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Cross-border DCF valuation in a nutshell

Andreas Schueler*

The papers deals with cross-border DCF valuation. It focusses on key choices the valuator has to make: should the foreign currency (FC) or the home currency (HC) approach be used? How should a valuator deal with the covariance between cash flows and exchange rates? In doing so, the paper addresses inter alia the prerequisites and consequences of using forward exchange rates, reveals a tax effect on repayments, and questions the use of constant discount rates.

1. Introduction

It is common knowledge that flexible exchange rates vary over time. It is also clear that conducting business abroad is relevant for many firms. As shown in Table 1, there are a large number of household names in the corporate world which engage in significant business.

Table 1. Relevance of business abroad; Transnationality Index (TNI): average of foreign assets/tot. assets, foreign sales/tot. sales and foreign employment/tot. employment; 2019; Source: UNCTAD: United Nations Conference on Trade and Development, https://unctad.org/node/29280

Corporation	Home economy	Assets ($MM)		Sales ($MM)		Employment		TNI in %
		Foreign	Total	Foreign	Total	Foreign	Total	
Royal Dutch Shell plc	UK	376 417	402 681	276 518	331 684	59 000	83 000	**82.6**
Toyota Motor Corporation	Japan	307 538	485 422	187 768	275 390	227 787	359 542	**65.0**
BP plc	UK	259 860	295 194	215 203	278 397	58 900	72 500	**82.2**
Softbank Group Corp	Japan	253 163	343 306	29 286	56 910	55 272	74 953	**66.3**
Total SA	France	249 678	273 865	137 438	175 985	71 456	107 776	**78.5**
Volkswagen Group	Germany	243 469	548 271	227 940	282 776	374 000	671 000	**60.3**
Anheuser-Busch InBev NV	Belgium	192 138	237 142	44 352	52 251	148 111	171 915	**84.0**
British American Tobacco PLC	UK	184 959	186 194	25 232	32 998	31 196	53 185	**78.2**
Daimler AG	Germany	179 506	339 742	163 875	193 357	124 842	298 655	**59.8**
Chevron Corporation	USA	172 830	237 428	75 591	140 156	22 800	48 200	**58.0**
Exxon Mobil Corporation	USA	169 719	362 597	123 801	255 583	35 058	74 900	**47.4**
Vodafone Group Plc	UK	168 394	184 253	42 530	49 971	58 429	68 724	**87.2**
EDF SA	France	155 021	340 692	30 625	79 827	34 381	165 790	**34.9**
CK Hutchison Holdings Ltd	Hong Kong, China	143 367	155 523	32 556	38 163	279 000	300 000	**90.2**
Honda Motor Co Ltd	Japan	143 180	188 541	116 150	137 382	153 215	219 722	**76.7**

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Companies with business abroad, or more generally, cash flows denominated in foreign currency (FC) must be valued occasionally or on a regular basis due to - for example - M&A-activities, taxation, transfer pricing, impairment tests, or restructuring.

Cross-border valuation of companies has been analyzed extensively - for example - regarding the expected rate of returns for shareholders (cost of equity), and a number of textbooks address cross-border valuation: Bekaert and Hodrick (2018), Chapters 15 & 16, Berk and DeMarzo (2020), Chapter 31, Brealey et al. (2019), Chapter 27, Holthausen and Zmijewski (2020), Chapter 17, and Koller et al. (2020), Chapter 27. However, when it comes to be specific and comprehensive on how to link the literature on company valuation with that on macroeconomics in order to come up a with a DCF framework that works for cross-border valuation, the literature thins out considerably (see Schueler 2021 for a more extensive literature review).

This paper will provide an overview of the key considerations or inputs in cross-border valuation.[1] I would like to point out some conceptual choices faced by the valuator (Section 2), and present some recommendations regarding the DCF framework using two numerical examples (Section 3). Section 4 concludes.

2. Conceptual choices

I am assuming a two-country-setting, relevant currencies are the home (domestic) currency (HC) and the foreign currency (FC). Direct quotation is used, i.e. the price for one unit of FC is quoted in HC. The valuation is done from the perspective of a domestic investor, and company value is to be denominated in HC. Risk is priced according to the global CAPM. This requires the relative purchase price parity to hold (see Koller et al. 2020, p. 514, Bekaert and Hodrick 2018, p. 569, Stulz 1995, p. 12). Covered interest parity and the international Fisher hypothesis are assumed to hold as well. Domestic and foreign corporate income is subject to a constant and identical corporate tax rate. Neither personal income taxes nor barriers to repatriation of cash flows are considered here.

First, the valuator must choose between the FC approach and the HC approach. Applying the former require cash flows in FC to be discounted by the risk-adjusted discount rate (RADR) in FC. The resulting company value in FC (V_{FC}) is then to be converted into HC by the spot exchange rate at the valuation date (S_0) to get to the company value in HC (V_{HC}). The latter requires the cash flows in FC to be converted into HC by the expected spot exchange rates before they are discounted by the RADR in HC, leading to the company value in HC at the valuation date.

The second and the third choice apply only to the HC approach:

Secondly, the valuator must decide how to address the covariance between the cash flows in FC and the exchange rates. The amount and timing of cash flows in FC depend on the foreign exchange rate on a regular basis. Just consider the case of an exporter in a foreign country. If the valuator derives the RADR HC from the RADR FC, the covariance of the RADR FC and the exchange rates has to be taken into account as well. These covariances do not occur if the FC approach is used and cash flows in FC are discounted by RADR in FC. There are (at least) three options for the HC approach: (a) neglect the covariance of the cash flow with the exchange rates, justified by a deliberate estimate of its (negligible) relevance, and use the RADR in HC; (b) neglect the covariances in both the cash flows and the RADR which can be shown algebraically, or (c) consider the covariance in the cash flows while converting them into HC and use the RADR in HC. The proof that (b) is indeed possible, can be found in Schueler (2021). Please note that option (b) requires the use of the RADR FC multiplied by the expected change in the exchange rate. There is a fourth option (d): use forward exchange rates as the certainty equivalent of the expected spot exchange rates. Covariances are not relevant for (d), too. Since (d) needs to be elaborated in greater detail, I am covering it within the following discussion of the third conceptual choice.

Third, the valuator must decide how to determine future exchange rates for converting the cash flows in FC into HC. Theory has taught us that for valuing risky cash flows for risk averse investors we could use either expected values or certainty equivalents. This applies to exchange rates, too. We can use either expected exchange rates or forward exchange rates, because forward exchange rates are the certainty equivalents of expected exchange rates. The choice affects the RADR to be used. How can we determine expected exchange rates? As exchanging major currencies is a multi-billion business, we should refrain from guessing these rates nor accepting the guesses of others, like managers, bankers, or analysts. The international parity conditions provide a solution: the relative purchasing power parity (rPPP) establishes the link between the expected inflation rates in both countries

[1] It is based on a presentation by the author at the EACVA conference on business valuation in March 2021, and another paper of the author (Schueler 2021) that contains a more fundamental and technical discussion of the topic. The author wishes to thank the participants of the conference and especially the reviewers of Schueler (2021).

and the expected exchange rate. Therefore, if we could obtain reliable estimates of the expected inflation rates over the forecast horizon, we could derive the expected exchange rates. However, the expected inflation rates might be difficult to find, particularly for a long-term forecast horizon. The uncovered interest parity (UIP) together with the unbiasedness hypothesis (UH) establish a link between the risk-free interest rates in both countries and the forward exchange rates that are set equal to the expected forward exchange rates. There exists intense discussion about whether we can assume the UIP to be valid. We cannot answer that question here. I would rather point out that we could either use the forward exchange rate as a starting point to estimate the expected exchange rate by adding a risk premium, because the certainty equivalent plus the risk premium equals the expected value in general. Then, one needs to come up with an estimate of the risk premium, if it is not negligible. Or, one could treat the forward exchange rates as certainty equivalents. Then, the appropriate discount rate is the RADR in FC multiplied by the ratio of the risk-free interest rates in both countries (1 added to each of both).

To summarize, the use of forward exchange rates can be justified in several ways. The valuator must make clear which reasoning applies to the valuation at hand because this affects the definition of the RADR to be used. In this context, a table shown in Ruiz de Vargas (2018) is helpful, since it illustrates that data on forward exchange rates is readily available (Table 2).

