Fair Value and Discounted Cash Flows: Value Creation or Sense Destruction?

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Abstract The current contribution examines the limits of the Discounted Cash Flow methods, often denounced by Jacques Richard. We defend the idea that beyond the already famous shortfalls that the evaluation methods have demonstrated, those may extend when applied in a very different context, i.e. the one of financial reporting. Indeed the change of set, the loss of unity in capital budgeting decision and risk awareness may increase the potential misuses of the method. Finally, we demonstrate that the concept of infinite life loses consistency in such a framework.

The Discounted Cash Flow (DCF) as a potential measurement for Fair Value has nurtured the contemporary accounting debate, notably involving the international standard setter, and which Jacques Richard participated in by defending the necessity of a critical approach. To Jacques Richard, the current conflict is a sequel of an older one, started at the beginning of the industrial revolution and opposing the tenants of price-values reporting versus the defenders of cost-values reporting. The subtleties are numerous in accounting matters, and the previous sentence encloses at least two of them while in conflicting cases, terminology precision appears to be fundamental. In that unique debate, many definitions co-exist, which may not exactly coincide with economical or financial interpretations though they borrow their concepts. While we review those semantic tensions, we will also underline their implications.

This contribution first confronts the existing perceptions of values, prices and costs, all of them being candidates to measure an object. In a second part, the conditions for a rigorous application of DCF tools for an assessment of fair value are examined. As they are unfortunately rarely checked in real life cases, the second part reminds how much cautiousness must be exercised in results interpretation when applying the rules prescribed by the tools. The use of DCF methods indeed presents a double risk exposure: to the method itself and to the rules derived. As real life is undeniably likely different from a theoretical life, the use of the theoretical tools and the rules derived from theory can hardly be strictly applied and may

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D. Bensadon, N. Praquin (eds.), *IFRS in a Global World*,
DOI 10.1007/978-3-319-28225-1_7

require some balanced and prudent adjustments. Arguably, there is in the usage, room for the emergence of inner tensions, which may possibly harm the business. Our third part shows that the strict application of the rules may elude other important business decisions. The key decision factor is graphically represented versus what it hides, in order to bring arguments in favour of a greater awareness. At worst, beyond the technical limits of the methods, the strong focus on shareholder's value creation may hide embedded risks and become sense destructive. It is by this demonstration that we hope to pay a fair tribute to the work of Jacques Richard. In a last part, we seize another key topic to Jacques Richard et al. (2014): the treatment of the Goodwill by the International Standard Accounting Board (IASB). In the DCF framework, we show that the infinite life makes little sense. Globally, the chapter aims at formalizing arguments supported by Jacques Richard by expressing in a financial language.

1 The Circular Referential Triangle of Cost, Prices and Values

This section examines the concepts of cost-values to price-values as opposed in the introduction.

1.1 Cost, Value and Price Definition

A common mistake would be to exclusively understand cost-value as a theoretical managerial production cost while it can also represent the acquisition cost, i.e. the price paid to purchase a good, such as an asset. The cost is then deemed a realized price. Interestingly, cost-values are not necessarily different from a market price, whether the trading occurs over-the-counter (OTC) or via an exchange. Indeed, in a competitive market, the purchase price is a transaction price supposedly reaching equilibrium when supply meets demand. We come back to that notion below. The second pivotal concept is the one of a price-value, defined as an observed one on the market, i.e. a market-price, which therefore may only be observed and may not be realized. In such a case, the price-value describes the price at which a good could be virtually sold if the "owner" decided to do so. When seizing the (confusing) topic, accounting authors have also referred to the opposition between the entry price (realized purchasing price) and the exit price (potential sale value) (Nobes and Alexander 2005; Alexander 2005), in a dichotomy that appeared to be appealing to American and international standard setters. The subprime crisis exemplifies the difference.

