribunals use valuation methods in order to determine the compensation for the loss of an income-producing asset.³ Assessing a loss and determining how an alleged conduct harmed the future prospects of a business, *i.e.* the future streams of earnings, is inherently uncertain. As encapsulated by Lord Scarman, “[k]nowledge of the future being denied to mankind, so much of the award as it to be attributed to future loss and suffering [...] will almost surely be wrong. There is really only one certainty: the future will prove the award to be either too high or too low”.⁴ This fate does not, however, prevent a court from determining as precisely as possible the extent of a loss incurred by an individual.

In this respect, the DCF method, which calculates the present value of a business company, while at the same time projecting and discounting future cash flows over a certain period, is of special interest. Originally used by investment bankers when

valuing companies for capital market transactions or acquisitions, DCF computations have gradually been employed in disputes where a party claims to have incurred damage. However, using a method intended to enable a purchaser to link the investment he is willing to make with the profit which he may hope to get, in order to assess damage incurred by an individual,⁵ which is a normative process of assessment of a loss, raises interesting issues of principle.

It is important to emphasize that the topic of this article is not relevant when the method for setting the price and its possible reduction are contractually and expressly determined. The present article deals with all other situations, particularly when the contract is silent on the method to be applied with a claim for reduction of the price or for a loss of profit, typically for the breach of a joint venture where, most often, the parties do not provide for any specific calculation method.

This article will first address the concept of assessment of damage according to the Swiss Code of Obligations (hereinafter: “CO”). It will then discuss the mechanics of the DCF method and the risks associated with it. This article will finally seek to provide tools in order to circumscribe the uncertainties inherent to the DCF method and examine its use in damage calculation.⁶

I. The assessment of damage according to the Swiss Code of Obligations

1. The proof of damage and its calculation

1.1 Definition of damage

Case law defines damage as the involuntary decrease in net capital; it corresponds to the difference between the harmed party’s current amount of capital and the capital it would have had if the injuring event had not occurred. In other words, the damage is understood as the difference between the claimant’s

¹ There are numerous methods aimed at valuing a business company; for a presentation of some of these methods, see *Pascal Gantenbein/Marco Gehrig*, *Moderne Unternehmensbewertung, Bewertungsziel mit Methodenmix erreichen*, *Der Schweizer Treuhänder* 2007/9, 606 *et seq.* See also *Pierre Vermimmen/Pascal Quiry/Yann Le Fur*, *Finance d’entreprise*, Paris 2011, Chapter 37, 741–773.

² International investment arbitration regularly addresses matters such as compensation for expropriation by resorting to the DCF valuation method. It is accordingly a fruitful source for examples. International commercial arbitration cases also address valuation issues, and in particular the DCF method, for instance in disputes involving joint-ventures investors.

³ *William Knull III/Scott Jones/Timothy Tyler/Richard Deutsch*, *Accounting for Uncertainty in Discounted Cash Flow Valuation of Upstream Oil and Gas Investments*, 25 *Journal of Energy and Natural Resources Law*, Special Issue on Energy and Natural Resources Disputes and their Resolution, Vol. No. 3, 2007, 268.

⁴ *Lim Poh Choo v. Camden and Islington Area Health Authority* [1980] AC 174.

⁵ On the issue of the normative process of assessment of damage, see *Benoît Chappuis*, *Quelques dommages dits irréparables. Réflexions sur la théorie de la différence et de la notion de patrimoine*, SJ 2010 II 165, N 57 *et seq.*

⁶ On these issues, see also *Benoît Chappuis*, *Le calcul du dommage selon la Discounted cash flow method (DCF): vers un calcul abstrait?*, in: *Liber amicorum Roland Brehm*, Berne 2012, 65 *et seq.*

would-be economic position in the absence of the wrongful conduct, and the claimant's actual position. This decrease can derive from a loss suffered as well as a loss of profits.⁷

1.2 The general principles on the proof of damage

The party seeking to enforce a right or succeed in a claim must provide a court with material proof of the damage. This rule is enshrined in the saying "*Actori incumbit probatio*" (literally: "on the plaintiff rests the proving").⁸

While Article 8 of the Swiss Civil Code (hereinafter: "CC") provides that a party, unless otherwise stated by law, shall prove the facts which give rise to its right of claim, Article 42 (2) (CO) states that when the exact amount of damage cannot be established, the court will assess its *quantum* by taking account the normal course of events and the measures taken by the harmed party. Read together, these provisions fix the burden of proof on the harmed party seeking compensation. The plaintiff must prove both the existence and the amount of its loss in a sufficiently determined and concrete manner in order to prevent the dismissal of its claim.⁹ The Federal Supreme Court has adopted an increasingly strict approach regarding the precise assessment of a claim ("*Substanziierungs-*

pflicht") of damage suffered by an aggrieved party and the proof that it must produce.¹⁰

1.3 The role of Article 42 (2) CO

Article 42 (2) CO is a rule that lightens the plaintiff's burden of proof when difficulties arise in establishing its loss. It is indeed plausible that the nature of a loss makes its exact calculation or proof very difficult, if not impossible. Article 42 (2) CO covers not only the amount of damage, but its mere existence. As the Federal Supreme Court has upheld, this provision gives a court discretionary power to conclude that damage has been proven even where such has not exactly been done. While Article 42 (2) CO lightens the burden of proof on the harmed party under specific conditions, it does not eliminate it.¹¹ The fact that the injuring effect of a liable act is difficult to establish does not modify the rules on the burden of proof.¹² Article 42 (2) CO is neither a facilitating solution nor a gift ("*oreiller de paresse*") for the plaintiff. Put simply, a plaintiff must collect the evidence at its disposal.¹³

2. Future damage and its compensation

Current damage is damage that has already occurred as of the date of the judgement of the cantonal court of last resort. A future damage is that which occurs after such a judgement is made. The law expressly provides for compensation for a future damage in Article 46 (1) CO in cases of personal injury; the fact that this principle of compensation for future damage is a rule also in the field of contract liability is not challenged.¹⁴ No distinction should be made

⁷ ATF 129 III 331, c. 2.1; 129 III 18, c. 2.4; 128 III 22, c. 2e/aa; 127 III 73; 120 III 423; BK-*Brehm*, CO 41 N 70; *Benoît Chappuis*, Le moment du dommage, Analyse du rôle du temps dans la détermination et la réparation du dommage (cited: Moment du dommage), Zurich 2007, N 29 *et seq.*; CR-*Werro*, CO 41 N 8; *Heinrich Honsell*, Schweizerisches Haftpflichtrecht, 4th ed., Zurich 2005, N 27; BSK-*Schnyder*, CO 41 N 6.

⁸ *Guy Robin*, La réparation du préjudice contractuel dans le commerce international, RDAI/IBJL, N° 5, 2010, 439.

⁹ ATF 127 III 365, c. 2b; 115 II 187; TF 4A_306/2009, c. 6.1; 5A_336/2008; 4C.82/2006, c. 3.4; 4C.48/2005; *B. Chappuis*, Moment du dommage (n. 7), N 75; *François Chaix*, La fixation du dommage par le juge (article 42 al. 2 CO), in: Le préjudice, une notion en devenir, 2004, Journée de la responsabilité civile, Zurich 2005, N 7; *Jürgen Brönnimann*, Die Behauptungs- und Substanziierungslast im schweizerischen Zivilprozessrecht, Thesis, Berne 1989, 14, 36 and 197 *et seq.*; *Sabine Burkhalter Kaimaliotis*, Die Substanziierungslast – insbesondere gemäss der Zürcher Zivilprozessordnung und der Praxis des Bundesgerichts, AJP 2007 1263, 1264; *Peter Forstmoser*, Die aktienrechtliche Verantwortlichkeit, Zurich 1987, N 161; *Hans Peter Walter*, Prozessuale Aspekte beim Streit zwischen Kunden und Vermögensverwalter, ZSR I 2008 112.

¹⁰ ATF 127 III 365, c. 2b; TF 4A_306/2009, c. 6.1; 5A_336/2008; 4C.82/2006, c. 3.4; *Walter* (n. 9), 112 *et seq.*

¹¹ ATF 122 III 219, c. 3a; 99 II 226, c. 3b; BK-*Brehm*, CO 42 N 52.

¹² Handelsgericht des Kantons Zürich (6 November 1998), ZR 100 (2001) N 31, 97, in particular 106; *B. Chappuis*, Moment du dommage (n. 7), N 79.

¹³ ATF 129 III 135, c. 2.3.2.1; 122 III 219, c. 3b; 98 II 37, c. 2; 97 II 118, c. 1; TF 4C.160/2001, c. 2/d/bb; BK-*Kummer*, CC 8 N 70 and 245; *Henri Deschenaux/Pierre Tercier*, La responsabilité civile, Berne 1997, 209 N 21; BK-*Brehm*, CO 42 N 48 and 63.