Table 2. Data on forward exchange rates; CCY - currency; ECB - European Central Bank; B - Bloomberg, spot rate; C - Bloomberg, contributed or cross-calculation; IN - Bloomberg, interpolated; CIP - Bloomberg, calc. through covered interest parity ; D - Datastream; CIP stands for covered interest parity, i. e. forward exchange rates calculated by multiplying the current spot exchange rate by the ratio of the risk-free interest rates in both countries (1 added to each of both); Ruiz de Vargas (2018)

CCY	Spot rate	Forward exchange rates														
		6M	1Y	2Y	3Y	4Y	5Y	6Y	7Y	8Y	9Y	10Y	15Y	20Y	25Y	30Y
AUD	ECB/B/D	C,D	C,D	C,D	C	C	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
DKK	ECB/B/D	C,D	C,D	C,D	C	C	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
HKD	ECB/B/D	C,D	CIP, D	CIP, D	CIP	CIP	CIP, D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
ILS	ECB/B/D	C,D	C,D	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
JPY	ECB/B/D	C,D	C,D	C,D	C	C	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
CAD	ECB/B/D	C,D	C,D	C,D	C	C	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
NZD	ECB/B/D	C,D	C,D	C,D	C	C	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
NOK	ECB/B/D	C,D	C,D	C,D	C	C	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
SEK	ECB/B/D	C,D	C,D	C,D	C	C	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
CHF	ECB/B/D	C,D	C,D	C,D	C	C	C,D	IN	IN	IN	IN	C	CIP	CIP	CIP	CIP
SGD	ECB/B/D	C,D	C,D	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
GBP	ECB/B/D	C,D	C,D	C,D	C	C	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
USD	ECB/B/D	C,D	C,D	C,D	C,D	C,D	C,D	C	C	C	C	C	CIP	CIP	CIP	CIP
CNY	ECB/B/D	C,D	C,D	C,D	IN	IN	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
INR	ECB/B/D	C,D	C,D	C,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP
RUB	ECB/B/D	C,D	C,D	CIP,D	CIP	CIP	CIP,D	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP	CIP

3. DCF framework

There are some requirements for implementing cross-border DCF valuation by one of the three major variants of DCF (Adjusted Present Value APV, Flow-to-equity FtE, WACC). Due to the necessity to exchange cash flows in FC into HC and to define the RADR accordingly, especially the HC approach is affected by them.

For both FC and HC approach it should be noted that tax effects due to debt financing not only consist of the well-known *tax shield on interest expenses* generated by subtracting interest expenses from taxable income, but also, a tax effect related to the repayment (RP) of debt that must be considered as well if a domestic company is using debt denominated in FC. Depending upon the development of the exchange rate between the point of time the debt was received (period s) and it has to be repaid (period t), taxable income might be reduced if the repayment of FC-debt

converted into HC exceeds the amount of initial debt financing in HC, or taxable income might be increased if the repayment in HC is lower than the initial amount of debt in HC. Calculating this *tax shield on repayments* starts with the HC approach, but also needs to be considered for the FC approach. It might look a bit awkward to first compute the effect by converting debt-related cash flows originally denominated in FC into HC and then back to FC. But it is necessary, because the cash impact of that tax shield would be overlooked in the FC approach otherwise. Table 3 shows an example for a domestic company that uses debt denominated in foreign currency. We assume that the domestic tax regime requires the currency effects of repayments to be considered in the taxable income.

Table 3. Tax shields on debt denominated in FC employed by a domestic company; corporate tax rate 30%

Year (t)		**0**	**1**	**2**	**3**	**Sum**
Exchange rate (HC/FC)	HC/FC	0.95	0.90	0.80	0.70	
Exchange rate in t vs. 0.95	HC/FC		0.05	0.15	0.25	
Debt	FC	90.00	60.00	30.00	0.00	
	HC	85.50	54.00	24.00	0.00	
Interest (4 %)	FC		3.60	2.40	1.20	7.20
	HC		3.24	1.92	0.84	6.00
Tax shield on interest expenses	HC		0.97	0.58	0.25	1.80
Repayments	FC		30.00	30.00	30.00	90.00
	HC		27.00	24.00	21.00	72.00
Applied to repayment = increase in taxable income	HC		1.50	4.50	7.50	13.50
Tax shields on repayments	HC		-0.45	-1.35	-2.25	-4.05
Total tax shields	HC		0.52	-0.77	-2.00	-2.25

For this example, we assume a decreasing expected HC/FC-exchange rate. This leads to negative tax shields on repayments that results in negative total tax shields. The sum of the repayments in HC (72) is smaller than the debt in t=0 denominated in HC (85.5), representing the cumulated (13.5) effects on taxable income.

If the HC approach is to be applied, the RADR must fit to the decision of the valuator about how to convert the cash flows in FC into HC, as we discussed in section 2. For the sake of simplification, I am only focusing on the case that cash flows are converted by forward exchange rates here, treating them as certainty equivalents. Thus, we neither assume exchange risk premia to be negligible nor the UIP to hold. In this case, the RADR to be used, labelled RADR*, is the RADR in FC adjusted by the risk-free interest rates i (plus 1) of both countries:

$$RADR^* = \left(1 + RADR_{FC}\right)\frac{1+i_{HC}}{1+i_{FC}} - 1 \quad (1)$$

Table 4 illustrates this for a simple valuation of an unlevered company, i. e. a company that is financed by equity only.

Table 4. FC approach and HC approach for valuing an unlevered company with a lifespan of 3 years using forward fx rates and RADR*; constant yield curves in both countries (i_{FC} = 1%; i_{HC} = 2%)

Year (t)		0	1	2	3
FC approach					
FCF	FC		100.00	110.00	120.00
RADR	FC	7.0%			
Value	FC	287.49			
Spot fx rate	HC/FC	0.95			
Value	HC	273.1			

HC approach					
Forward fx rate	HC/FC		0.9407	0.9315	0.9223
FCF	HC		94.07	102.46	110.68
RADR =					
$RADR_{FC}$ x $(1+i_{HC})/(1+i_{FC})$		5.95%			
Value	HC	273.1			

This simple example illustrates that even if the HC approach is used, the RADR has to be adjusted starting from the RADR in FC. One could argue that the valuator should simply stick with the FC approach. If a RADR in HC is derived first (or top-down), one has to keep in mind that it implies a premium for exchange rate risk and might not be applied to cash flows converted by forward exchange rates in every case. Rather, it requires the exchange rate risk premium to be negligible or the UIP to hold.

The example is also simple in that regard that we assume the risk-free rates in both countries to be constant over time. If they were not, the risk-free rates used for deriving the RADR in both countries would need to be based upon forward interest rates. Otherwise, the reconciliation between FC and HC approach would be impossible. The reason for that being that the forward exchange rate F for periods $t > 0$ depend upon the forward interest rates (S_0 being the current spot exchange rate):

$$F_t = S_0 \frac{\prod_{\tau=1}^{t}\left(1+i_{HC|\tau-1,\tau}\right)}{\prod_{\tau=1}^{t}\left(1+i_{FC|\tau-1,\tau}\right)} \quad (2)$$

Finally, the example is simplified, because the company is assumed to have a life-span of only 3 years. In practice, companies are assumed to exist forever, unless we know that their lifespan is limited. Therefore, I would like to point out that the growth rate to be used for deriving the terminal value needs to be derived while keeping the change of the exchange rate in mind. If forward exchange rates are used to convert the cash flows in FC into HC, for example, we could split up the growth rate g to be applied to the converted cash flows (HC approach) as follows:

$$g_{FCF,HC,F} = \left(1+g_{FCF,FC}\right)\frac{1+i_{HC|T-1,T}}{1+i_{FC|T-1,T}} - 1 \quad (3)$$

If a levered company is to be valued the relation shown in (1) can be applied to the RADR needed for the DCF variant chosen. For the WACC (FCF) approach, the WACC in FC has to be adjusted accordingly. For the FTE approach, the levered cost of equity has to be adjusted. The principle remains the same. Unfortunately, things can quickly become complicated, because the financial risk, the risk of default and the risk of the tax effects induced by debt financing. All three would need to be addressed properly. These issues are discussed in Schueler (2021), but are beyond the scope of this paper.

4. Conclusions

We categorize our conclusions into those related to the valuation method, those related to the cash flow to be discounted, and those related to the RADR:

Valuation method

- FC or HC approach: in general, the FC approach avoids most of the challenges imposed by exchange rates, since the exchange rate is only relevant for converting the present value in FC into HC by using the observable current spot exchange rate. Covariances need not be addressed, and future exchange rates need not be estimated. However, there might be valuation cases for which the discount rate (RADR) in FC is not easily derived. Otherwise, it might be easier in practice to convert a stream of cash flows in FC or sporadic FC-cash flows into HC, thereby following the HC approach, and integrate it in the overall cash flow forecast for the cash generating unit, business unit or company. Another practical example for which the HC approach might be easier, is a domestic company that uses debt financing in FC. As previously mentioned, this also enables the valuator to address the tax shields on repayments caused by changes in the exchange rate in a more straightforward manner.
- Choice between different DCF variants: the popularity of the WACC approach, also referred to as FCF approach, stems from the possibility to use constant cost of capital (WACC) if the leverage ratio (capital structure) can be assumed to be constant. For a cross-border valuation, the need to use forward interest rates to establish consistency between FC and HC approach, and the tax shields on repayments question the robustness of this as-

sumption even for the FC approach. The valuator should consider to follow the APV approach.