In a cost-value economy, a borrower has access to a sum of money relative to the purchase price of the underlying good. If agent A wishes to become the owner of a 200,000 € house, he can only borrow a portion of that money. Likely if prudency applies; the portion size is proportional to the recurrent revenues which agent A perceives or earns. In a price-value economy, the situation starts the same way but is modified when market prices get higher. Let's assume that as an external impact of increased ease in access to property, the housing market experiences a raise in prices. Agent A now virtually owns a 400,000 € worth house. As in most of mortgage contracts, the real property simultaneously plays the role of security for the loan. Then, A's banker holds an optional value of 400,000 € and feels now comfortable with offering the possibility to increase the debt of agent A. The mechanism is very naïve: the house can virtually be sold back at 400,000 €, then it may generate that value, on average, a practice that has been identified as a cognitive mistake in capital budgeting (Savage 2009).

Two remarks follow: (1) the price-value based economies imply the acceptation of a convergence to the mean, (2) if one bets on an infinite price growth, there is less money to borrow in an entry-price economy than in an exit-price economy. In the latter case, when prices decrease, a crisis occurs and the market knows what is deemed a correction.

Likely, the price-value economy will experience bigger corrections than the cost-values economy. The process favouring more substantial money flows able to nurture the distance from the correction price is coined pro-cyclicity. Danjou, currently an IASB member (Richard 2004) once wondered '*if it is not better to avoid rushing to audacious accounting reforms*' in a period of instability of markets, all the more so when '*it is not clear that the shareholders want to read the value of their enterprise in the balance sheet*'. There is undeniably a dynamic interpretation of values in the price economy and a static one in the cost economy while dynamics may be source of volatility. Moreover, there is a widespread doubt about the trust in virtual values expressions, as compared to realized prices. We next discuss the accuracy of market prices as observed.

1.2 The Porosity of Accounting to Finance Reasoning has Favoured the Financialization of the Economy

From a financial point of view, and it should here be reminded that financial evaluation is an applied exercise in microeconomics, the settlement of a transaction signals the meeting of supply and demand. Following very basic economic theory, it is only when the transactions are numerous, in pure and perfect competition that the transaction prices converge to a market equilibrium price. Implied assumptions are numerous, they suppose: a large number of buyers and sellers, no barriers to entry or exit, perfect factor mobility, perfect information, zero transaction costs, profit maximisation, homogeneity of products, absence of externalities and agents' rationality. All those assumptions have been extensively discussed, notably by behavioural finance researchers (Kahneman 2011; Kahneman and Tversky 1979), whom demonstrated in length their little chances to be simultaneously checked, if checked at all.

In our accounting classes, there are huge chances that a transaction described as observable is understood as one that is realized. In other words, to the external observer, the price of the transaction is the main object of observation in an economy driven social system. Demand and supply meet a convergence point, which once the trading is done, becomes the realized price. There is to our knowledge no market for virtual prices able to reach an equilibrium price. More specifically, observed real prices allow the assessment of virtual prices while the reverse doesn't hold. If we replace virtual prices by values, we reach the idea that is generally accepted that a value is based on a price observation (prices allow to formulate values with transformation) but a value does not technically define a price, as the price is the meeting point of different values. Therefore, to most of our accounting students, a price or a cost is realized and past. On the contrary, a value is considered estimated, it is the idea that an economical agent develops to approach a potential price.

In financial evaluation classes, as many manuals and many auditing firms internal process will testify, the price settlement is reached when the values are fine-tuned by the negotiating parts whom alternatively have expressed and adjusted their self-estimated values. An interesting feature is derived from that widely adopted by practitioner's mechanism: the will to come to an agreement and exchange a good or a service has a strong impact on the final settlement price. In the latter paragraph, we are taking a significant distance from the terminology suggested during the industrial revolution: price-values have become values while cost-values are similar to prices. We also support the idea that intentions drive values while prices are testifying of realizations.

From those observations, we can precise the definitions which we will retain for the rest of the paper. Take two negotiating parts X & Y. X is selling the good G; Y wants to buy it. Costs represent the amount of money it takes to "buy" or "build" a good. At the beginning of the negotiation, only X can claim the existence of a cost for the good G. When a transaction is envisaged, a value is assessed and expressed as a desired selling price. Likely, the value for X is estimated on the basis of the cost information X possesses and on the extra-value that is associated to the good, and relying on external information (market price, shortage in G procurement…). On the Y side, another value is estimated as the contribution of the good G to operations may substantially differ from the one of X. The value assessed by Y likely includes most of the information that X integrated while X has little information about the destination of G for Y. The negotiation is undoubtedly an asymmetric game. If, and only if, an agreement is reached, likely after a potentially long bargaining process, a transaction will occur and the agreed value becomes a price. Eventually, the so called price will be different from the two values expected by on one hand the selling side and the other hand, the purchasing side, respectively X and Y. Assuming that value finally meets the condition to become a price, it also becomes a so-called exit-price (realized exit-price) to the seller and an entry price to the buyer. In the latter case, it is a cost. The circularity between costs, prices and values is now obvious. Each protagonist's stance evolves in a triangular space.