¹⁴ ATF 114 II 253 = JdT 1989 I 333, c. 2a; CR-*Werro*, CO 42 N 18 and 27; *Deschenaux/Tercier* (n. 13), 228 N 13; *B. Chappuis*, Moment du dommage (n. 7), N 276 *et seq.*; *Chaix* (n. 9), N 51.

between current and future damage. Both have an identical nature, the only difference being the moment at which the losses arise. The principles for calculating those losses are nevertheless the same.¹⁵

Future damage must be foreseeable with the same degree of certainty as current damage.¹⁶ In other words, damage that does not exist at the moment of the judgment may be compensated provided it is foreseeable.¹⁷ It is not enough that the damage to come is a mere prospect¹⁸ or future possibility.¹⁹ While future damage is compensated, damage that is merely hypothetical is not.²⁰ Accepting the principle of compensation for future damage, the Federal Supreme Court stated that Federal law requires damages awarded to a victim to be calculated at a discounted rate.²¹ Such a discount aims at reducing the advantage that the harmed party takes from the immediate disposal of capital intended to compensate damage that will only occur in future. It is the opposite of the role of late payment interest that intends to compensate for the lack of capital during a given period of time.

In M&A arbitration, while it is relatively easy to calculate and prove compensatory claims and expenses made in view of a contemplated transaction, the standard of proof is more stringent and the calculation much more complex since the harmed party must adequately substantiate and document the profit it would have made had the transaction not failed.²²

3. Methods for the assessment of damage

3.1 The concrete method

The Federal Supreme Court has consistently stated that damage must be in principle calculated ac-

ording to the subjective method, *i.e.* the assessment of the loss concretely incurred by the victim.²³

3.2 The abstract method

The concrete calculation principle has some exceptions. For example, a court may use the abstract method if a concrete evolution of the future damage is particularly difficult to establish.²⁴ While Federal law does not generally prohibit the abstract method of calculating damage,²⁵ the concrete method should be preferred every time it is serviceable. On the other hand, resort may be made to the abstract method when the particular circumstances of the case so require. Nevertheless, some scholars are of the view that the concrete method is not imposed as a default method of calculation.²⁶

3.3 The use of tables and statistics in the abstract method

One way to assess a future damage according to the abstract method consists in using tables or statistics.²⁷ The assessment of lost profits by means of capitalization tables and the valuing of an automobile on the basis of a *used car prices blue book*, used widely by the courts, constitute abstract calculation approaches.²⁸ A statistical method is recommended

¹⁵ TF 4C.324/2005, c. 3.2.

¹⁶ CR-Werro, CO 42 N 18; Pierre Engel, *Traité des obligations en droit suisse: dispositions générales du CO*, Berne 1997, 473.

¹⁷ ATF 116 II 441, c. 3aa = JdT 1991 I 166.

¹⁸ TF 4C.114/2006, c. 5.3.2.

¹⁹ ATF 122 III 219, c. 3a; 99 II 226, c. 3b; 116 II 441, c. 3aa; TF 4C.114/2006, c. 5.1; 4C.184/2005; CR-Werro, CO 42 N 18 and 27; B. Chappuis, *Moment du dommage* (n. 7), N 278; Engel (n. 16), 473.

²⁰ ATF 129 III 18, c. 2.4; 82 II 40; TF 4C.114/2006, c. 5.1.

²¹ ATF 127 III 73, c. 6b = SJ 2001 I 397.

²² Georg von Segesser, *Arbitrating Pre-Closing Disputes in Merger and Acquisition Transactions*, in: *Arbitration of Merger and Acquisition Disputes*, ASA Special Series No. 24, 2005, 51.

²³ As regards concrete computations ("calcul concret"), see ATF 131 III 360, c. 5.1; 117 II 609, c. 9; 113 II 345, c. 1a; 99 II 214, c. 3a; 89 II 219; TF 4C.184/2005, c. 4.3.1; Handelsgericht des Kantons Zürich (6 November 1998), ZR 100 (2001), 97, N 31; B. Chappuis, *Moment du dommage* (n. 7), N 78. Cf. également CR-Werro, CO 42 N 6 and 7; BSK-Schnyder, CO 42 N 2; Karl Oftinger, *Schweizerisches Haftpflichtrecht I*, Zurich 1995, N 189.

²⁴ ATF 120 II 296, c. 3b; B. Chappuis, *Moment du dommage* (n. 7), N 36 and 283; Marc Schaezle/Stephan Weber, *Manuel de capitalisation*, 5th ed., Zurich 2001 (traduction française de *Fernand Cerf*), 355.

²⁵ ATF 120 II 296, c. 3b.

²⁶ Vito Roberto, *Schweizerisches Haftpflichtrecht*, Zurich 2002, N 673: "Entgegen der in der Literatur vertretenen Ansicht ist die konkrete (bzw. subjektive) Schadensrechnung nicht selbstverständlich."

²⁷ Franz Werro, *La responsabilité civile*, Berne 2011, N 1082; Pierre Wessner, *L'indemnisation du dommage patrimonial résultant de l'invalidité chez les jeunes lésés*, in: Franz Werro (ed.), *Le temps dans la responsabilité civile* (Colloque du droit de la responsabilité civile 2005, Université de Fribourg), Berne 2007, 153; Alfred Keller, *Haftpflicht im Privatrecht*, tome II, 2nd ed., Berne 1997, 27.

²⁸ Werro (n. 27), N 1082; Roberto (n. 26), N 673.

by scholars who see in it both a more simple way to calculate future damage and a result that is fairer than simply considering the concrete circumstances of the case.²⁹ This applies for example to the assessment of the loss of support.³⁰ According to some scholars, a statistical approach often results in a presumption that must be overcome by the party challenging its validity and accuracy.³¹

This being said, the use of statistics does not imply an uncontroverted result. A court must assess their relevance and consequences in the calculation of a given compensation. The acceptance of the *Stauffer/Schaetzle* tables – tables most frequently used in the quantification of personal damage – has been a long process (initiated by judgment ATF 77 II 40 followed by ATF 81 II 38). In this latter decision, the Federal Supreme Court stated that it was not possible to undertake systematic calculations on the basis of tables without having serious probabilities supported by Swiss statistics which effectively establish the average professional life in Switzerland.³² In the same way, limited acceptance was given in case law to the “Swiss Survey of Active Labour Population (EPSA)”, undertaken by the Federal Bureau of Statistics in 1997, and its possible use in determining household damage.³³ Even if some authors currently support the codification of provisions on damage that could lead to higher degrees of abstraction,³⁴ case law currently holds that a court must make sure that there are similarities between the factual circumstances that are the basis for the provided statistics and those of the concrete case.³⁵

Accordingly, this “supposes that the tribunal explains the extent to which such statistics correspond more or less to the particular case”.³⁶ If necessary, some adjustments should be made based on the actual circumstances.³⁷ The Federal Supreme Court has accordingly refused to abstractly calculate the value of damage caused to a tree, the life expectancy of which was underestimated by the use of directives and tables established by specialized institutes in this field. The Federal Supreme Court instead proceeded to a concrete calculation of the damage.³⁸ Similarly, on the issue of awarding compensatory interest higher than the statutory interest of 5% (Articles 73 (1) and 104 (1) CO), the Federal Supreme Court stated that it is for the plaintiff to provide concrete proof of a higher damage and that it was “not possible to do so abstractly, for example, by means of stock market indicators”.³⁹ A court must also make sure that it does not give particular weight to a particular future event – for example death – which the tables already take into account.

Schaetzle/Weber further highlight that “the use of abstract data is only justified if the damage cannot be concretely calculated [...]. Damage must be calculated concretely if this is possible and abstractedly only when necessary”.⁴⁰

The mathematical, statistical or actuarial instruments remain tools; the forecast remains the court’s prerogative and is within its discretion. It should be noted that the use of tables and statistics means entering into the field of hypothetical causality: such causality is also taken into consideration every time future damage over a certain period is calculated using statistical tables. In this way, we take into consideration a hypothetical causality of an event that will contribute to the damage, *i.e.* the future occurrence, determined and established in a statistical manner.⁴¹

²⁹ *Marc Schaetzle*, Bundesgericht, BGer 4C.222/2004 vom 14.9.2004. Lehren aus einer komplexen Schadensberechnung, HAVE/REAS 2005, 46, 53 (ch. 9).

³⁰ *Wessner* (n. 27), 152–153; *Luc Thévenoz*, La perte d’une chance et sa réparation, in: Franz Werro (ed.), Quelques questions fondamentales du droit de la responsabilité civile: actualités et perspectives (Colloque du droit de la responsabilité civile 2001, Université de Fribourg), Berne 2002, 254; *BK-Brehm*, CO 42 N 56a.

³¹ *Stephan Weber/Marc Schaetzle*, Zeit ist Geld oder der unterschätzte Einfluss des Rechnungstages auf die Schadensberechnung, HAVE/REAS 2004, 97, in particular 111 (V.2).

³² ATF 81 II 38, c. 2.

³³ ATF 129 III 135 = JdT 2003 I 511.