Cash flow forecast

- Additional tax effect: the repayment of debt in foreign currency used by a domestic firm can lead to a tax effect in addition to the well-known tax shields on interest expenses. This tax shield on repayments occurs, if the exchange rate has changed between the period the debt financing has been received and the period a repayment occurs.
- Covariances: if cash flows in FC are correlated with exchange rates, the covariance between these variables needs to be considered. If it can be assumed to be small, it might not be of relevance for the valuation result and could be neglected. Other than that, there is the possibility to skip it and to use a RADR also without considering the covariance, or to use forward exchange rates.
- Future exchange rates: this problem arises for the HC approach. Forward exchange rates are an important point of reference for estimating future exchange rates. They can be interpreted in general as the certainty equivalent of the unknown future exchange rates. Therefore, they could be treated as certainty equivalents directly, or an exchange risk premium could be added to them resulting in the expected exchange rates. If one assumes the UIP to hold or the exchange risk premium to be neglectable, forward exchange rates serve as a direct proxy for the expected exchange rate. Another possibility to estimate the expected exchange rate is compound the current spot exchange rate by the ratio of the expected inflation rates (1 added to each of them). Although that sounds tempting and is in line with the relative purchase power parity, practitioners might encounter difficulties in coming up with mid and long-term estimates of the yearly expected inflation rates in both countries.
- Growth rate for the terminal value: for the HC approach, the rate of change in exchange rates has to be considered besides the growth in FC-cash flows. If forward exchange rates are used, the latter rate of change is determined by the ratio of one plus the risk-free rates. The valuator should first estimate the growth in FC-cash flows and then consider how to address the change in exchange rates for the terminal value.

RADR

- Risk-free rate: the use of yearly forward interest rates is necessary to ensure the equivalence between the HC and the FC approach. Valuators should not use a "one size fits all" constant risk-free rate.
- RADR depend upon the way to estimate future exchange rates within the HC approach: if the valuator is able to determine expected spot rates, the RADR in HC has to contain a premium for exchange rate risk. If forward exchange rates are used, the "regular" RADR in HC can be used only, if the exchange rate risk premium is assumed to be negligible or the UIP is assumed to hold. If forward exchange rates serve as certainty equivalents, the RADR in FC adjusted by the ratio of interest rates (1 added to each of them) is to be used.
- Interpretation of RADR empirically derived for the company or the peer group: if the RADR in HC is estimated empirically without any risk adjustments, it contains inter alia a premium for the exchange rate risk implicitly. The same is true analogously, if the RADR for the firm to be valued is derived by referring to the beta values for comparable companies (peer group). These beta values contain premia for the exchange rate risk from the perspective of each peer company. The valuator should keep this in mind while implicitly applying these risk premia to the company to be valued.

Although the paper provides only an overview about cross-border valuation, it might be helpful in increasing the awareness regarding the choices, challenges and pitfalls for valuation practitioners.

5. References

Bekaert G, Hodrick R (2018): International financial management, 3rd edn. Cambridge University Press, Cambridge.

Berk J, DeMarzo P (2020): Corporate Finance, 5th edn. Pearson Education Limited, Harlow.

Brealey RA, Myers SC, Allen F (2019): Principles of Corporate Finance, 13th edn. McGraw-Hill, New York.

Drukarczyk J, Schüler A (2021): Unternehmensbewertung, 8th edn. Vahlen, München.

Holthausen RW, Zmijewski ME (2020): Corporate Valuation: Theory, Evidence & Practice, 2nd edn. Cambridge Business Publishers, Cambridge.

Koller T, Goedhart M, Wessels D (2020): Valuation: Measuring and Managing the Value of Companies, 7th edn. Wiley, New Jersey.

Ruiz de Vargas S (2018): Prognosemethoden für marktdeterminierte Wechselkurse bei rechtlich geprägten Unternehmensbewertungen. BWP 2/2018: 34-49.

Schueler A (2021): Cross-border DCF valuation: discounting cash flows in foreign currency. Journal of Business Economics 91:617-654.

Sercu P (2009): International Finance: Theory into Practice. Princeton University Press, Princeton.

Stulz RM (1995): The cost of capital in internationally integrated markets: The case of Nestlé. Europ Financ Manag 1:11-22.

Level 3 reporting quality: trend analysis of derivative instruments' restatements

Joel M. DiCicco* - Richard S. Gendler** - Uliana Filatova*** - Teodora Minkova****

This paper addresses the area of financial restatements in the field of derivatives and hedging. First, the concept of the fair value hierarchy is discussed to set the stage for the analysis conducted. We explain what Level 3 derivatives are and their lack of transparency. Afterwards, we describe the differences between the financial usage of the term derivatives versus the accounting definition per Accounting Standard Codification (ASC) 815. This distinction will have an impact on the analysis as our research will be limited to the accounting definition. Afterwards, a literature review was conducted to gain the latest research in fair value accounting and Level 3 financial reporting. The authors then proceeded to conduct research governing trends in financial restatements and to ascertain the areas of weaknesses in derivative methodologies. There were several findings noted: 1) The small market capitalization companies had more restatements than the larger capitalization companies, 2) As expected, financial services led the way with most restatements in the derivatives/hedging area, and 3) There is a decreasing trend with restatements with regards to derivatives/hedging. With the information gathered from this research, we direct our research into interest rate derivatives and attempt to ascertain the flaws noted in this arena.

History of the fair value hierarchy

Accounting is no longer what it used to be. We all learned initially about the historical cost principle, which suggested that companies must record their assets and liabilities at the acquisition price. Further, at today's colleges and universities, we still elaborate in introductory accounting courses that the historical cost principle is one of the bedrock principles of accounting. However, upon further explanation, this principle is on shaky grounds as accounting is in effect implemented a "mixed-attribute system" whereby balance sheet figures are "valued" with varying methodologies. Some of these techniques would be net realizable value, lower cost or net realizable value, fair value, etc. [1]. The fair value methodology and its subjectivity is the focus of this paper.

In terms of fair value, in 2006, the FASB established a fair value hierarchy through the issuance of FASB Statement 157, now codified under the Accounting Standards Codification 820 [1, 2]. As part of this new standard, a fair value hierarchy was established to promote reporting consistency and transparency of fair value measurements. In so doing, the FASB created three levels of input data for determining the fair value of an asset or a liability. In general, the essence of the standard regarding hierarchy is presented as follows:

- Level 1 inputs are quoted prices in active markets for identical assets or liabilities that the entity can access at the measurement date. In general, this quoted market price in an active market illustrates the most reliable evidence of fair value [1-4].
- Level 2 inputs are inputs other than quoted market prices included within Level 1 but are observable, with some effort, for the asset or liability [1-4]. Examples would be interest rate swaps and rental rates for office buildings.
- Level 3 inputs are unobservable inputs for the asset or liability. Unobservable inputs are used to measure fair value to the extent that relevant observable inputs are not available. Usually, a firm would use its own data to determine the appropriate valuation whole, keeping in mind that under the fair value regime, the firm still needs to consider all information about market participant assumptions reasonably available [1-4]. An example of Level 3 is the valuation of private businesses and exotic options.

The key to this understanding is that the hierarchy focuses on inputs rather than valuation techniques.

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Under ASC 820-10-35-38, however, it is understood that the actual availability of inputs and their relative subjectivity might dictate the valuation technique used. For instance, in valuing a private business, the only inputs available are predominately unobservable inputs as there are no actual markets for trading privately held companies. In a perfect world, FASB and for this matter, IASB would seek all valuations using Level 1 quoted prices for all valuations, but as we know, that is quite unrealistic. In the world of complex derivatives, Levels 2 and 3 are the most dominant. With this in mind, how accurate are Level 3 valuations? This paper will probe this question by reviewing the financial statement "reissuance restatements" by the firms. While recognizing this would be limiting the population to publicly traded corporations, it is a useful gauge of the performance. Lastly, the focus is on financial derivatives, which many are Level 3 inputs and where many anecdotal commentaries have been suggested regarding the lack of proper valuations for these instruments. Before gathering these anecdotal commentaries, let us first address a unique situation in the definition of financial derivatives. Under GAAP, there are particular "loops" a financial instrument must go through before being considered a financial derivative under ASC 815.

GAAP/ IFRS definition of derivatives versus financial usage of terminology

It is not surprising that many professionals and finance students are perplexed by the fact that financial instruments, which we define as derivatives in everyday usage, might not be deemed a derivative under GAAP. This is quite important when determining the magnitude of improper valuation techniques used for valuing derivatives, as many of them would not be included under Level 3. Lastly, let us not forget the scope exceptions embedded in Section 815 as well.