We are now turning to an important question: How does Y estimate the potential contribution of the good G to its operations? The asymmetrical part of the negotiation has many chances to be drawn from a business plan, which includes projected cash flows. Once the cash flows are estimated, the DCF methods deemed an appropriate substitute to a price-value (Richard et al. 2014, p. 63) can come into play. The latter analogy has been of great help in finance theory to resolve long lasting puzzles such as the Real Option Valuation since Myers coined it in 1977. It took more than two decades for Copeland and Antikarov (2001) to suggest the MAD (Marketed Asset Disclaimer) approach. In a very short explanation, the trick allows to evaluate a project by focusing on its future cash flows in place of the problematic alternative consisting in looking for a portfolio of similar assets on the financial markets. In this framework, the MAD approach tells a story written from the cash flow lines. Concretely, the MAD approach exactly recommends substituting a regulated market price by an over-the-counter price and considers the potential settlement price as defined between a company and itself. This makes a lot of sense in a financial perspective, in the unique scope of capital budgeting, as it offers to construct a collegial decision on a combination of strategic view, financial business plan and decision criteria relying on the same informational grounds. In such a case, the shortcut generates risks but the people allowing for the forecast bear the risk. There is no transfer of risk, but a conscious acceptation of it.

Once "the trick" is imported to an enlarged accounting information scope, it faces two main issues. Firstly, it is not anymore circumscribed to internal information used to build an internal shared vision and to decide to invest or not. Secondly, there is a shift in the type of decision and its location. Originally, the DCF based decision is a capital budgeting one, likely focused on real assets or a mix of real and financial assets; it is made inside the company, and part of a common to all dependant deciders investment portfolio, moreover sharing a strategy. When applied to financial reporting, it next becomes an investment decision, focused on financial assets, made outside of the company, with deciders being independent shareholders, holding an infinite variety of diversified financial assets portfolio, with potential opposite strategies.

The reasons why the DCF concept has penetrated the accounting area, ignoring those tremendous differences, may still require some investigations. Indeed, beyond the potential tautology, as any technical tool, DCFs require some precautions for not being led astray. A subsequent question could be: does the shareholder understand what story he/she is buying when deciding to invest on numerical story-telling basis?

2 Determinism as a Surrogate to Risk Recognition

It is the approach adopted in this contribution to examine the possible *unfairness* of the DCF methods and to subsequently suggest ways to moderate the conclusions that were held as sacred decision rules in the 1950s/1960s. As potential drivers of misleading, the convergence to the mean and the story-telling embedded in the use of DCF are addressed in this essay, which though critical, doesn't recommend to abandon the DCF methods but praises for an aware use. As it has been often stated: the most beautiful theory can only give what it has. Among those, we identified three shortfalls meeting Jacques Richard's concerns. The first one is linked to the already famous mathematical embedded limits in the DCFs. The second one illustrates how a gap between reality and virtuality can emerge by confronting NPV (Net Present Value) assessment to cash generation process, in a reasoning, which finds resonance with the dividend distribution puzzle. The last shortfalls open a discussion on the significance of an (im)possible infinite life concept.

2.1 The Slow Emergence of a Sophisticated Decision Tool

The DCF method, often deemed a heritage of the work of Irving Fisher and a building block of modern finance, has experienced a fast spread in the second part of the twentieth century, supported by a continuous advertising effort lead by scholars like Stonehill and Nathanson (1968) and their numerous followers, and also by its conceptualization power and the emergence of fast calculators (Bernstein 2008). However, despite the common belief that the method is as modern as modern finance can be, the DCF method doesn't root in neo-classical theory. In the origin there is the Fibonacci's work, undertaken seven centuries before the DCF methods were designated as the most performing capital budgeting criteria. The author, also known as Leonardo Pisano, had conceived the calculation method in his year 1202 Liber Abaci.