³⁴ On this question, *Guy Chappuis*, Le préjudice ménager: encore et toujours ou les errances du dommage normatif, HAVE/REAS 2004, 283.

³⁵ ATF 129 III 135, c. 4.2.2.1 = JdT 2003 I 511.

³⁶ ATF 129 III 135, c. 4.2.2.1; TF 4A_98/2008, c. 3.1; 4C.166/2006, c. 5.2.

³⁷ ATF 129 II 145, c. 3.1; TF 4C.166/2006, c. 5.2.

³⁸ ATF 127 III 77; approach upheld by *Roberto* (n. 26), N 682.

³⁹ TF 4C.459/2004 = SJ 2005 I 557.

⁴⁰ *Schaetzle/Weber* (n. 24), 355.

⁴¹ *BK-Brehm*, CO 41 N 149g; *B. Chappuis*, Moment du dommage (n. 7), N 291.

II. The DCF method and its use in the damage calculation

1. Rationale and mechanics of valuation methods

1.1 Value and market value

One of the core issues in many business investment disputes is determining whether and how an alleged conduct influenced the future stream of earnings of that business.⁴² In this regard, the market value⁴³ of the property must be determined.⁴⁴ The concept of market value is also important in M&A transactions as it assists parties in determining the price of a contemplated transaction.⁴⁵

As the International Valuation Standard Council (IVSC) notes, “business valuations are commonly sought and performed on the market value basis of valuation”⁴⁶. Market value measures the value of the business between a willing and able hypothetical seller and a willing and able hypothetical buyer.⁴⁷ Market value is therefore defined as the estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm’s-length transaction after proper

marketing, wherein the parties had each acted knowingly, prudently and without compulsion.⁴⁸

This definition leaves open the question of the appropriate valuation method to use in order to determine accurately the price of an asset.⁴⁹ In this respect, valuation should serve to determine the market value of an investment.⁵⁰

1.2 Basic valuation approaches

There is no single valuation method that applies in all cases and scenarios. This raises the question of selecting a method that is appropriate in each particular case.

Three main approaches are commonly accepted when valuing a company:⁵¹

- Income-based approach (like the DCF method), using methods that convert anticipated economic benefits into a single present value amount. The DCF method is essentially applied to estimate the anticipated profits perceivable in the future of a certain going concern;⁵²
- Market-based approach, which establishes the value of an asset by comparing it to similar assets sold on the open market;⁵³ and
- Asset-based approach (book value, replacement value, liquidation value or net asset value, adjusted net book value/Substanzwert), using meth-

⁴² Mark Kantor, *Valuation for Arbitration: Compensation Standards, Valuation Methods and Expert Evidence*, Alphen aan den Rijn 2008, 7.

⁴³ A large number of international investment treaties refer to “Fair Market Value” (FMV), without defining it, as a measure of compensation. Since Fair Market Value is often used interchangeably with Market Value even though these terms have distinct definitions, we will use the term Market Value in this contribution.

⁴⁴ Louis Wells, *Double Dipping in Arbitration Awards? An Economist Questions. Damages Awarded Karaha Bodas Company in Indonesia*, 19 *Arb. Int.* 2003, 471, 473. Reliance upon Market Value is not without critics. See for example the dissenting opinion of Professor Ian Brownlie in *CME Czech Republic B.V. (The Netherlands) v. Czech Republic*, UNCITRAL, Final Award, Separate Opinion by Ian Brownlie, 14 March 2003, N 72 and 79; see also *Sergey Ripinsky/Kevin Williams*, *Damages in International Investment Law*, British Institute of International and Comparative Law, London 2008, 375.

⁴⁵ Wolfgang Peter, *Arbitration of Mergers and Acquisitions: Purchase Price Adjustment Arbitrations*, ASA Special Series No. 24, 2005, 56.

⁴⁶ IVSC, *Guidance Note GN 6 on Business Valuation (International Valuation Standards*, 8th ed., 2007).

⁴⁷ Kantor (n. 42), 32; for the process of defining the price in M&A transactions, see Peter (n. 45), 55 *et seq.*

⁴⁸ Kantor (n. 42), 31.

⁴⁹ *Ripinsky/Williams* (n. 44), 186.

⁵⁰ In *Compania de Aguas del Aconquija S.A. and Vivendi Universal S.A. v. Argentine Republic*, ICSID Case No. ARB/97/3, Award of 20 August 2007, the arbitral panel misused the term “Fair Market Value”, by resorting to a non-market measure (“historical investment costs”) while holding nevertheless that the Fair Market Value was the proper compensation standard in international arbitration. Some members of the arbitration community have criticised reliance upon Fair Market Value. Some arbitrators assert that Fair Market Value is not the proper measure in some particular circumstances, see Kantor (n. 42), 50 *et seq.*

⁵¹ Kantor (n. 42), 8; Joseph Merhai, *Le processus d’évaluation en droit commercial et en droit fiscal – de la diversité vers la cohérence*, GesKR 3/2010, 331; Peter (n. 45), 56.

⁵² Seyed Khalil Khalilian, *The Place of Discounted Cash Flow in International Commercial Arbitrations: Awards by Iran-United States Claims Tribunal*, *Journal of International Arbitration* (Vol. 8 Issue 1), 1991, 37.

⁵³ Market-based approach should not be confused with Market Value or Fair Market Value. Market-based approach is just one of the means to determine the (Fair) Market Value of a business.

ods which add together the values of individual assets that constitute the business. This approach is based on the assumption that an asset is not worth more than it would cost to replace all of its constituent parts.

Income-based and Market-based approaches are the most commonly used methods in business practice. The Income-based approach, with its direct focus on future earnings, is considered to be a strong method, while the Market-based approach is the easiest to apply when similar assets are sold on the open market.⁵⁴

The DCF method, *i.e.* the Income-based approach, is a widely used valuation method for the following reasons:

- As regards the Asset-based approach, there is a general consensus that for M&A transactions the mere book value of a target company is usually not appropriate.⁵⁵ The net asset value is in practice the most frequently used Asset-based valuation method but the DCF method is seen as a more adequate valuation method because it provides information about future earnings. In this respect, it should be noted that in principle an acquisition is not made on the basis of the net asset value of a company but rather on its capacity to generate future earnings.⁵⁶
- While the results obtained by the application of the DCF method may be corroborated by other indicators, such as comparable sales (Market-based approach), it remains one of the most reliable means to establish the value of an asset in situations where it may be difficult or impossible to find sales of comparable properties (as in oil and gas properties),⁵⁷ or where there is a limited number of transactions on the market, or where there is no market as such (for example in monopoly situations or in “closely held companies” when small groups of shareholders control the majority of shares).⁵⁸

- Valuation methods that apply an Income-based approach expressly take into account future profit capacities by seeking to forecast future income.⁵⁹
- An Income-based approach may be warranted when no actual market exists or when no realistic comparable sales or substitute (Market-based valuation method) is available.⁶⁰ In the absence of a market which would allow the fixing of an objective value, there is a need to resort to methods of valuation such as an Asset-based approach (replacement value, book value or liquidation value), Income-based approach (DCF calculation) and, to a lesser extent, a Market-based approach.⁶¹
- The Asset-based approach may be used only in certain limited situations. The general drawback of the Asset-based approach in business valuation is that it does not take into account the value of a business that exceeds the value of its individual assets, *i.e.* it does not incorporate the business’s goodwill. Furthermore, Asset-based valuation methods do not reflect the future profitability of an investment. Asset-based methods are therefore used when compensation is sought for the loss of individual assets (such as equipment, buildings, etc.).⁶²

As an aside, one may note that when it comes to transactions between related parties involving a Swiss purchaser or seller, the Swiss tax authorities (*i.e.* the Swiss Federal Tax Administration) verify that the price corresponds to arm’s length terms (in particular for Swiss withholding tax purposes). To this effect, Swiss tax authorities, as a rule, apply the so-called “practitioners’ method”, pursuant to which the market value will correspond to the average between

⁵⁴ *Ripinsky/Williams* (n. 44), 193.

⁵⁵ *Peter* (n. 45), 56.

⁵⁶ *Peter* (n. 45), 59.

⁵⁷ *Knull/Jones/Tyler/Deutsch* (n. 3), 275.

⁵⁸ *Kantor* (n. 42), 48 *et seq.*

⁵⁹ In the *Aminoil v. Kuwait* case (*see American Independent Oil Company v. Government of Kuwait*, Award of 24 March 1982, 66 I.L.R. 518 1984), the arbitral panel nevertheless rejected the Income-based method put forward by the Claimant in favour of an Asset-based method to determine forward-looking damages.

⁶⁰ *Kantor* (n. 42), 60.

⁶¹ When no market for the company at issue exists, it will be difficult, depending on the activities of the company, to find sales of more or less comparable properties, thus precluding the application of the Market-based approach. See *Amoco International Finance Corp. v. Iran*, Award of 14 July 1987, 15 Iran-US CTR 189, 220: “The truth is that the absence of a market giving rise to the fixing of an objective market value compels recourse to alternative methods of valuation.”