The definition of a financial derivative under GAAP is ASC 815-10-15-83 [5]. According to the definition, a derivative product has these three elements: 1) Underlying, notional amount, payment provision, 2) Initial net investment, and 3) Net Settlement [5]. Let us discuss what each component represents. Once again, the following definitions are from the ASC 815-10-15 sections. An Underlying is defined as a variable that, along with either a notional amount or a payment provision, determines the settlement amount of a derivative instrument [5]. Examples of such would include a security price or index, an interest rate or interest rate index, and so forth. With this in mind, a notional amount is a number of currency units, shares, bushels, pounds, or other units specified in the contract, which determines the settlement amount under a derivative [5]. The critical point to understand is that a notional amount is not the same thing as a principal as in bond principal since the notional amount is simply used to determine the payment. The notional amount does not get repaid. In terms of the payment provisions clause per ASC 815, an amount is paid when the underlying behave in a certain fashion. As an example, a contract might specify that a $1 million payment will be made if interest rates decrease by 300 basis points.

With regards to Initial Net Investment, according to ASC 815-10-15, derivatives do not require an initial cash outlay or, if so, might require only a minimal amount that technically covers payment as compensation for time value considerations [5]. You can view this similarly as paying a premium for an option. Unfortunately, the FASB and IASB did not provide any specific tests to determine what constitutes a minimal amount. This factor is critical in determining and eliminating many financial instruments that would constitute derivatives under everyday term usage. More on the particular instruments a bit further down in this section.

The last element constituting a derivative under accounting is the Net Settlement criteria. Again, under the ASC, a derivative must have the feature of a cash settlement, which means that a contract can be settled at its maturity through an exchange of cash instead of through physical delivery of the referenced asset [5]. In particular, Net Settlement can take place based: a) under contract terms, b) via a market mechanism, or c) delivery of the derivative instrument or asset readily convertible to cash. That is one of the reasons why derivatives such as futures, forwards, swaps, and options meet the accounting definition because either: (1) their contract terms call for a net cash settlement or (2) a mechanism exists in the marketplace that makes it possible to enter into closing contracts with a net cash settlement.

While certain financial instruments such as plain vanilla bonds and marketable securities would obviously not meet the definitions of derivatives under accounting and even in ordinary finance vernacular, certain other instruments would be surprising. For example, mortgage-backed securities which most finance professionals would deem a derivative instrument, does not meet the definition under accounting as it fails the initial net investment requirement. To meet the definition under accounting, the initial investment must be nominal, if at all. To purchase mortgage-backed security, one needs to pay the full fair value of the instrument.

Lastly, there will be financial instruments that would normally be considered derivative instruments except for the scope exceptions. These would include loan commitments and interest-only strips. As a result, deciphering the quality of financial reporting in this light

must be considered. The number of reissuance restatements under the derivatives category might be understating the true nature of the problem due to both definitional issues and scope exceptions.

Literature review on Level 3 reporting of derivative products

As mentioned, Level 3 inputs are unobservable inputs used in valuing assets and/ or liabilities. These unobservable inputs are used to determine a fair value to the extent that relevant observable inputs are not available. An entity develops unobservable inputs using their professional judgement while keeping in mind that fair value measurement requires considering market participant assumptions that are reasonably available. As this demonstrates, since we are dealing with minimal transparency of data, it would not be unusual to see flaws in both the reporting and valuing of these financial instruments. Due to this lack of transparency in Level 3 inputs, the SEC, along with FASB, requires certain detailed reporting requirements governing these inputs. The SEC, as the guardians for investor protections, is quite concerned about the quality in reporting governing liquidity and financial risk. For financial instruments disclosures are even more demanding due to their significant impact on financials. For example, under FASB ASU 2018-13 (Topic 820), firms are required to (non-exhaustive list):

- provide relevant information to existing and potential users of the financial statements;
- apply a cost-benefit approach in justifying the costs associated with granular details;
- determine whether financial instruments are affected by the lack of market liquidity;
- factor the liquidity risk into the fair value determination of those financial instruments such as the discount rate in the discounted cash flow approach; and
- ascertain how the firm's credit risk affected the valuation of derivative assets and liabilities.

The accurateness of Level 3 reporting and disclosures should next be considered. In 2008, the SEC issued the "Report and Recommendations Pursuant to Section 133 of the Emergency Economic Stabilization Act of 2008: Study on Mark-To-Market Accounting" [3]. This report was issued via a Congressional mandate due to the financial crisis back in 2007/ 2008, which looked at fair value accounting and whether this accounting regime possibly led to the crisis. There were several pertinent points reached in their conclusions and, as part of their eight recommendations, suggested that fair value be continued but improved via best practices for determining fair value in illiquid or inactive markets. While this was the year 2008, have we improved since then in terms of financial reporting of these Level 3 inputs. Let us examine some commentary. The article by Sherman and Young [6] cites the subjectivity and difficulty in applying fair value accounting and provided an example of where differing values were applied to the same transaction. In another article by Chung, Lee and Mitra [7], among their conclusions about fair value, they suggested "...that Level 3 assets, whose fair values are subjectively determined by management, hurt companies' market values in the form of larger share price discounts. These discounts seem to be driven by investors' skepticism about the reliability of management's estimates. Anecdotal evidence further supports such skepticism." According to Dr. Reid, the "mandatory disclosure requirement of ASC 820-10 does increase financial reporting quality and provides useful information to investors" [4]. This assumes, however, accurate disclosure information.

Another academic paper by Lin, Lin, Fornaro and Huang suggested that Level 3 fair value assets are positively associated with the likelihood of financial statement restatements within two years following reporting these assets... "In a supplemental analysis, we investigate and find evidence suggesting that stronger corporate governance mechanisms somewhat help mitigate the positive association between Level 3 fair value assets and subsequent financial statement restatements [2]. Overall, our results indicate that the use of less reliable fair values, such as Level 3 fair value assets, may result in lower accounting quality." In a paper by Bens, Cheng and Neamtiu, the authors stated that based on their cross-sectional analyses, "reduction in [investor] uncertainty is greater when (1) registrants explicitly acknowledge that they will improve fair value disclosure in response to the SEC comment letter, and (2) the fair value issue plays a more prominent role in the comment letter" [8]. Lastly, authors Magnan, Menini and Parbonetti suggested that in their review of analyst reports on bank holding companies, Level 3 does increase the opacity, which leads to confusion among analysts [9]. "Further analyses reveal that underlying the results for Level 3 FV are deteriorations in analysts' information environment, as reflected in the precision of public and private information" [9].

It is next prudent to consider how the reporting of Level 3 derivative instruments has been over the years via an analysis of financial restatements, From an international perspective, a report titled, "Review of Fair Value Measurement in the IFRS financial statements: July 12, 2017 ESMA32-67-284" by the European Securities and Markets Authority (ESMA) [10] provided an analysis of the application of the fair value measurement and disclosure requirements required by IFRS 13 Fair Value Measurement as applied by European is-

suers. Their study reviewed 78 annual reports from the years between 2013 and 2015. ESMA's expectation was twofold in that they were exploring whether companies emphasized relevant, non-boilerplate information particular to the financial instruments and whether disclosures were reasonably confined to particular sections of the annual report and not scattered throughout. With this stated, some of the findings worth noting are as follows:

- From the firms having Level 3 measurements, which represented over three-quarters of the sample, only 5% offered disclosures on valuation approaches that we deemed boilerplate [10].
- The majority of companies reporting information on Level 3 measurements provided pertinent disclosures on how the entity decides its valuation policies [10].
- Slightly more than half of the companies provided the required narrative description of the sensitivity of fair values to changes in unobservable inputs if a change in those inputs potentially results in significantly different value outcomes. From this group that reported, it was deemed that one-quarter of those narratives were boilerplates [10].

An academic paper, "Fair Value Accounting and Reliability: The Problem with Level 3 Estimates" by Chung, Lee and Mitra [7], examined 431 financial statements from 2008. The authors discussed how stock market participants priced Level 1, 2, and 3 assets. Their analysis strongly suggested that the stock market values each dollar of Level 1, 2, and 3 assets at $0.98, $0.97, and $0.68, respectively [7]. The drop in valuation of Level 3 assets indicated that investors were concerned about the reliability of management's estimates of these fair value instruments.

In another study, "Information Risk and Fair Values: An Examination of Equity Betas and Bid-Ask Spreads," [11] while analyzing financial data from 467 financial institutions, Riedl and Serafeim, examined the effect of Level 3 assets on a company's cost of equity capital. They hypothesized that, given management's discretion to estimate the value of Level 3 assets along with the incentives to overstate earnings, market participants might suspect management of overestimating future cash flows to value those assets. The study found evidence supporting this notion that higher exposure to Level 3 assets will result in a higher cost of equity capital [11]. Lastly, a study by Magnan, Menini and Parbonetti "Fair value accounting: information or confusion for financial markets?" [9] argued that greater dollar amounts of Level 3 assets would also lead to more dispersed analyst forecasts due to confusion.

A panel data analysis of Level 3 restatements regarding financial derivatives

The number of restatements has been significantly increasing every year from 2002 until 2006, averaging a 25.90% increase year over year. The reasons for these increases include the advent of Sarbanes Oxley's Section 404 requirements put into law in July 2002, the involvement of the Public Company Accounting Oversight Board (PCAOB) in advancing quality in financial reporting, and an increase in SEC comment letter and advisory activity (GAO- Restatement Dashboard Full Report, 2006) [12]. The largest number of the total restatements, both reissuance and revisions, of 1869 was recorded in 2006. Starting 2007, the number of total restatements dropped almost every year, with the average year over year decline of 9.27%, to a 19-year low of 484 [12].