A question arises: why didn't the DCF evaluation tools breakthrough during this seven-century period? Is this inertia only a consequence of the inexistence of the necessary calculation tools? Indeed, DCFs became fashionable during a scientific era; they fit perfectly well in the early twentieth century glorifying deterministic models. With the emergence of the prospective school, especially on the European Continent, a shift to a less deterministic era surfaced in the 1950s. Although this chapter doesn't ambition to track a historical veracity, it aims at underlining how DCF may deviate from the business sense. Indeed, the authors are convinced that a late adoption of the DCF may betray its inadequacy with the vision that the deciders carry. The next sections bring arguments to support that conviction.

2.2 The Power and the Weaknesses of Conceptual Tools

2.2.1 DCFs Allow the Transposition of Money Amounts on the Time Scale

Modern finance theory as developed with capital markets has long celebrated the use of DCF methods for their ability to capture the time and inflation effects. Indeed, the famous "time is money" once coined by Rockfeller has deeply marked the minds and one can only recognize that a preference for receiving 100 € today likely wins over the idea of receiving 100 € in 1 year. To most of us, this phenomenon is captured in an easy mathematical calculation process which is called "compounding" when one desires to figure out how much 100 € today will be worth in a year (the future value) and "discounting" when one wants to assess the current equivalent of 100 € to be received or paid in a year or more. The method allows a translation of monetary amounts on a time scale under the very restrictive assumptions that (1) there is full certainty about the cost of money, (2) the interest rate, also coined the discounting rate, used in the model is known. Two basic formulas set the foundations of the methodology for all users, including accountants and finance practitioners.

$$VF = PV^*(1 + i)^n PV = VF/(1 + i)^n$$

With PV = present value, FV = future value, i = the discounting rate and n = the number of years

Those equations are used to compound (transform a PV in a FV) or discount (transform a FV in a PV) a single flow. A little more sophisticated formulae can help calculating the PV and FV of series of constant flows; they are useful to operations like the calculation PV of a retirement rent or to estimate the monthly payment which one needs to make to reimburse his/her debt. Another extension conceptualizes the dividend as the basis of a perpetual rent, and derives the share price, coined "the fundamental value", mobilizing the famous Irving Fischer and Gordon-Shapiro models.[1]

2.2.2 The NPV

In a real life project, like the purchase of G here before described, flows are likely not constant neither in value nor in time. To face such issues, it is possible to sum up

[1] The first one considers that the price of a share equates the discounted value of the future dividends, while the second adds the assumption of a constant dividend growth rate. Designed in the 1950s, the formulae fit a very flat non-volatile market. Other variations exist: the Bates and Modlowosky models are examples.

different flows (here below F), one after the other, as expressed at their individual (planned) deadlines. We then refer to a Net Present Value (NPV).

$$\mathrm{NPV} = F_0 + F_1 / \left((1 + i)^1 + F_2 / (1 + i)^2 + \ldots.. + F_n / (1 + i)^n\right.$$

A NPV therefore calculates the value of a sum of flows, each supposedly generated at the end of different exercises, in order to assess a global value, which represents the accumulation of the flows, but expressed in a current monetary amount. The discounting rate is a key factor in the model as it strongly influences the subsequent rule application. According to the NPV rule, a positive result represents the amount of money created by the project. It is sometimes described as the value destined to shareholders while a better description would be the one of the value created by the project for the company, and source of a potential shareholder wealth increase. On this basis, the NPV rule has been formulated: invest if the NPV is positive and when one needs to choose between several projects, invest in the one generating the highest NPV. Easily understandable are the underlying assumptions, which assume that the cash flows are already known, to the deadline, and are certain, moreover, the rule assumes that there is no doubt about the discounting rate all along the project life. This is typically a deterministic tool. What happens when the real life cash flows don't meet the estimated ones? Or when the interest rates suddenly increase, inevitably raising the discount rate? It doesn't change the project representation, because the NPV is never used as a follow-up tool, managers prefer using management control tools. This process may seem usual to most readers but its implication maybe more dramatic than expected. Indeed, NPV is a one instant decision tool, for a single go–no go choice. Astonishingly, five decades of usage haven't allowed any assessment of the NPV performance as a decision-making tool. Of little help to adapt the decision to a renewed context, a NPV follow-up would a minima permit the recension of mistakes.