⁶² *Ripinsky/Williams* (n. 44), 219.

the net asset value of the company and its return value. As per standard practice, the net asset value of the company is determined based on its net book value (increased by any amount of unrealized gains, if any). The return value generally corresponds to the weighted average of the net profits of the three previous commercial years, while taking into account a capitalization rate which may vary depending on the particular circumstances of the case (risk free rate, volatility, etc.).

This method may be summarised as follows:

$$V = \frac{V_i + V_r}{2}$$

whereby

- ‘Vi’ corresponds to the net asset value of the business, and
- ‘Vr’ corresponds to the return value of the business, determined as follows:

$$V_r = \frac{(V_r^{n-3} + V_r^{n-2} + V_r^{n-1}) \times k}{3}$$

whereby

- ‘k’ corresponds to a percentage that varies depending on the risk free rate and on the currency used by the company.

1.3 The approach of the Swiss Federal Supreme Court when valuing companies

Legal scholars in Switzerland are of the opinion that no method can in itself define the value of a business company, but only approximate it.⁶³ The legal concept of fair value (“valeur vraie”) and real value (“valeur réelle”) in the sense of an *objectively* accurate value are widespread in case law and legal doctrine.⁶⁴

As a matter of law, the Federal Supreme Court will usually verify whether lower courts have misconstrued the concept of real value (*Verkehrswert* = *valeur de marché*) or used a proper method of assessment.⁶⁵ According to the Federal Supreme Court, a valuation method may be appropriate only if it is consistent with the principles established by the business

community in the field concerned.⁶⁶ A method for assessing the value of a company will satisfy the conditions set forth by Federal law only if it appears to be understandable, leads to plausible results, enjoys recognition in practice, commonly applies in similar situations and takes into account the specificities of the case.⁶⁷

In practice, the Federal Supreme Court has used various valuation methods. When dealing with publicly traded companies, the Federal Supreme Court considers that their real value is their market price. In doing so, the Federal Supreme Court seems to consider that the valuation of this type of company may not be necessary, since its value is largely determined by the market itself.⁶⁸ When it comes to assessing the value of unlisted companies, it is the ongoing value that is assessed. To do this, resort is generally had to the net asset value (“Substanzwert”) or income value (“Ertragswert”) of the business company.⁶⁹

While the *Substanzwert* approach relies on Asset-based methods, the *Ertragswert* approach tends to the value of future profits which can be obtained by applying a discount rate.⁷⁰ According to some scholars, the Federal Supreme Court generally gives too much weight to the *Substanzwert* when assessing the real value of a company,⁷¹ thereby disregarding the fact that this value is no longer considered in micro-economics as the benchmark for assessing the “real” value of a company. Instead of being Asset-based oriented, valuation methods of business companies should therefore be, according to these legal scholars, more Income-based oriented.⁷²

⁶⁶ TF 4C.363/2000, c. 3b.

⁶⁷ TF 4C.363/2000, c. 3b.

⁶⁸ Roger Groner, Barabfindungsfusion (Cash Out-Merger), SJZ 99 (2003) 395.

⁶⁹ TF 4C.363/2000, c. 3b. It should be pointed out that when the company being valued is not profitable or is close to liquidation, the value of the company should only be based on the *Substanzwert* of the company.

⁷⁰ Groner (n. 68), 395.

⁷¹ Markus Vischer, Schaden und Minderwert im Gewährleistungsrecht beim Unternehmenskauf, SJZ 106 (2010) 133; Groner (n. 68), 396.

⁷² Peter Böckli, on the other hand, is of the opinion that relying on the forecast of future profits would not be adequate, since it is too speculative. While it is true that one cannot say with absolute certainty what the future profits of a company will be, the assumption that the company will not make more profits than in the past is just as uncertain. See in this regard, Groner (n. 68), 397.

⁶³ Merhai (n. 51), 330.

⁶⁴ See *inter alia* Articles 685b al. 1, 4 and 5 CO, 825 CO, 786 al. 2 ch. 3 CO, 789 CO and 23 al. 2 lit. a LFus.

⁶⁵ TF 5A_557/2008, c. 3.2.2; ATF 132 III 489, 491, c. 2.3.

In sum, although the Federal Supreme Court generally upholds the applicability of various valuation methods (“Methodenpluralismus”),⁷³ it does show sometimes reluctance to adopt Income-based approaches (such as the DCF method) when valuing business companies.⁷⁴

2. The DCF in brief

The process of calculating a claim brought under the DCF method is quite similar to the DCF process in industry valuations. The DCF method values an income-producing asset by estimating the cash flow which the asset would be expected to generate over the course of its life, and then discounting that cash flow⁷⁵ by a factor which reflects the time value of money and the risk associated with it.⁷⁶ Because cash to be received in the future is worth less than the same amount of cash received today, the net cash flow for each future year is discounted to determine its value on the valuation date.⁷⁷ The DCF is calculated as:

$$\text{DCF} = \frac{\text{CF}_1}{(1+r)^1} + \frac{\text{CF}_2}{(1+r)^2} + \dots + \frac{\text{CF}_n}{(1+r)^n}$$

where n = life of asset (or the period in which the projection is made)

CF = cash flow

r = discount rate (WACC).⁷⁸

This purely forward-looking method recognises that the economic value of an ongoing concern is the income flows that it can generate throughout its existence. In other words, the value of a business consists in the profits that it can generate. It does not take into account its liquidation value since it starts from the assumption that the activity of the company will not stop. Accordingly, the applied discount rate should reflect all the risks associated with the company in question, such as business risk, market risk, financial risk, liquidity risk, currency risk and political risk.⁷⁹

For businesses, which may potentially exist indefinitely, cash flows are estimated for two periods of time. First, a defined specific forecast period lasting until the cash flows are at a steady level (three to five years) and an implicit period that represents the remainder of the investment’s productive life (the “terminal value”).⁸⁰ This terminal value allows for the limitation of cash flow projections to a several-year period.

The DCF method does not calculate future damage in itself because it determines only the current value of the company. However, the current value is based on the company’s future revenues. The final decision regarding the amount of damages obtained by this tool will therefore very much depend on the various factors which are used in the DCF calculation.⁸¹ To this extent, DCF computations can vary widely, depending on different assumptions employed in forecasts about future revenues and expenses, interest and inflation rates currency fluctuation or the starting and ending of the DCF forecast period.

⁷³ TF 4C.363/2000, c. 2c: “Daraus ergibt sich dass der Verkehrswert [einer Aktie] je nach dem Vermögensgegenstand und den Verhältnissen im Einzelfall nach verschiedenen Methoden ermittelt werden muss.”

⁷⁴ Without expressly referring to it, the Federal Supreme Court indicated that situations might exist that would justify considering only future profits when determining the *Ertragswert* of a business, see TF 4C.363/2000, c. 3b.

⁷⁵ *Khalilian* (n. 52), 32.

⁷⁶ *Raymond Bishop/James Crawford/W. Michael Reisman*, *Foreign Investment Disputes: Cases, Materials and Commentary*, The Hague 2005, 1344.

⁷⁷ In *Amoco International Finance Corp. v. Iran* (n. 61), 213 the arbitral panel gave the following explanation of the DCF method: “The first step in valuing an asset pursuant to the DCF method must be to project from the valuation date onward the most likely revenues and expenses of the ongoing concern, year by year. The revenues less the expenses will give the future cash flow. The second step will be to discount the projected net cash flow to its ‘present value’ as of the valuation date by applying a discount rate.”

⁷⁸ In order to compute an appropriate discount rate, experts usually resort to the Weighted Average Cost of Capital

(WACC) method, which consists in considering that the proper discount rate should approximate the balance between risks and benefits.

⁷⁹ *Vidya Rajarao*, *Determining Damages in Cross-Border Disputes*, *Transnational Dispute Management TDM* 6 (2007); *Frank K. Reilly/Keith C. Brown*, *Investment Analysis and Portfolio Management*, Orlando 1997; *Rapport du Conseil fédéral, Valeur des entreprises en droit successoral*, 1^{er} avril 2009, 9 *et seq.*; *Gantenbein/Gehrig* (n. 1), 606 *et seq.*; *Paul D. Friedland/Eleanor Wong*, *Measuring Damages for the Deprivation of Income-Producing Assets: ICSID Case studies*, 6 *ICSID Review – Foreign Investment Law Journal*, 406–407.

⁸⁰ *Ripinsky/Williams* (n. 44), 196. See also *Oliver Ambs/Jean-Jacques Wymann*, *L’évaluation des petites et moyennes entreprises*, *TREX* 2011, 146, 147.

⁸¹ *Bishop/Crawford/Reisman* (n. 76), 1345.