Implementing a complex valuation of these accounting instruments requires high levels of accuracy and consistency in reporting, which mandates a strong internal control mechanism. As a result, it can be presumed that these issues are detected and fixed at early stages reducing the possible number of errors in the financial statements and, as a result, a lower number of restatements. As we see from the numbers, the total number of restatements in financial derivatives declined from the highest 70 restatements in 2005 to three restatements in 2019. One assumption is that the low number of restatements in such a complex area is due to additional firm controls. During the year 2019, according to Audit Analytics [13], the top seven issues in restatements were:

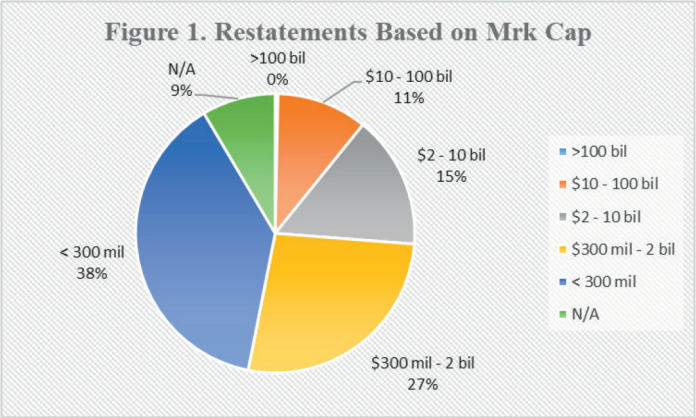
- Revenue Recognition Issues
- Cash Flow Statement (SFAS 95) Classification Errors
- Debt, Quasi-Debt, Warrants and Equity (BCF) Security Issues
- Tax Expense, Benefit, Deferral, and Other (FAS 109) Issues
- Liabilities, Payables, Reserves and Accrual Estimate Failures
- Accounts/Loans Receivable, Investments and Cash Issues
- Expense (Payroll, SGA, Other) Recording Issues

The topic of our paper includes the financial derivatives/hedging (FAS 133, now ASC 815) accounting issues. This type of issues consists of errors or irregularities in approach, theory, or calculation of derivative instruments. For example, these issues may include errors in the valuation of financial instruments, such as hedges on currency swings, interest rate swaps, purchases of foreign goods, and guarantees on future sales. For the last nineteen years, financial derivatives/hedging accounting issues decreased with the compound-

ing annual growth rate of 8.88%, from the highest number of 70 in 2005 to the lowest 3 in 2019. However, does the drastic decrease of the financial derivatives issues in the restatements mean a better understanding of the valuation of Level 3 inputs among the companies?

There were 463 restatements under the financial derivatives/hedging accounting area from 423 distinct registrants. Of these, 347 had negative financial statement impact, and 116 had positive. (NOTE: If we considered the topics of quasi-debt, warrants, which are not deemed derivatives under GAAP, we would have added 3,460 restatements). Most of the issues were from companies with market capitalizations of less than $300 million. Surprisingly, based on the information from Audit Analytics [13], only one restatement was filed by a mega-cap company (those who have a market capitalization greater than $200 billion) which was Bank of America Corp. during the period 2001-2019 timeframe. To the authors of this paper, it was quite interesting noting that only one mage-cap company filed a restatement under the financial derivatives/hedging accounting area during the period 2001-2019.

By filtering the data according to the companies' market capitalization, as stated earlier, we found that most of the restatements are filed by firms with a market capitalization of less than $300 million. Furthermore, firms with unknown market capitalizations filed around 8.5% of restatements containing the financial derivatives/hedging accounting issues (Figure 1).



Using the Audit Analytics database, we also considered the industries with most of the restatements issued. As we expected, most restatements are applied by the firms in the Finance and Insurance (NAICS 52) and Mining (NAICS 21) industries (Table 1).

Table 1

NAICS	Description	# of restatements	distinct firms
72	Accomodation and food services	6	6
56	Administrative and Support and Waste Management and Remediation Services	4	4
71	Arts, entertainment, recreation	2	2
23	Construction	4	4
52	Finance and Insurance	**160**	**142**
62	Healthcare and Social Assistance	4	4
51	Information	22	21
55	Management of Companies and Enterprices	1	1
31	Manufacturing	10	10
32	Manufacturing	30	28
33	Manufacturing	43	42
21	Mining	**79**	**72**
81	Other Services (except Public Administration)	2	2
54	Professional, Scientific, and Technical Services	8	8
53	Real Estate and Rental and Leasing	10	7
44	Retail Trade	3	3
45	Retail Trade	2	2
48	Transportation and Warehousing	23	22
22	Utilities	36	32
42	Wholesale Trade	9	8
	Unassigned	4	2
	Total	**462**	**422**

In terms of the nature of restatements, we found that the most commonly flagged issue by far related to interest rate derivatives and particularly interest rate swaps. Unfortunately, most restatements contain only general phrases, such as "certain derivative class," "interest rate derivative," etc. The particularities governing the need for the revisions were notably absent and therefore prevented the authors to determine the methodological flaws.

Lastly, from the period of our study, after analyzing the Audit companies during the period of restatements, we found that most restatements were made by the firms working with PricewaterhouseCoopers LLP (116 restatements from 104 firms) and KPMG LLP (109 restatements from 104 distinct firms) (Table 2).

Table 2

Auditors at Discloser period	Restatements	Distinct firms
PricewaterhouseCoopers LLP	116	104
KPMG LLP	109	104
Deloitte & Touche LLP	78	76
Ernst & Young LLP	64	60
Arthur Andersen LLP	9	9
Grant Thornton LLP	13	13
BDO Seidman LLP	8	8
Crowe Chizek & Company LLP	3	3

Conclusion

During the period from 2001-2019, there has been a noticeable decrease in the number of restatements overall and particularly in the areas of derivatives and hedging techniques. The authors also noted that the smaller companies (under $300 million market capitalization) had the most restatements in the area under study. As expected, the industries of finance and insurance led the way with most restatements. Further, the lack of granular details in the restatements prohibited further analysis of the methodological flaws in derivatives and hedging. For instance, interest rate swaps were the most cited area of the restatements, yet; we were unable to determine the cause for the restatement, such as faulty valuation techniques, lack of transparency, etc. With the information gathered from this research, the authors will direct their research into interest rate derivatives and attempt to ascertain the flaws noted in this particular arena. Lastly, another area for research governs whether the downtrend in restatements is due to increased accuracy by the firms or lack of enforcement by regulatory agencies.

References

1. Financial Accounting Standards Board (FASB) (2006) Statement of Financial Accounting Standards No. 157. Fair Value Measurement. FASB.

2. Lin Y, Lin S, Fornaro J, Huang HS (2017) Fair Value Measurement and Accounting Restatements. Elsevier.

3. US Securities and Exchange Commission (US SEC) (2008) Report and Recommendations Pursuant to Section 133 of the Emergency Economic Stabilization Act of 2008: Study on Mark-To-Market Accounting. SEC.

4. Reid J (2017) Examining the Effects of Fair Value Measurements on Financial Reporting Quality and the Cost of Equity. Journal of Finance and Accountancy Vol. 22.

5. PWC (2019) Derivatives and Hedging

6. Sherman DH, Young DS (2016) Where Financial Reporting Still Falls Short. Harvard Business Review.

7. Chung SG, Lee C, Mitra S (2016) Fair Value Accounting and Reliability. The Problem with Level 3 Estimates. CPA Journal.

8. Bens D, Cheng M, Neamtiu M (2016) The Impact of SEC Disclosure Monitoring on the Uncertainty of Fair Value Estimates. The Accounting Review.

9. Magnan M, Menini A, Parbonetti A (2014) Fair Value Accounting: Information or Confusion for Financial Markets? Springer Science+Business Media.

10. European Securities and Markets Authority (ESMA) (2017) Report. Review of Fair Value Measurement in the IFRS Financial Statements. ESMA.

11. Riedl E, Serafeim G (2011) Information Risk and Fair Value: An Examination of Equity Betas and Bid-Ask Spreads. Journal of Accounting Research.

12. US Government Accountability Office (US GAO) (2007) Financial Restatements. Update of Public Company Trends, Market Impacts, and Regulatory Enforcement Activities. U.S. General Accountability Office.

13. Whalen D, Coleman D, Tanona D (2020) 2019 Financial Restatements. A Nineteen Year Comparison. Audit Analytics.

Business valuation and fundamental analysis

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Business valuation requires adequate fundamental analysis. Fundamental analysis is often confined to the analysis of the firm's historical or current performance or to the analysis of the business plan (which, however, may have been produced for different purposes and with different strategic and sector analysis support).
The article aimed to illustrate the importance of two models of fundamental analysis (I/O and R/B), focused on the company's sector/strategic group and on the company's resources/skills/business model, respectively. The first model (I/O) takes on greater relevance in sectors at the extreme ends of the attractiveness scale (very attractive or unattractive). In all other sectors, the second model (R/B) is more relevant. The analyses carried out on the basis of the two models allow the valuer to form an opinion that includes information of a fundamental nature that traditional financial models tend to exclude.