2.2.3 The IRR

Another criteria has been derived from the same equation, by solving a null NPV, the discounting rate being unknown and the solution. Obviously, we are solving a polynomial. The criterion, called the Internal Rate of Return is supposed to capture the yearly profitability of a project. However, it also suffers shortfalls, which are widely described in the literature: there may be no or several solutions to a polynomial, the intermediary cash flows are assumed to be reinvested at the IRR rate. Therefore if the IRR was seen as convenient in the early times of DCF methods predominance, for its simplicity—anyone understands quite well an interest rate—the decrease of its use favoured the NPV adoption.

The DCF methods started to diffuse in the 1950s in the US and ever since, their rate of adoption has continuously increased (Blum 2011), as surveys prove, though most of them have been conducted in the USA. Chart 1 shows that consistently with

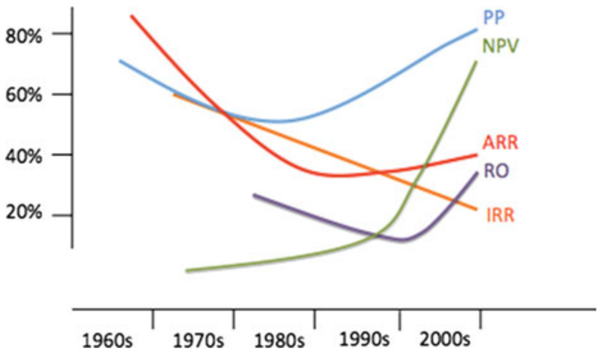


Chart 1 Adoption of methods as primary criteria in capital budgeting decisions. *PP* Payback Period (non DCF), *NPV* Net Present Value, *ARR* Accounting Rate of Return, *RO* Real Options, *IRR* Internal Rate of Return (*Source*: Blum 2011)

scholars' recommendations all along the decades, practitioners have slowly abandoned the Payback Period and the Accounting Rate of Return to prefer the DCF methods. Also observable is an inversion of adoption curves between NPV and the IRR which has lost popularity with time. For the above-mentioned reasons, more recent surveys show that if DCF methods remain popular in the USA, Real Options or Decision tree methods have become primary decision criteria in countries such as France or Germany. The latter are heritage of the prospective theory, which became very popular during the second half of the twentieth century and a sign of decline in the faith in deterministic models.

As the next paragraphs demonstrate, the described limits unfortunately may have some resonance in the real world when the conceptual models are strictly applied.

3 Tensions Between DCF Methods, Accounting and Real Business

3.1 Net Present Value: Short-Term Money for the Shareholder, Long-Term Trouble for the Business?

As their adoption rate grew, the DCF methods soon have been blamed responsible for poor decision-making and specifically they have been suspected of underinvestment for the following reasons: the problematic too high interest rates (Hayes and Abernathy 1980), the under values estimated with NPV computation (Dean 1951), the lack of interdependencies in between flows capture (Myers 1977), the poor usage made (Hodder and Riggs 1985).

Another accusation emerged quite early when the short-termism behaviour of the financial markets was first denounced (Hayes and Abernathy 1980), blaming the over attention given to shareholders. Short-termism has been characterized by Laverty (1996) as "*representing decisions and outcomes that pursue a course of* *action that is best for the short-term but suboptimal over the long run*". The next section offers an illustration of this trade-off.

Take a company having the choice between two mutually exclusive projects: project A and project B, which also have the same lifetime. Both require the same initial investment of 800, but the projects will generate different cash flow sequences (Table 1). A is a novel product: it scales up slowly and experiences a high-speed growth rate after a few years. B slightly improves the existing products and is expected to meet a known market that will slowly disappear. There is obviously an important strategic decision to make.