3. The traditional use of the DCF method and its limits

3.1 The main fields of use

The DCF method is generally used outside the quantification of damage. The main fields of use are those of mergers, acquisitions and inheritance of businesses. In the context of M&A transactions, the DCF method helps the seller of a target company set to a certain price in a justifiable manner.⁸² For its part, the buyer may examine the plausibility of the requested price by using the valuation methods it deems appropriate.

The DCF method is also frequently used when valuing real estate, since both Swiss and international accounting rules require a periodic valuation at the market price. Many commercial property market brokers, lenders and owners use real estate appraisals based on an income approach to value property using either direct capitalization or DCF methods. In real estate matters, the DCF method is regarded as particularly appropriate because many calculation parameters are known and relatively predictable – such as rent and operation expenses – and secondly, because the estimated cash flow is a necessity in the context of real estate management.⁸³ The advantage of the DCF method in valuing real estate is that it makes the valuation more transparent. It clearly identifies assumptions (market expectations) relating to future rental growth, holding period, depreciation, refurbishment, taxation or costs of management and transfer.⁸⁴

Finally, in the context of damage calculation, the DCF method is a tool to measure the value of a company by forecasting net cash flows over a period of

time, reducing it by a discount rate to the date when the damage occurred.⁸⁵

However, a number of risks associated with the use of this method have been identified and have limited the circumstances in which it is used.

3.2 The risks associated with the use of the DCF method

3.2.1 Lack of certainty

Valuation “is, in essence, a prophecy as to the future”.⁸⁶ To assess damage suffered by a company or to value a business, a court, an arbitrator or an expert must answer questions about that future. Looking into the future implies that one makes assumptions and subjective choices regarding different elements such as market conditions, expected sales, costs, need for additional capital, fluctuations in the inflation rate, levels of risk etc. The end-result is somewhat speculative.

Under these circumstances, one can legitimately wonder whether the DCF method should even be used at all for the valuation of compensation.⁸⁷ Due to its inherently speculative nature, the DCF has been applied in some international arbitration cases (with the introduction of some legal safeguards)⁸⁸ while rejected in others.⁸⁹

⁸² *Peter* (n. 45), 56.

⁸³ *André Bender/Martin Hoesli/Elion Jani*, L'évaluation immobilière – Apport des simulations Monte Carlo, ECS 2006, 564–565; *Nabil Aziz/André Bender/Martin Hoesli*, Evaluation immobilière par les DCF, L'expert-comptable suisse 2005/1, 344–345; *Jean-Yves Rebord*, La réglementation des placements collectifs immobiliers: analyse systématique des différents organismes et appréciation critique du régime instauré par la Loi fédérale sur les placements collectifs de capitaux, Genève 2009.

⁸⁴ *Nick French/Laura Gabrielli*, Discounted Cash Flow: Accounting for Uncertainty, *Journal of Property Investment & Finance*, 23 (1), 2005, 76–89.

⁸⁵ *Ripinsky/Williams* (n. 44), 195; *Henry Weisburg/Christopher Ryan*, Means to be Made Whole, in Evaluation of damages in international arbitration, *Dossiers ICC Institute of World Business Law*, 2006, 173; *Florence Guillaume*, Aspects successoraux de la transmission d'une entreprise à un descendant, *SJ* 2009 II 33, n. 25; *Gantenbein/Gehrig* (n. 1), 602.

⁸⁶ *Kantor* (n. 42), 7.

⁸⁷ *Levitt v. Iran*, 14 Iran-US CTR (1987), which involved the business of selling housing units in Iran and where the arbitral tribunal denied a claim for lost-profits as too speculative, since the Claimant did not have any commitments from the Iranian government or prospective purchasers for the housing units.

⁸⁸ See, *inter alia*, *Phillips Petroleum v. Iran*, Award of 29 June 1989, 21 Iran-US CTR 79; *Enron v. Argentina*, Award of 22 May 2007, ICSID Case No. ARB/01/3; *ADC v. Hungary*, Award of 2 October 2006, ICSID Case No. ARB/03/16.

⁸⁹ See, *inter alia*, *Tecmed v. Mexico*, Award of 29 May 2003, ICSID Case No. ARB/00/2; *Metalclad v. Mexico*, Award of 30 August 2000, ICSID Case No. ARB/97/1; *Southern Pacific Properties (Middle East) Ltd v. Egypt*, Award of 20 May 1992, ICSID Case No. ARB/84/3; *Compania de Aguas del Aconquija S.A. and Vivendi Universal S.A. v.*

The somehow speculative character of the DCF method was strongly criticised by the arbitral panel in the case *Amoco International Finance Corp. v. Iran*. In its reasoning the panel displayed a very sceptical approach regarding the use of the DCF method, observing that the calculation of revenues expected to accrue over a long period of time in the future opens a large field of speculation and would yield higher results than any other methods.⁹⁰ As pointed out by the panel, any cash flow projection would have an element of speculation. This speculative element would rapidly increase over the number of years to which a projection relates.⁹¹ As for the discount rate to be used in the second stage of the DCF calculation, it would be in some cases completely artificial and lead to even more speculation.⁹²

Some legal scholars have taken or are moving toward this position by considering that although future projections are useful for the purpose of mergers, acquisitions and the like, such future projections are not compatible with the aim of awarding claims in a legal dispute, a process which requires the greatest degree of certainty possible.⁹³ The underlying rationale behind this position is that while investors can accommodate uncertainties and risks, judicial institutions should strive to avoid any uncertainty when awarding damages.

Some M&A practitioner have also pointed out that earnings-based valuations (such as the DCF method) create more uncertainty when the contractual reference period is long and are thus more vulnerable to attempts to manipulate the results in mergers and acquisitions.⁹⁴

Argentine Republic, Award of 20 August 2007, ICSID Case No. ARB/97/3; *Wena Hotels, Ltd. v. Egypt*, Award of 8 December 2000, ICSID Case No. ARB/98/4; *Autopista v. Venezuela*, Award of 23 September 2003, ICSID Case No. ARB/00/5 and *Amoco International Finance Corp. v. Iran* (n. 61).

⁹⁰ *Amoco International Finance Corp. v. Iran* (n. 61), 223.

⁹¹ *Amoco International Finance Corp. v. Iran* (n. 61), 262.

⁹² *Amoco International Finance Corp. v. Iran* (n. 61), 256.

⁹³ *Khalilian* (n. 52), 46.

⁹⁴ *Peter* (n. 45), 59. As regards the debates surrounding the alleged speculative nature of the terminal value computations, see *Matrix Group Ltd. v. Rawlings Sporting Goods Company, Inc.*, 47 F.3d 583, 594 (8th Cir. 2007). See also *Kantor* (n. 42), 180 and *Daniel Knüsel*, Die Anwendung der Discounted-Cash-Flow-Methode zur Unternehmensbewertung, Der Schweizer Treuhänder, 1995/7–8, 621.

3.2.2 Going concern/Track record

The economic value of a company depends on its ability to show profitability in the future. Only projects capable of generating future revenue streams represent what is called a going concern, and this is the only kind of company whose valuation may be carried out by running the DCF valuation method.⁹⁵ If the company being valued is not a going concern, it will be very difficult to project estimated revenues.⁹⁶ In sum, the DCF method should not be applicable where a company or an investment appears to have no future. In this case, the liquidation value of the company is to be calculated.

The calculation of lost future earnings may be difficult for business companies that have not yet begun production (no track record), for business companies that sell their products on an uncertain or illiquid market or for start-up companies (very limited track record).⁹⁷ Despite having evidence of a track record, some arbitral tribunals have at times refused to compensate investors for lost profits claiming that “future loss to the Claimants is uncertain and any attempt to calculate it is speculative”⁹⁸.

The Swiss Federal Council, in its report “on the value of companies in inheritance law” has identified the problem as follows: “issuing a forecast for future performance (using the DCF method) is the most difficult and uncertain element of the calculation of a company’s value due to the pitfalls of speculative and idealistic representations. A forecast may fall into the categories of [...] probable or improbable, possible and plausible”⁹⁹.

Many scholars adhere to this opinion, which we embody in the following quotation: “There is no single means by which to determine the future cash flow and profits of a going concern.”¹⁰⁰ Rather, parties and

⁹⁵ *Khalilian* (n. 52), 33.

⁹⁶ *Phelps Dodge v. Iran*, 10 Iran-US CTR 121, 1986, 30. See also *Lane v. Cancer Treatment Centers of America, Inc.*, 2004 Del. Ch. LEXIS 108, *93 where the Court held that “one can reasonably have doubts about the ability of a DCF analysis to capture accurately the fair value of an emerging company with an earnings history of less than two years”.

⁹⁷ *Kantor* (n. 42), 76.

⁹⁸ *LG&E v. Argentina*, Final Award of 25 July 2007, ICSID Case No. ARB/02/01, § 90.