1. Which fundamentals?

A business valuation is an opinion, not a fact. It is the result of professional judgement, not of a mathematical formula. Accordingly, a valuation must be transparent and substantiated. Fundamental analysis is the basis for business valuations, as it provides logical and rational support to the assumptions underlying them. A valuation should explain how the markets in which the company operates work, where the growth opportunities lie, how the company can fend off competitors (current and potential), what the main sources of risk are, etc. However, this is not always the case, due to the widespread belief that company performance (return on capital), market positioning (market share) and competitive positioning (competitive advantage) are always aligned. If a company has a high return on invested capital and stable market share, it means that it also enjoys a sustainable competitive advantage. From this standpoint, financial results, market positioning and competitive positioning are only alternative ways of describing the same thing. Consequently, it is sufficient to focus attention on financial results and on the business plan, also because they can be more easily integrated into valuation models than analyses of the competitive environment, the business model, the resources available to the company, etc.

However, value is a function of future performance. Future margins, overheads, capital expenditures will depend on the intensity of competition, the ability of the company to maintain or increase its market share, the obsolescence of sources of competitive advantage etc., i.e. variables that are left out altogether of fundamental analysis based only on historical or current performance. The consequence is that many valuations ignore crucial information of a fundamental nature. Often, the choice of researching fundamentals in financial results alone is due to the desire to make use of information that is more certain than the much more uncertain but economically more meaningful information represented by the evolutionary analysis of the sector and the company. However, a fundamental analysis based solely on (past, current and short-term prospective) accounting data and financial results provides a false idea of reliability, as it is rooted in an incomplete information base.

The limitations of this approach emerged in the wake of the Covid 19 pandemic, when many valuations, instead of looking at the next normal scenario, confined themselves to the duration and intensity of the crisis, on the assumption that in a timeframe varying from company to company and from sector to sector things would return to the old pre-Covid scenario. However, there are many signs of structural changes brought about by the pandemic (in purchasing habits, in supply chain organization, in sensitivity to ESG issues, etc.) that a good valuation should describe and acknowledge. If the narrative of what could change for the company and its sector is missing, it means that the valuation excludes a significant part of fundamental analysis. Damodaran calls this part of fundamental analysis more difficult to translate into numbers and to address in financial models – i.e. the story - and says[1] "*one of the most important lessons I have learned is that a valuation that is not backed up by a story is both soulless and untrustworthy* (...)".

Of course, the story that each valuer can tell about

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[1] Aswath Damodaran, *Narrative and Numbers. The value of stories in business*, Columbia Business School publishing, 2017, p. vii.

the same business varies in part, due to professional judgement, but incorporating in the valuation all those fundamentals - from the competitive landscape to business strategy - that financial models would be inclined to exclude is an important step forward in improving the quality of business valuation.

This article focuses on fundamental analysis other than financial analysis. It does not present new models or new analysis tools, but rather presents the process that should be followed to avoid falling into the trap of always considering historical or current profitability as a good proxy for future profitability.

2. Fundamentals and business plan

The value of a business is a function of the profitability and growth that the business is (or is not) able to achieve over the long term in the competitive environment in which it operates. Fundamental analysis is the logical framework needed to understand the drivers of such growth and profitability. Fundamentals are very often confused with the business plan and any valuation based on the DCF model is defined as "based on fundamentals". However, this is not the case. The fundamentals of a company are the determinants of its prospective earning power, its foreseeable development and its risk profile and may (or may not) be reflected in the plan in relation to the different purposes for which the plan has been drawn up (management incentive, loan application, new share issue, etc.).

Confusing the business plan with the fundamentals of the business will lead to major errors, because:

- plans are always designed to improve results over time, and confusing the fundamentals with the plan leads to an enterprise value that increases with the length of the forecast horizon. Applying the DCF model to a five-year plan yields a higher value than that which would be obtained by basing the valuation on a three-year plan. It is as though the enterprise value were a function of the extension of the plan horizon;
- current results are the result of the company's market positioning, which does not necessarily coincide with its strategic positioning[2]. A company may in fact enjoy a large market share as a result of correct choices made in the past, but lag far behind the competition in terms of its ability to introduce new products, innovate its offering, etc. (= weak strategic positioning). Or, on the contrary, the company may be characterized by a market positioning that is still marginal, but have laid the foundations for a strong strategic positioning capable of achieving significant prospective growth.

Plans should not be confused with fundamentals. Fundamentals are the drivers of expected economic benefits and of the sustainability of current results over time.

The value of any enterprise is based on three main variables:

(i) earning power (and necessary capital base);
(ii) growth prospects (and capital requirements);
(iii) risk.

Fundamentals are nothing more than the determinants of the firm's earning power, growth prospects, risk profiles and capital requirements. Necessarily, fundamentals vary from firm to firm as they depend on the sector, the sources of competitive advantage, the business model, the size of the company, the stage of the life cycle, etc...: in short, they are entity specific.

This means, by way of example only, that two firms - one with a highly concentrated customer base and the other with a more evenly distributed customer base, but equal in all other respects - cannot have the same value. The firm with the more concentrated customer base must be worth less, because it is exposed to greater risks. Again, two firms - one with a pipeline of new products ready to be launched on the market and the other without a pipeline of new products, but equal in all other respects - cannot have the same value. The firm with the pipeline of new products ready to be launched on the market must be more valuable, because it has a better chance of preserving its future earning power.

3. The models

Fundamental analysis does not only concern the company, but also the environment in which it operates. This is due to the fact that company performance is rarely a function of managerial skills alone; more often it is conditioned (and sometimes predominantly so) by the competitive environment. No firm operates in a 'vacuum'.

Business performance depends both on choices under the firm's control (market selection, pricing, investment, execution, etc.) and on factors outside its control (macroeconomic trends, consumer reactions, technological change, etc.). More specifically, the performance of any company is a function of the degree of competition in the sector/market/segment in which it operates and the degree of success (or failure) of its strategy.

[2] In the long term, market positioning (market share) cannot evolve with the strategic positioning of the company (innovation capacity), but in the short term, significant misalignments can occur. Strong market positioning often leads management to err on the side of overconfidence in its ability to maintain its dominant position and to overlook signs of strategic weakening.

The size of the market, the growth rate of demand, profit margins, the type of products/services offered, the distribution channels, the capital needed to carry out the business, the cost structure, etc. all depend on the combined effects of these two factors (competitive environment and strategy).

This is why fundamental analysis concerns two main areas:

(a) the competitive environment;

(b) the competitive advantage (or disadvantage) and the business model of the company.

The most frequent models of analysis are derived from strategic analysis and refer to:

a) the industrial organization model (I/O), which focuses the analysis on the environment in which the company operates and then identifies the main performance fundamentals outside the company;

b) the resource based model (R/B), which focuses on the sources of competitive advantage and the business model and therefore identifies the main performance fundamentals within the company.

The choice of one model or the other depends on the attractiveness of the sector/market/segment in which the company operates. The level of attractiveness defines the degree of relative uniformity of performance of the companies operating in it. However, the relationship is not linear, but takes the shape of an inverted "U".

Referring to a hypothetical scale of attractiveness of sectors, defined, on one end, by extremely attractive sectors (high growth, high entry barriers) and, on the other, by unattractive sectors (declining sectors, high exit barriers), it is intuitive to assume that, in the highly attractive sectors, firms operate with profitability above the cost of capital; in the unattractive sectors, firms with profitability below the cost of capital prevail while, in the intermediate sectors (stable sectors with normal attractiveness), firm performance is much more dispersed (some firms have profitability above the cost of capital, others profitability in line with the cost of capital, and still others profitability below the cost of capital). Thus, the explanation of the performance of firms operating in sectors/markets/segments at both ends of the spectrum (very attractive and unattractive) is mainly external to the firms themselves, that is in the environment in which they operate (favourable and unfavourable, respectively = industry is destiny), while the explanation of the performance of firms operating in intermediate sectors is mainly internal, i.e. their strategy, business model, etc. (industry is not destiny).

The industrial organization model is based on four assumptions:

1) the environment (sector, phase of the economic cycle, etc.) represents the main conditioning factor for firm performance;

2) within each sector, strategic groups can be identified as composed of competing firms with similar strategic resources and strategies;

3) the mobility of resources between firms in the same strategic group means that any distinctive advantage developed by a firm in the group cannot be long-lasting. This fosters the alignment of performance in terms of return on capital (not market share) of firms belonging to the same strategic group;

4) the performance of firms belonging to the same strategic group is to a large extent determined by the attractiveness, or lack thereof, of the sector/segment and the market positioning (market share) of the firm.