IRR rule states the following "choose the highest yearly profitability", following it, B should be the selected project. Setting a 10 % discounting rate, the NPV is respectively for A and B: 500 K€ and 344 K€ M. If we apply the NPV rule, A should be chosen. Making the tools more complex (adjusted NPV, adjusted IRR. . .) can solve the conflict in criteria, but one can also think through. NPV is a measure of the value at the end of the project life, it can also be computed at the end of each exercise in order to better capture its generation process. It is what Chart 2 represents. On the x-axis, one can find the end of exercises, on the y-axis, the cumulated discounted cash flows. When the curves cross the x-axis, the discounted Payback Period are readable, which is a bit further away in time than the non-discounted Payback Period.

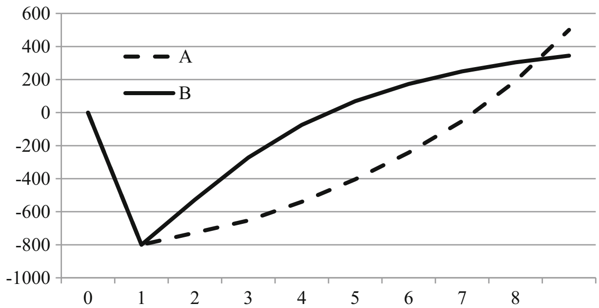
If the curve describes the NPV generation, it is also worth mentioning that the NPV is the very last dot of each curve. In other words, the NPV rule states that a decision should be made on the observation of a unique single dot, moreover, based on prospective uncertain data.

Concretely, the capital budgeting decision is not made on the observation of the whole life NPV generation, i.e. the entire curve, moreover a deterministic curve, but only on the hypothetical final result. Stating that the decider should select the

Table 1 Cash flows, in thousands € and IRR for projects A and B

Cash flows	0	1	2	3	4	5	6	7	8	NPV (10 %)	IRR
A	−800	80	90	150	200	260	338	473	662	500 €	20 %
B	−800	300	309	263	210	168	134	108	86	344 €	24 %

Chart 2 NPV generation process



project with the highest NPV is equivalent to measure the distance between the x-axis and the last dot of each curve. The longest positive distance wins. According to scholars, one should focus on the NPV, for the technical limits of IRR. In the above illustration, criteria (NPV & IRR) are conflicting. The best IRR matches the lowest NPV and reversely. Subsequently, project A should be selected.

But why is IRR lower for A? The whole chart provides some beginning of an answer: project A requires more money, the surface of the A curve below the x-axis is twice as big as the one of project B. What does theory tell about this? It stipulates that if a manager can convince funds providers that a project is profitable, then, the funds will literally flow. In other terms, finding cash is no big deal!

How true is that statement? To anyone operating in real life conditions, it is obvious that money doesn't flow just because a project is promising. The focus on NPV also eludes the potential of project B. By insuring a faster payback, it generates supplemental cash faster. This cash can be useful in at least two ways: avoid insolvency if possible on a consolidated/more global level, and invest in other promising projects. Indeed, project B allows the management to seize options.

Our illustration shows that the restriction of a choice to a single value frees the deciders of much information, i.e. the collection of preceding dots and the way they articulate with one another through time. This remark has two implications. The first lies on the little accuracy of the representation of a project by DCFs for the external reader. When reading only the NPV value, the curve cannot be guessed. The deterministic vision that the projections are assuming is not shown. In short, the story is not told. A focus on the final dot also eludes the cash flow needs (or availability) associated to the project. The second and subsequent implication may lie in the increase of informational asymmetry. Indeed, the one observing the last dot will lack contextualisation. Readers of financial reported information will experience this lack. NPVs and to a wider extent DCFs tell a story which may want to be accounted.

3.2 How to Share a DCF Story?

To allow DCFs to tell a story, the focus could be enlarged and questioned. Enlargement allows a more comprehensive view and would for example include the whole curve communication. Arguably, this will be a complicated solution. The French standard setter has once praised for the use of sensitivity analysis. We explore and complement this path in the following paragraph.

Sensitivity analysis to financial evaluators, especially when Anglo-Saxon, refers to the study of the NPV changes when an endogenous element varies. For example, one can increase a cost line by 10 % and observe that the impact on the NPV is a decrease of 25 %. This project would be more sensitive to the cost line than one which NPV would only be reduced by 5 %.