⁹⁹ Rapport du Conseil fédéral (n. 79), 9 *et seq.*

¹⁰⁰ For a discussion of case law and legal opinions on what constitutes a going concern and the manner in which that

courts or arbitral tribunals must extrapolate future performance from an enterprise's current financial position, past profitability, market trends and industry analysis. Likewise, it is often extremely difficult to calculate an appropriate discount rate [...]. Finally, it is often difficult to obtain the objective data necessary to allow a court or arbitral tribunal to calculate an enterprise's future revenue stream".¹⁰¹

3.2.3 Discount rate

The final DCF amount can be very sensitive to differences in discount rates. The size of the discount rate is inversely related to the size of the award: the higher the risk, the higher the discount rate necessary and the lower the present value of the projected stream; the lower the risk, the lower the discount rate, and the higher the present value.¹⁰²

It should be kept in mind that even a minor change in the cash flows or discount rate can lead to substantial differences in results,¹⁰³ including the overvaluation of the plaintiff's claim. In large investment disputes, a difference of a few percentage points between discount rates can significantly affect the final compensation.¹⁰⁴ In the case, *Robert Michael Lane v. Cancer Treatment Centers, Inc.*, concerning a Delaware shareholder appraisal, the difference between the discount rate proposed by the petitioner (27,43%) and that of the respondent (27,9%), *i.e.* a difference of 0,47%, resulted in a 7% difference between the two competing valuations.¹⁰⁵ It is hardly surprising to observe under these circumstances that claimants tend to advance a low discount rate while respondents propose high discount rates.¹⁰⁶ Very small changes in

the cash flow projections or in the discount rate can considerably change the valuation's results.¹⁰⁷

The discount rate aims, *inter alia*, at accommodating the uncertainties discussed above (such as a limited or no track record, as well as an uncertain or illiquid market). However, when the adjustment of a discount rate creates too much uncertainty, some courts or arbitral tribunals may decide to reject any claim for compensation and refuse to apply the DCF approach.¹⁰⁸

3.2.4 Conclusion

Due to the risks associated with the use of the DCF method, certain legal scholars consider that the DCF method cannot determine the Market value, *i.e.* the amount a sensible buyer would pay.¹⁰⁹ These are also the conclusions which arbitral tribunals often reach.¹¹⁰ Due to the speculative elements of the method, arbitral tribunals are very cautious in its application.¹¹¹

As formulated by *Khalilian*, a former arbitrator for the Iran-US Claims Tribunal, "there is a big difference between an investment decision in the market and a judicial decision in a court [...] a businessman can and should accept calculated risks [...] based on forecasts of an uncertain future. The judicial organs, however, have a mandate to reduce as much as possible the element of uncertainty or risk when called upon to decide on a legal issue".¹¹²

In view of this tension, it may be tempting simply to dismiss the use of the DCF method when assessing damage. But speculation and uncertainty can

determination affects the choice of valuation methodology, see the authors and case law cited in *Knull/Jones/Tyler/Deutsch* (n. 3), 274 footnote 13.

¹⁰¹ *Weisburg/Ryan* (n. 85), 174.

¹⁰² *Knull/Jones/Tyler/Deutsch* (n. 3), 276. As explained by *Bishop/Crawford/Reisman* (n. 76), 260, "in cases where lost profits have been awarded, it has been where an anticipated income stream has attained sufficient attributes to be considered a legally protected interest or sufficient certainty to be compensable. This has been achieved by virtue of contractual arrangements or, in some cases, a well-established history of dealings".

¹⁰³ *Rapport du Conseil fédéral* (n. 79), 11.

¹⁰⁴ *Kantor* (n. 42), 140.

¹⁰⁵ *Lane v. Cancer Treatment Centers of America, Inc.* (n. 96).

¹⁰⁶ *Thomas Stauffer* speaks of the "Cinderella effect", that is the systematic overstatement of value (see *Thomas*

Stauffer; Political Risk and Overseas Oil Investment, Symposium on Energy, Finance, and Taxation Policies, 19–20 September 1988, Washington, D.C.).

¹⁰⁷ *Amoco International Finance Corp. v. Iran* (n. 61).

¹⁰⁸ *PSEG v. Turkey, PSEG Global, Inc. and Kenya Ilgin Elektrik Uretim ve Ticaret Limited Sirketi v. Republic of Turkey*, Award of 19 January 2007, ICSID Case No. ARB/02/5.

¹⁰⁹ *Khalilian* (n. 52), 40–41 according to whom the DCF valuation method would yield a much higher figure than the amount a sensible businessman would be willing to pay in the market.

¹¹⁰ *Autopista v. Venezuela* (n. 89), § 353–355.

¹¹¹ *Thomas Stauffer*, Valuation of Assets in International Takings, 1996, 17 *Energy Law Journal*, 480 *et seq.*; *Carl Helbling*, Grundsätze für die Unternehmensbewertung, *Der Schweizer Treuhänder* 2002/9, 736; ILC Articles on State Responsibility, commentaire de l'article 36, § 36; *Ripinsky/Williams* (n. 44), 201.

¹¹² *Khalilian* (n. 52), 46–47.

nevertheless be mitigated by taking a conservative approach in order to circumscribe the risks inherent in the DCF method.

3.3 *Circumscribing the risks inherent to the DCF method*

We are not of the opinion that the DCF method should be disregarded *per se* when valuing damage and the subsequent compensation to be awarded to a successful claimant. It must be recalled that the use of the DCF method is favoured, if not recommended, in real estate valuation,¹¹³ M&A transactions,¹¹⁴ inheritance of a business¹¹⁵ and even in international commercial and investment arbitration when determining appropriate compensation.¹¹⁶ However, the risks which have been briefly outlined above require the development of a number of safeguards in order to avoid compensating for speculative losses. Recoverable damage must indeed be shown with reasonable certainty. In order to meet the standard of reasonable certainty:

- First, there must be sufficient evidence regarding the past performance of a company (track record). Where a company has not operated for a sufficiently long time to establish a performance record or where a company has failed to make a profit, future profits cannot be used to determine going concern or Market value.¹¹⁷ The Swiss Federal Council, while stressing that future results are crucial, has stated that a company's results of the preceding three years are needed to establish a forecast.¹¹⁸ Similarly, scholars consider that while the DCF method can be appropriate to assess damage incurred in relation to the acquisi-

tion of a company – the price of which has been overvalued at the conclusion of the contract – this method should not be used unless a company's results over the last three to five years are available.¹¹⁹

- Second, only reasonable projections into the future should be made. In the field of real estate, the Federal Supreme Court considers that the period to take into account should not exceed five to ten years when it comes to establishing market development projections.¹²⁰ This follows the opinions expressed by experts in the real estate market who consider that a ten-year period is a maximum, beyond which even a small change in income or estimated growth rate can significantly alter the projected results, thus making the DCF method arbitrary and random. It is also the view expressed in literature on companies' valuation: a period of ten year is the maximum, beyond which the application of the DCF method would be but "a theoretical extrapolation with no interest".¹²¹ Some authors consider that forecasting cash flows beyond an initial period of five to seven years may be impractical given the great uncertainty involved in predicting industry and macroeconomic conditions beyond merely a few years.¹²²
- Third, past results of an enterprise should not be transposed alone, without further analysis, into the future.¹²³
- Fourth, there should not be a large disparity in the amount actually invested and the Market value claimed.¹²⁴
- Fifth, in determining the value using discounted cash flow, courts or arbitral tribunals should be willing to adjust cash flows in order to reflect potential uncertainties. While they may defer to an expert's calculations with respect to the selection of the discount rate, they should also depart from the expert's recommendations and evaluate the components of cash flow just as a hypothetical businessman contemplating a purchase

¹¹³ *Aziz/Bender/Hoesli* (n. 83), 345–346.

¹¹⁴ *Peter* (n. 45), 55 *et seq.*

¹¹⁵ *Guillaume* (n. 85), 46.

¹¹⁶ *Phillips Petroleum v. Iran* (n. 88); *Enron v. Argentina* (n. 88); *ADC v. Hungary* (n. 88).

¹¹⁷ *Metalclad v. Mexico* (n. 89), 121. One problem in performing a discounted cash flow analysis is indeed one of sufficient evidence as to net cash flows. In this respect, the World Bank Guidelines require that an asset be a going concern with a proven record of profitability in order to perform a discounted cash flow analysis. See *Markham Ball*, *Assessing Damages in Claims by Investors Against States*, 16 ICSID Rev. – FILJ 408, 422–423 (2001).

¹¹⁸ Rapport du Conseil fédéral (n. 79), 10–11; see also *Gantenbein/Gehrig* (n. 1), 602; *Bender/Hoesli/Jani* (n. 83), 564 *in fine*; *Guillaume* (n. 85), n. 25.

¹¹⁹ *Vischer* (n. 71), 132.

¹²⁰ ATF 134 II 160, c. 13.

¹²¹ *Vernimmen/Quiry/Le Fur* (n. 1), chapter 37, 744.

¹²² *Ripinsky/Williams* (n. 44), 196.

¹²³ Rapport du Conseil fédéral (n. 79), 10.