The I/O model therefore ties the company's fundamentals to the sector (or more generally to the external environment) and to the company's market positioning (market share) within the strategic group of reference.

On the other hand, the resource-based model is based on four very different assumptions:

1) the resources available to the firm, the capabilities developed for their exploitation and the uniqueness of the key competencies determine the competitive advantage of the firm and thus constitute the main drivers of its performance;

2) only part of the resources at the firm's disposal translates into capabilities and only part of the capabilities translates into key competencies and, hence, into competitive advantage; meanwhile without resources one cannot develop capabilities and without capabilities one cannot develop key competencies;

3) competitive rivalry in a sector/segment is an inverse function of market communality (= frequency of markets/segments in which the same firms compete with each other) and a direct function of the resource similarity of the firms operating in it;

4) the duration of the firm's competitive advantage is an inverse function of its imitability (in terms of time and costs).

Thus, the resource-based model attributes the fundamentals of the firm to the key competencies that it has developed, to competitive rivalry and to the imitability of the sources of competitive advantage. It generally emphasizes the strategic positioning of the firm over its market positioning (market share) in explaining the prospective performance of firms.

Each of the two models (I/O and R/B) provides an initial point of reference for identifying firms in decline. Both the firm operating in an unattractive sector (I/O model) and the firm that - regardless of the sector to which it belongs - lacks key competencies (R/B model) achieve returns below their cost of capital. As is well known, the inability to achieve a return in the medium term that is at least equal to the normal return (cost of capital) leads to progressive decline as the company has difficulty in satisfying all the different

categories of stakeholders (lenders, customers, suppliers, local community, employees, etc.), thereby increasing the costs of failure as stakeholder confidence in the company wanes. A first category of firms in decline is therefore that of firms operating in unattractive sectors or vice versa firms lacking key competencies.

The choice of the analysis model better suited to identify the fundamentals of the specific company to be valued (I/O or R/B) requires a preliminary analysis of the sector/market/segment in which the company operates. In fact:

- the industrial organization model is more appropriate when the firms operating in the sector/market/segment are very similar to one another or the differences among them are not only such as to allow them to achieve significantly different performances, and they are almost equally affected by changes in demand, the bargaining power of customers and suppliers, the threat of substitutes and/or new entrants. These are often markets/sectors that have benefited or undergone value migrations from (or to) upstream or downstream or neighbouring sectors with converging technologies or delivery modes. The industrial organization model is very effective in identifying the fundamentals in all those sectors/segments that are positioned at the two extremes of the attractiveness scale (based on the sector's lifecycle stage and the analysis framework of Porter's five forces). These are either very attractive sectors/segments (developing and/or with: high barriers to entry, suppliers and customers with low bargaining power, no threat of substitutes, low competitive rivalry within the sector) or unattractive sectors/segments (declining and/or with: low barriers to entry, suppliers and customers with high bargaining power, significant threats of substitutes, fierce competitive rivalry within the sector due to high barriers to exit). This is because, normally, within these sectors, firms show returns that are relatively insensitive to the strategy adopted by the firm, since external forces are the main driver of firm performance;
- in sectors that are not at the extremes of the attractiveness scale, the most effective model for identifying fundamentals is the resource-based model, since the ability of the firm to generate returns that are higher, lower or aligned with the cost of capital (= normal return) depends mainly on the business model and the sources of competitive advantage (i.e. the characteristics of the specific firm). The identification of the fundamentals in these cases requires the analysis, on the one hand, of the resources, distinctive capabilities and key competencies that contribute to forming the competitive advantage (or disadvantage) and, on the other hand, of the degree of imitability by competitors of the competitive advantage that defines the competitive landscape - and therefore the sustainability over time of the factors of success (and failure) of the firm. This analysis makes it possible to understand:
  - the sustainability of the competitive advantage held by the firm. In fact, only evidence that competitors' attempts to imitate the competitive advantage accumulated by the firm have ceased or failed can be considered sustainable;
  - the speed with which competitors are able to acquire the skills necessary to duplicate the sources of competitive advantage and therefore how long the competitive advantage can last.

4. The Industrial Organization (I/O) model

The I/O model identifies the external environment as the main driver of the performance of firms operating in the same sector/market/segment. The sector/market/segment in fact defines the barriers to entry, economies of scale, the degree of diversification, product/service differentiation, the degree of concentration (or the tendency to concentrate) and the presence of any market frictions that may hinder the orderly unfolding of competitive forces (imperfect and asymmetric information, resources that are not fungible due to sunk costs, specificity of assets, difficulties in protecting intangible resources with intellectual property rights, etc.).

The importance of the sector in influencing the performance of firms does not only concern the so-called "commodity markets", i.e. sectors with no barriers to entry, where companies have equal access to customers, technology and other cost advantages and are thus characterized by almost equal competitive positioning and where - therefore - any strategy companies adopt can be easily imitated by competitors.

The importance of the sector also concerns areas where companies are seeking differentiation but are unable to achieve returns in excess of the cost of capital. These are sectors where firms have strong brands but are unable to achieve returns in excess of the cost of capital because fixed costs are too high or the market size is shrinking. Differentiation in many sectors cannot generate a competitive advantage because it requires investment in advertising, product development, investment in distribution channels, after-sales services and the volume-price sales mix does not necessarily cover all the costs, and generate a return on the investments, of the firms.

The degree of attractiveness of the sector/market/segment is a function of three elements whose interaction affects - more so for sectors at the extremes of

the attractiveness scale and less so for other sectors - the performance that firms in the sector are able to achieve:

A. the five forces of Porter's model (suppliers, customers, competitive rivalry, substitute products and potential entrants);

B. the stage of the industry's life cycle (growth, expansion, maturity, decline);

C. the strategic group to which the company belongs.

When the analysis of the three factors described shows that the sector/market/segment in which the firm operates is very attractive or, at the other extreme, unattractive, the fundamentals of the firm's profitability, growth and risk are to be sought mainly in the external environment (the dynamics of the sector/segment/market) and in the firm's market positioning, since normally firms operating in sectors at the extremes of the attractiveness scale have returns that are higher than the cost of capital and returns that are lower than the cost of capital, respectively, regardless of the business model adopted.

In particular, if the firm operates in an unattractive market/industry/segment characterized by declining demand, high barriers to exit, low degree of product differentiation, absence of barriers to entry, etc., the causes of the decline are to be sought mainly outside the firm itself, i.e. in the contraction of demand, in the concentration of supply, in the mode of competition among firms. All too often, however, restructuring plans are drawn up that overemphasize the benefits expected from turnaround actions in a static perspective, disregarding both the dynamics of the external environment and the reaction that the restructuring strategy may trigger.

5. The Resource-Based (R/B) model

When the firm is not operating in a sector at the extreme end of the attractiveness scale, the fundamentals are to be sought primarily within the firm itself and not in the external environment. This is due to the fact that in sectors with normal attractiveness, the external environment, while generating threats and opportunities, is not characterized by a clear expansionary or contractionary trend. Industry analysis in these cases is useful to identify the main sources of competitive advantage of the best performing firms in the sector - i.e. proprietary technology, brand, customer captivity, economies of scale, etc. - but not to explain the performance of the specific firm.

In fact, the external environment influences "what the specific firm might do", but it is the internal environment (resources, capabilities, key competencies) that defines "what the firm can do". The resource-based model is predicated on the idea that the firm's performance is primarily attributable to its resources, capabilities and key competencies, which contribute to its competitive advantage.

In particular, resources and capabilities contribute to forming the key competencies (distinctive competencies) on which competitive advantage is based. On the other hand, the risk of losing competitive advantage is a function of:

- the rate of obsolescence of key competencies;
- the availability of substitutes for key competencies;
- the degree to which key competencies can be imitated.

Competitive advantage relates to a firm's ability to generate value (achieving returns in excess of the cost of capital = normal return). The ability to achieve returns in excess of the cost of capital normally means that the firm generates value for the customer and appropriates part of such value. The way in which the firm generates value for the customer and appropriates it defines the firm's business model. In particular, the business model defines how the enterprise makes use of its core competencies to generate value for the customer and for itself.

The ability to generate value in a dynamic environment implies the company's ability to continuously regenerate the key competencies that underpin its competitive advantage. There is no guarantee of permanent success even for dominant firms with a strong competitive advantage. The history of many sectors is littered with cases of dominant firms that have seen their performance deteriorate dramatically because they did not nurture the renewal of their core competencies in time due to an overconfidence that past success was a guarantee of future success.

Like the I/O model, the resource-based model is structured on several analysis profiles:

a) the identification of resources, capabilities and key competencies;

b) the imitability of the competitive advantage;

c) the business model.

Let us examine them separately.

A) Resources, capabilities and key competencies

What a firm can do is primarily a function of the resources at its disposal. These resources are tangible (financial, organizational, physical) and intangible (technology, marketing, relationships, human capital). Resources are not assets: all enterprises have plant, machinery, a logo or a name. In order to be assets, they must be potential sources of opportunities, irrespective of whether the enterprise knows how to exploit these opportunities.