Limiting the study to endogenous variables is problematic in the interwoven world we are living in. When examining exogenous factors, Anglo-Saxons usually refer to scenario analysis. This will for example test the impact of a variation in a commodity price. An interesting approach would be to combine the two and observe the NPV variation for a series of significant variables. A tornado diagrams, that exposes the impact of 10 % changes in each variable would provide information in easily understandable way.

But we believe that this is not enough, if forward-looking information is to be communicated, an effort to describe the risk global exposure, and not only the elasticity of the NPVs, would allow a better awareness from the investor. One solution could rely on the provision of a fluctuation range of the NPV. The lower end of NPV would be computed through a ruin test, answering to the following question: what if the project doesn't work at all? At the highest end, the optimistic vision of the manager could be expressed, as long as this highest end is reachable to the company.

Therefore, even though DCFs carry many shortfalls, they may carry information to the shareholders but the standard setters should insure that the reported values don't focus on a hypothetical long-term outcome but are telling the managerial story, the strategy behind the investment. Of course, this recommendation focuses on numerical estimations and does not imply that figures will do better than detailed narratives. The alternative option contributions should be examined apart.

Our third part demonstrated through a very simple example that DCF methods and namely NPV lack the capture of what is the sense of business and the strategic reasons justifying the investment. NPVs tend to hide the true trade-offs. To avoid the pitfall, we suggest that figures provided enlarge their scope to capture a comprehensive representation of a project life, and therefore provide with a reliable transcription of the underlying strategy. On the topic linking strategy and project life, some current accounting practices admit the existence of an infinite/indefinite life. With DCFs, we now survey that idea.

3.3 Is Infinite Life an Impossible Concept?

In the last part of this contribution, we show that the infinite life concept as advanced by the international standard setter lied on pillars of sand regarding DCF. The infinite life is widely used in finance models since Irving Fischer who first considered that the price of a financial asset was the current value of the series of upcoming everlasting dividends.

This value is simple to estimate: it is a ratio with the perpetual constant cash flow value for numerator and the discounting rate for denominator. A constantly growing cash flow is also assumable; the denominator then represents the difference between the discounting rate and the growth rate, with the mechanical limit that the first should be bigger than the second.

In the following table, with a simple exercise, we show how neglectable cash flows become after a given date, which depends on the discounting rate (i). To conduct that demonstration, we first compute the Present Value (current value) of a

Table 2 Present values of a perpetual cash flow of 1000 € and corresponding finite horizon of a finite series of 1000 € cash flow

Discounting rates	2 %	3.5 %	5 %	10 %	15 %	20 %	25 %
C/i	50,000	28,571	20,000	10,000	6667	5000	4000
n	−35	−20	−14	−7	−5	−4	−3

Annuity formula: $PV = C/i * (1 - (1 + i)^{-n})$

series of 1000 € worth perpetual flow (C), using the perpetual rent formula (C/i). The results show sensitiveness to the discounting rate assumptions: when we apply a 2 % discounting rate, the present value is 12 times bigger than when discounted at 25 %.

Next, we use the annuity formula to assess the necessary number of years (n) to obtain the same present value but with a finite series of 1000 € constant cash flow (Table 2), rather than an infinite horizon. Technically, the perpetual rent is the asymptotic limit of the PV formula when n is infinite. Therefore, we can observe that the perpetual rent converges with the finite rent formula. The lowest is the interest rate, the most remote is the convergence point. If one can perpetually invest 1000 € every year at 5 %, the current value of the rent is 20,000 €. The current value of a 1000 € per year investment is also 20,000 € if the deadline is 14 years, and with the same 5 % rate. The very simple explanation of that convergence relies on the fact that any flows invested in years 15 or later have absolutely no meaning in terms of “money of today”.

There is in that demonstration some useful insight for accounting matters: the above example shows that there is no such thing as an infinite value. Indeed, after a given number of years, which can be easily defined, the future flows don’t bring any supplemental value to the current value.