¹²⁴ *Wena Hotels v. Egypt* (n. 89).

would do.¹²⁵ In particular, they must freely call into question the figures used by the experts, especially when it comes to the assessment of the risks to take into account when determining the discount rate.

- Sixth, in breach of contract cases, courts or arbitral tribunals must strive to avoid any risk of double-counting. Dividing a compensation analysis into a reliance interest (*damnum emergens*) and an expectancy interest (*lucrum cessans*), but using a single DCF forecast, may result in double-counting.¹²⁶ Since the cash flows that constitute a recovery by the investor of invested capital as well as the component that constitutes a return on that capital equity are included in the DCF calculation, the investor's recovery will double count the invested capital if a successful claimant is awarded recovery of invested equity and separately the full present value of the discounted net cash flow of the company. In order to avoid such double-counting it is essential to make sure that the deciding authority provides for the DCF method alone or provides for recovery of invested capital and DCF net future earnings, with a rather complicated adjustment, to remove the recovered capital from the earnings computation.¹²⁷

This is why the risk assessment incorporated in the discount rate has been often criticized in the sense that if the risk is under- or overestimated, the calculations are considerably altered.

4. The use of the DCF method in damage calculation

4.1 The DCF method in international arbitration practice

In the era of growing cross-border economic activities, the number of disputes concerning foreign investments has grown substantially. The question of applying the DCF method is regularly discussed in arbitration¹²⁸ as a tool for determining the value of a company in the context of legal proceedings,¹²⁹ especially when compensation for the *damnum emergens* is sought by an aggrieved party.¹³⁰

Commentators have noted that some arbitral panels have been reluctant to rely on DCF projections for lost earnings (*lucrum cessans*) determinations: "In rejecting the DCF method for estimating investment value, the *Tecmed* panel relied on a number of prominent arbitration awards adopting the same approach. Indeed, it is one of the puzzling aspects of contemporary investment treaty arbitration practice that tribunals have repeatedly resisted a method nearly universally recognised in the economics community as the most reliable way to estimate the Market value of ongoing concerns".¹³¹

In reading these awards, we are struck by the fact that a significant number of arbitral tribunals have held that the method was inappropriate given the facts of the case and the risk of speculation that it involved. For example, one arbitral tribunal held that "the DCF method is probably extremely helpful when an investor has to decide to make large investment. [...] The Tribunal can also perceive the advantage of such a method for a plaintiff seeking substan-

¹²⁵ *Knoll/Scott/Tyler/Deutsch* (n. 3), 290, discussing the award rendered in *Starrett Housing Corp. et al v. Iran*, Award of 14 August 1987, reprinted in 16 Iran-US CTR 112 (1988). In this award, the arbitral panel reduced its own expert's calculation of the net revenue of the project company at issue by some 90% (reducing revenues net of costs from 377 million Rials by 350 million Rials, to 27 million).

¹²⁶ *Himpurna v. PLN*, Award of 4 May 1999, XXV Yearbook of Commercial Arbitration 13, 242: "To ask for the full amount of the future revenue stream when also claiming recoupment of all investments is wanting to have your cake and eat it too [...]"

¹²⁷ *Patuha Power Ltd. (Bermuda) v. PT. (Persero) Perusahaan Listrik Negara (Indonesia)*, Award of 4 May 1999, in: Mealey Publications, Inc., King of Prussia, PA, vol. 14, #12, 12/99, B-1 to B-49.

¹²⁸ *Richard Hamilton Kreindler*, Introduction, in: Evaluation of damages in international arbitration, Dossiers ICC, Institute of World Business Law, 2006, 8; *Paul-A. Gelinas*, General characteristics of recoverable damages in international arbitration, in: Evaluation of damages in international arbitration, Dossiers ICC, Institute of World Business Law, 2006, 12; IVSC International valuation standards, General valuation concepts and principles, § 9.2; see also *Gantenbein/Gehrig* (n. 1), 602.

¹²⁹ *Amco Asia Corporation v. Republic of Indonesia*, ICSID Case No. ARB/81/1; see also *Thomas Wälde/Borzou Sabahi*, Compensation, Damages and Valuation in International Investment Law, Transnational Dispute Management – Vol. 4, Issue 6, 2007.

¹³⁰ *Amoco International Finance Corp. v. Iran* (n. 61).

¹³¹ *Kantor* (n. 42), 40 citing *Coe & Rubins*.

tial compensation. The calculation of the revenues expected to accrue over a long period of time in the future, which opens a large field of speculation due to the uncertainty inherent in any such projection, will probably yield higher results than any other method. For this reason, however, such a method cannot easily be accepted by a tribunal, and the reluctance of all tribunals and claims commissions, including domestic fora, even in the United States, to make use of it is easy to understand¹³².

Recalling that damage must be established with some degree of certainty, some arbitral tribunals have rejected the DCF method invoked by plaintiffs for various reasons, among which include:

- The absence of a going concern. In *Metalclad Corp. v. The United Mexican States*, the arbitral panel held that a period of two or three years was required before the company could be considered as a going concern.¹³³
- The lack of data on the company's past performance. In *AIG v. Iran*, the arbitral panel noted that the “company had been conducting its business only for little more than four and a half years, and such a short period must be deemed to provide an insufficient basis for projecting future profits”, despite the arbitral tribunal's findings that the company was a going concern.¹³⁴
- The inability to establish with a sufficient degree of certainty the future profitability of the investment;¹³⁵
- The plaintiff's lack of sufficient financial resources allowing him to effectively complete or exploit its investment;¹³⁶
- The significant disparity between the amount actually invested and the value claimed.¹³⁷

¹³² *Amoco International Finance Corp. v. Iran* (n. 61).

¹³³ *Metalclad v. Mexico* (n. 89); *Southern Pacific Properties (Middle East) Ltd v. Egypt* (n. 89); *Noble Ventures v. Romania*, ICSID Case No. ARB/01/11, Award of 5 October 2005. *Weisburg/Ryan* (n. 85), 174, 175.

¹³⁴ *Tecmed v. Mexico* (n. 89); *Metalclad v. Mexico* (n. 89); *Southern Pacific Properties (Middle East) Ltd v. Egypt* (n. 89); Rapport du Conseil fédéral (n. 79), 10; *Helbling* (n. 111), 736.

¹³⁵ *Vivendi v. Argentina* (n. 89).

¹³⁶ *Wena Hotels v. Egypt* (n. 89).

¹³⁷ *Wena Hotels v. Egypt* (n. 89); *Tecmed v. Mexico* (n. 89).

4.2 The DCF method in Swiss case law

To date, the DCF method has never been used by the Federal Supreme Court to calculate compensation for damage. However, the Federal Supreme Court was given the opportunity to mention it as part of indemnity proceedings brought by local residents near the Zurich airport, who complained about the impact of aircraft noise on property values. The plaintiffs argued that the value of their property – leasing property – should be determined by their yield value and not by their market value. The Federal Supreme Court nevertheless preferred to apply the *Minderwert Fluglärm (MIFLU)* method for the claim,¹³⁸ which was better suited for the case at hand. This method is based on the analysis of prices in real estate transactions. By using a so-called multiple regression model, the MIFLU method seeks to determine the value of each feature of the property evaluated, such as age, area, construction and maintenance quality, neighbourhood, etc. In this way, it is possible to evaluate a property using hard data and avoid having to apply unclear discounting rates.¹³⁹

4.3 Lessons from the Swiss Federal Supreme Court judgement ATF 134 II 160

We can draw three lessons from this decision:

- Although the Federal Supreme Court has adopted a method other than the DCF, it mentioned the DCF method as one possible method that can be applied and made clear that in principle there was no obstacle to its use.
- When there is a choice between different applicable methods, resort should be made to the method that appears to be the most appropriate considering the facts of the case.
- The Federal Supreme Court did not itself consider the position on the application of the DCF method since it was deemed necessary to take into account the specificities of the local market in order to apply the method. The Federal Supreme Court instead referred the case to the lower court so that it could appreciate local circumstances. In other words, whatever the selected method, a court or arbitral tribunal must ensure that it is not only

¹³⁸ ATF 134 II 160, c. 13.

¹³⁹ *Bender/Hoesli/Jani* (n. 83), 564–565.

appropriate but also that the concrete elements emerging from the case are correctly taken into account.

III. Lessons from tort law on the application of the DCF method

1. The current situation

Although, in practice, the DCF method is commonly used in Switzerland as a way to value a company, it has so far never been used, to our knowledge, by the Federal Supreme Court, as a means to calculate damage in tort law cases. This does not mean, however, that it is inapplicable in this field. Indeed, insofar as it is accepted in tort law that future damage should be compensated as long as it is sufficiently foreseeable, and that its calculation can be completed in certain instances by applying tables, statistics or other theoretical methods, the DCF method can be taken into account as one of the means available to courts or arbitral tribunals.