The availability of resources is not in itself a source of competitive advantage, as the firm must have adequate capabilities to exploit the opportunities that a

good use of resources should potentially provide. However, the identification of the resources that the firm controls is a key step in the fundamental analysis as the lack of some key resources is a source of competitive disadvantage.

The identification of the resources available to the firm not only makes it possible to understand what the firm can actually do, but it also makes it possible to understand what resources the firm must have in order to compete in its sector/market/segment. Only few missing resources can be acquired on the market and most of them have to be developed internally; suffice it to think of the development of new customer relationships or the restoration of deteriorated relationships with suppliers, or even the rebuilding of the reputation for quality, durability and reliability of the product/service. The loss of such resources as trust and relationships is the most frequent form of manifestation of failure costs for companies in difficulty. This is why financial restructuring, changes in management and sometimes in ownership can enable the firm to quickly recover the wealth of resources that the costs of failure have helped to squander.

Given the same resources, firms can develop different capabilities in different functional areas. There is no correspondence between resources and capabilities. A company may have an established brand name, but lack effective brand promotion; it may have talent in the technical-productive area, but lack the flexibility required by the market in terms of adapting products to customer needs; etc. If resources identify what the company can actually do (in terms of opportunities), capabilities relate to knowing how to do what the market requires with the available resources. Firms in decline may not lack key resources, but rather the necessary capabilities to exploit the available resources. This is the opposite of what happens to companies with great growth potential, where capabilities usually exceed the availability of resources (e.g. financial resources) and investors (typically private equity funds) leverage the scalability of the company's capabilities through the transfer of financial resources to achieve significant growth. When capabilities are inadequate, companies are unable to make the Highest and Best Use - HBU - of the available resources. This explains why two firms with the same resource pool but very different capabilities may show completely misaligned performance.

Not all the capabilities at the company's disposal are a source of competitive advantage (= they translate into higher-than-normal performance), as many of them are already common in the sector (the sector's best practices are not a source of competitive advantage, they are the so-called ordinary capabilities, i.e. the capabilities needed for the company to maintain its normal performance in the long term), or are easy to imitate, or are easily replaceable with others already available to competitors. Only certain specific (special) capabilities can generate a competitive advantage. Such (special) capabilities are referred to as core competencies. They are skills that are developed within the firm and can rarely be acquired from outside. Key competencies are capabilities that fulfil four requirements (usually referred to by the acronym VRIN, from their initials). In particular key competencies must be:

a) ***V****aluable* = able to generate value for the customer;

b) ***R****are* = not common among competitors;

c) ***I****mperfectly imitable* = difficult to imitate by competitors or imitable at a high cost;

d) ***N****on substitutable* = not substitutable with other, strategically equivalent, capabilities.

Capabilities that do not meet the four requirements (VRIN) are not key competencies and therefore not capable of generating returns in excess of the cost of capital (= normal return). The idea behind the resource-based model is that no competitive advantage can be built by producing undifferentiated goods, using undifferentiated components, undifferentiated processes and just following best practices. Therefore, while any key competency corresponds to a specific capability developed by the firm, not all capabilities developed by the firm are also key competencies, as they may be common to firms operating in the same sector (ordinary capabilities).

B) Imitability of competitive advantage

In a dynamic environment a firm's competitive advantage must be regenerated continuously, because competitors tend to imitate sources of competitive advantage, thus reducing their rarity. One of the main reasons for the decline of businesses is precisely the inability to regenerate sources of competitive advantage over time. The time and cost of imitating sources of competitive advantage contribute to defining the degree of dynamic competition in the sector; the more easily sources of competitive advantage can be imitated, the more dynamic the competitive environment. In this respect, there are three different types of sector:

- Slow cycle markets: these are sectors where firms are protected from imitation of competitive advantage, as competing firms find it difficult to reproduce it or have to bear significant costs, with risks of failure. In these markets, the firm's actions are aimed at protecting, maintaining and extending its competitive advantage;
- Fast cycle markets: these are sectors where the sources of competitive advantage change rapidly and/or are easily imitated. In these markets, firms must continually regenerate the sources of compe-

titive advantage and the speed with which they manage to replace them is an important factor in the firm's performance over time. Time is of strategic importance: in order to remain successful, firms must renew sources of competitive advantage before they are imitated by competitors;
- Standard cycle markets: these are sectors where the sources of competitive advantage are partially imitable and imitation is moderately expensive. In these markets, firms need to upgrade the sources of competitive advantage, through incremental rather than radical innovation. In the absence of upgrading sources of competitive advantage, the firm is bound to suffer performance erosion.

The identification of the type of market in which the firm operates provides insight into the risk profiles of the business. The greater the imitability of the sources of competitive advantage, the greater the importance of the company's ability to renew key competencies over time (so-called dynamic capabilities).

C) The business model

The term business model is much misused but not clearly defined. Often the term is used in lieu of the mere description of the activities carried out by the firm. In technical language, however, business model has a precise meaning: it represents the way in which a specific company generates value for the customer and appropriates part of that value. The business model defines the so-called "value creation, delivery and appropriation mechanism".

The business model is not directly observable and therefore needs to be recreated through the analysis of five different and complementary profiles that allow us to answer three key questions:
- Why is the business model able to create value?
- What enables value creation?
- How is value created?

Let us consider them separately.

Why is the business model able to create value?

- Logic: any business model must be capable of being depicted through its operating logic, that is, how value is generated for the customer and how the firm appropriates part of that value. Typically, the operating logic concerns the link between the creation of value for the customer and the appropriation of value for the firm. In particular, it is a question of identifying the link between the variables that define the offering (the value proposition to the customer) and the returns for the firm. The logic on which a business model is based may be obsolete in the face of changes in lifestyles, consumption models, relations between companies and technology. Obsolescence manifests itself in a loss of value for customers and/or in the inability of the company to appropriate that value.
- Revenue model: any business model is based on a revenue model that defines the archetype of the model itself. It may be appropriate to provide some examples of revenue models. A typical revenue model is represented by the "razor and blade" model, whereby the sale of a razor at a price lower than its cost promotes its diffusion, which then feeds the demand for consumables (razorblades). Another typical revenue model, called 'freemium', consists of offering some basic services for free (to educate the customer in the use of the service) and simultaneously offering high value-added services for a fee, which, without customer education, would not otherwise be sold. Another model, called "no frills offering", is based on the breakdown of a complex service/product into separately priced elementary components starting from an essential basic configuration (no frills), so as to make it possible to offer such basic configuration at a significantly lower price (low-cost) than the product offered in its standard configuration by competitors. The types of revenue models are so numerous that the term revenue-model zoo has been coined to refer to all varieties of existing models.

What enables value creation?

- Key resources: each business model makes use of specific resources that define its constituent elements. For example, certain business models are capital intensive (i.e. they make use of substantial tangible resources), while others are based on minimizing the amount of invested capital. One example is UBER or FLIXBUS, which are companies that provide transport services without owning the means of transport (which remain the property of the drivers) and use the IT platform and the brand as their main resources to generate customer captivity. This is customer inertia fostered by habit (the UBER customer tends to repeat the purchase on the platform), high switching costs (e.g. related to UBER's once-a-month service billing system) or costs of searching for alternative services (in local markets where UBER's customer would not know where to turn);
- Alignment: value creation requires that the individual elements of the business model be combined in coherent ways that take advantage of their complementarities, interrelationships, and alignment to common goals defined by the underlying strategy of the business model. It would not be possible to adopt a business model like UBER's without a system of rating of the drivers by the customers and/or a system of choice of the car class

of reference (otherwise the drivers would have the incentive to minimize the investment in the car with a consequent reduction of the quality of the service for the customer).

How is value created?

- Activities: the operation of the business model concerns the set of activities put in place to implement a strategy. Often, the business model involves activities that go beyond the boundaries of the firm, permeating upstream and downstream markets.

The analysis of the described profiles should make it possible to identify the firm's business model and, through comparison with the business models of competitors, to understand the reasons for the firm's success/failure. The comparison makes it possible to understand whether the company's business model is obsolete compared to the competition's and the possible bottlenecks that prevent it from being updated (e.g. the absence of adequate skills or resources, the need to divest relevant assets, retraining and skill upgrading, etc.).

6. Conclusions

Business valuation requires adequate fundamental analysis. Fundamental analysis is often confined to the analysis of the firm's historical or current performance or to the analysis of the business plan (which, however, may have been produced for different purposes and with different strategic and sector analysis support).

The article aimed to illustrate the importance of two models of fundamental analysis (I/O and R/B), focused on the company's sector/strategic group and on the company's resources/skills/business model, respectively. The first model (I/O) takes on greater relevance in sectors at the extreme ends of the attractiveness scale (very attractive or unattractive). In all other sectors, the second model (R/B) is more relevant. The analyses carried out on the basis of the two models allow the valuer to form an opinion that includes information of a fundamental nature that traditional financial models tend to exclude.

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