4 Conclusion

The quest for international or worldwide accounting standards have through the past four decades conducted to a renewal in the concepts underpinning the rules or standards to apply. Amongst them, the measurement debate has been vivid, and particularly Fair Value and its three associated levels. Fair Value can be equivalent to a liquid market price, a comparable price or an entity based model value. In the latter case, the value estimation has many chances to mobilize the DCFs. Jacques Richard has through the last years expressed some concerns regarding Fair Value and specifically, DCFs. The current contribution pays tribute to the author in bringing further arguments and illustrations of the tensions that an improper and unaware use of DCF may nurture.

The importation of financial tools to accounting applications is possible, but also full of traps, relative to the technical underlying assumptions and the hidden structure of the calculation. We have shown that the use of NPV concentrates the decision on a single final projected dot rather than the global cash flows. This shortfall appears to be a vital issue for a company seeking funds, as it may mask a short or medium term lack of cash behind a remote expected value. Indeed, DCF rules don't necessarily meet "good business sense" which of course implies a dose of prudence, or at least a measured risk exposure. Likely, this gap between a future value representation and real life conditions where a price is to be paid for mistakes may explain a delayed adoption of the DCF tools during seven centuries. It also justifies its slow abandon in some places of the world, such as France or Germany. This contribution clearly calls for precautions in the DCF interpretation if one wants to avoid to unnecessarily jeopardize the business continuity. DCFs as deterministic methods can be mitigate by sensitivity and scenario analysis, the combination being a simulation analysis. The provision of the range between the best case and the worst case (the failure of the project) likely will help the stakeholders to capture the risks they are taking. The solution is not perfect but much less risky than the focus on a single only potential dot.

Another topic discussed is the infinite life brought forward by the IASB. It appears—in DCF terms—that it crystallizes other tensions. Precisely, the recognition of a possible infinite life assumes that any cash flows, even the most remote ones have an impact on a current value. This, we have shown, is non-sense, even within a low interest rates context.

The scope of the article is too short to move to specific cases, but future arguments could focus on the weight of environmental externalities on the NPV calculation, which as computed today, completely eludes the question through the practice of a narrow focus. Human capital capture is another field of potential practice. The latter suggestions will come back to our of costs, values and prices initial triangle.

Eventually, the main contribution of this essay relies in the demonstration that though the IASB claims the service of a better economical representation, it may sometimes move further away from the real business world than the norms and standards they once intended to better replace.

References

Alexander D (2005) Fair value: concept and IFRS regulation. In: Alexander D et al L'evoluzione del bilancio di esercizio e l'introduzione dei principi contabili internazionali (IASB). Giuffré, Milano

Bernstein P (2008) Des idées capitales. Quadrige, Paris

Blum V (2011) Five decades of capital budgeting surveys for a contextual approach. Accounting Renaissance. IAAER, Venise

Copeland T, Antikarov V (2001) Real options: a practitioner's guide. Texere, New York, NY

Dean J (1951) Capital budgeting. Columbia University Press, New York, NY

Hayes R, Abernathy W (1980) Managing our way to economic decline. Harvard Business Review July–August:67–77

Hodder JE, Riggs HE (1985) Pitfalls in evaluating risky projects. Harv Bus Rev 63(1):128–135

Kahneman D (2011) Thinking, fast and slow. Allen Lane, coll. « AL TPB »

Kahneman D, Tversky A (1979) Prospect theory: an analysis of decision under risk. Econometrica 47(2):263–291

Laverty K (1996) Economic short-termism: the debate, the unresolved issues, and the implications for management practice and research. Acad Manage Rev 21(3):825–860

Myers SC (1977) Determinants of corporate borrowing. J Financ Econ 5:147–175

Nobes C, Alexander D (2005) Financial accounting: an international introduction. Pearson, London

Richard J (2004) The secret past of fair value: lessons applied to the French case. Account Eur 1:95–107

Richard J, Bensadon D, Colette C (2014) Comptabilité financière, IFRS versus normes françaises, 10th edn. Dunod, Paris

Savage S (2009) The flaw of averages: why we underestimate risk in the face of uncertainty. Wiley, Hoboken, NJ

Stonehill A, Nathanson L (1968) Capital budgeting and the multinational corporation. Calif Manag Rev 39–54