2. The application of the DCF method in view of the concrete calculation requirements

In applying the principles established by Swiss case law to calculate damage – especially future damage – as mentioned above, we reach the following result:

- The use of a method such as the DCF is admissible to calculate damage to the extent that damage cannot be established in a concrete manner (*supra* I.3). There is no obstacle in principle that opposes this method.
- The DCF method may only be applied subject to the requirement in Article 42 (2) CO. Accordingly, a plaintiff must make every effort to argue and establish the elements of his damage (*Substanzierungspflicht*, *supra* I.1.2), even if such demonstration is particularly difficult given the nature of the injuring conduct (*supra* I.1.3).¹⁴⁰ In the field of company valuation, the harmed party must provide the court or arbitral tribunal with all relevant elements relating to the company's per-

formance, the market in which it operates and its expected developments. If the business development of the company being valued – for example a joint venture in the course of creation – requires a plaintiff personally to invest financial resources, the plaintiff must prove that he would have had such resources and that the project would have effectively been possible (*supra* II.4.1 *in fine*).

- The court or arbitral tribunal must verify the appropriateness of the DCF method in relation to the specific case to be decided, as is the case for any contemplated method (*supra* II.4.2 and II.4.3).¹⁴¹ This implies in particular that the court or arbitral tribunal has a record of the company's performance during the last three to five years (at least), in order to enable it to assess the risks associated with managing the company under valuation (financial risk, liquidity risk, exchange rate risk, political risk, business activity risk, etc.), and thus to choose the appropriate discount rate. This requirement excludes in principle the use of the DCF method for a start-up at the beginning of its existence or a joint venture that has not yet operated. It is interesting to note that, even if U.S. courts are more likely to use DCF methods, they establish similar requirements: “Typically, Delaware courts tend to favor a DCF model over other available methodologies in an appraisal proceeding. However, that metric has much less utility in cases where the transaction giving rise to appraisal was an arm's-length merger, where the data inputs used in the model are not reliable, or where a DCF is not customarily used to value a company in a particular industry”.¹⁴²
- Even though the DCF method intends to set the current value of the company, its application is subjected to the rules governing compensation for future damage because it is the company's future income that is used to assess this value (*supra* II.1). This income must be determined with sufficient certainty. If these conditions are not met

¹⁴⁰ Handelsgericht des Kantons Zürich (6 November 1998), ZR 100 (2001) N 31, 97, in particular 106.

¹⁴¹ ATF 134 II 160, c. 13; 129 III 135, c. 4.2.2.1 = JdT 2003 I 511.

¹⁴² *Highfields Capital, Ltd, Highfields Capital I, L.P. et Highfields Capital II, L.P. v. AXA Financial, Inc.*, Court of Chancery of Delaware, New Castle County, C.A. N° 804-VCL, 17 August 2007, c. IV A.

damage turns hypothetical and is thus not compensable (*supra* I.2 *in fine*).¹⁴³

- The period over which the DCF method will be applied must be limited, typically up to ten years (*supra* II.3.3).¹⁴⁴ Beyond this period, a future damage becomes speculative and it would be difficult to accept that such damage is sufficiently foreseeable.
- The risk factor should be sufficiently predictable so that the discount rate can be determined with reference to the prevailing and foreseeable future conditions.
- In setting the discount rate, the court or arbitral tribunal should avoid taking into account the same risk twice (for example, the arrival of a competitor, market deregulation and legislative change which is likely to affect the activities of the evaluated company, etc.), once by the capitalization rate itself, and a second time by the specific assessment of the risk in question.¹⁴⁵

3. The court's/arbitrator's discretion vis-à-vis the expert

The quantification of damage by resorting to the DCF method can be a very complex exercise requiring special knowledge, especially where there is a need to value business interests, which makes the involvement of valuation experts almost inevitable.

Expert determination can be a very efficient way to solve a conflict about a factual issue, such as a valuation.¹⁴⁶ The expert's role will be to assist in ascertaining and assessing facts which involve technical matters that fall outside the general knowledge of courts, arbitral tribunals or lawyers.¹⁴⁷ In practice, the projection of the cash flow into the future and the determination of an appropriate discount rate will trigger sharp and highly technical disputes between experts.¹⁴⁸ These disputes will increase to a peak in both international commercial and investment arbitra-

tion since party-appointed experts will base their analyses on assumptions and factual data provided by the relevant party. When instructing their experts, parties may be tempted to provide data that will influence the outcome in their favour.

A court or arbitral tribunal shall in principle not be bound by the conclusions of an expert, even where it has appointed the expert. The expert should in no way become a *de facto* arbitrator or judge on valuation issues. This is all the more so in international arbitration, where parties retain their own experts to rebut the opposing party's estimate and often provide an alternative quantification. Under these circumstances, courts or tribunals should treat the opinions of party-appointed experts and court/tribunal-appointed expert merely as evidence and refrain from delegating the decision-making process to experts.

Courts or arbitral tribunals are free to decide how much weight to grant to an expert's opinion. But if they intend to deviate from these conclusions and decide to adjust or change the expert's conclusions, they must provide reasons to substitute the expert's opinion with their own on matters requiring special knowledge.¹⁴⁹

That being said, in the same way courts or arbitral tribunals may not depart from the expert's conclusions without reason, they must also apply those conclusions taking into account the particular aspects of the case (*supra* II.4.3). In any event, it is up to the court or arbitral tribunal, exercising its discretion to fix the amount of compensable damage. It is only the deciding authority which – if need be – will apply Article 42 (2) CO to calculate the damage, building on the expert's determination of the damage by means of the DCF method.

In light of the above, it is worth pointing out that a court or arbitral tribunal needs to be very diligent in order to grasp valuation issues if it wants to be able to rely on the conclusion of an expert while exercising its decision-making power. This point raises a delicate question, which is not addressed in the present article, but which might be worth discussing at greater length.

¹⁴³ TF 4C.114/2006, c. 5.1; ATF 129 III 18, c. 2.4; 82 II 401.

¹⁴⁴ ATF 134 II 160, c. 13; *Vernimmen/Quiry/Le Fur* (n. 1), chapter 37, 744;

¹⁴⁵ ATF 129 III 135, c. 4.2.2.3; 113 II 345, c. 2b; Rapport du Conseil fédéral (n. 79), 11; *B. Chappuis*, Moment du dommage (n. 7), N 607.

¹⁴⁶ *Von Segesser* (n. 22), 32.

¹⁴⁷ *Ripinsky/Williams* (n. 44), 174.

¹⁴⁸ *Bishop/Crawford/Reisman* (n. 76), 1359.

¹⁴⁹ ATF 130 I 337, c. 5.4.2 = JdT 2005 I 95; ATF 128 I 81, c. 2 = JdT 2004 IV 55; TF, *Zurich Assurances* c. D. S., SJ 1997 58; BSK-*Dolge*, ZPO 183 N 15.

Conclusion

Valuations are uncertain. Predicting the future cannot be reduced to a formula. The valuation of a company is, by nature, a theoretical exercise, based particularly on accounting and business management rules. As a result, any assessment of the damage caused to a company's value is partially based on theoretical data. The projection into the future of these assessments requires the use of economic formulae that take a court or arbitral tribunal to the edge of abstraction and sometimes provide a misleading impression of precision. However, the proper application of valuation tools put forward by competent experts and tested by party advocacy should help courts and arbitral tribunals reach results that fairly approximate real values in the market.

This abstract approach to assessing damage is nevertheless in line with the law on damage calculation. The DCF method is one way for a court or arbitral tribunal to accomplish its mission. While projecting future cash-flows of start-ups and early stage investments may be legitimately questioned, reasonable projections for going concerns with a certain track record are generally considered adequate when awarding compensation insofar as the risks associated with such a valuation method have been circumvented.

However, deciding authorities may not simply uphold the theoretical conclusion reached by a financial expert. Courts and arbitral tribunals must ensure the

suitability of the method in light of the facts of the case and, whenever possible, take into account all concrete elements that have been brought into debate by the parties.

Regardless of the efforts deployed, courts and arbitral tribunals will always struggle with the difficulties that exist in predicting the future and in objectively establishing the value of a company. This situation – which makes the outcome of litigation particularly unpredictable – should lead parties to include in any contract for the sale of a business a method to calculate its value and warranty provisions to determine, with as much accuracy as possible, the financial consequences of a breach of contract affecting the value of the company.

In conclusion, and in the light of the reluctance of some arbitral tribunals and courts to use the DCF method, we would point out that since no valuation method is perfect and applicable in all cases, it would be wise to employ, whenever possible, different methods of valuation. This practice, referred to as triangulation¹⁵⁰ (between Income-Based, Asset-based and Market-based), would help to avoid serious errors when awarding compensation to a successful claimant. As Mark Kantor explains, “[v]aluation methods are often complementary. If the valuations reached by two methodologies are widely inconsistent with each other, that can be a strong signal that something is awry. If several valuation methods produce consistent results, arbitrators can take greater comfort from the valuations”.¹⁵¹

¹⁵⁰ *Ripinsky/Williams* (n. 44), 235.

¹⁵¹ *Kantor* (n. 42), 27.