

# PROBLEMS WITH USING EBITDA-BASED VALUATIONS

## *in capital-intensive industries*

WAYNE LONERGAN and HUNG CHU, Directors, Lonergan Edwards & Associates Limited

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*In view of the significant commercial, tax and regulatory implications of the valuation outcome, this paper alerts valuers and market participants to the inherent dangers in the uncritical use of the EBITDA multiple-based method in valuing capital-intensive businesses. We show that equity valuations of established capital-intensive firms by EBITDA multiples are more susceptible to distortions than those based on NPAT multiples. These distortions arise from the inherent tendency of the former to overlook idiosyncratic, value relevant, differences below the EBITDA line between the subject company and the 'comparables' from which multiples are derived.*

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In practice, the theoretically correct and widely used method of equity valuation is the discounted cash flow (DCF) method whereby future cash flows that the asset is expected to generate are discounted to a present value using an appropriate risk-adjusted discount rate. However, when valuing established capital-intensive industrial companies which exhibit an established and relatively predictable earnings stream, it is common practice to use the capitalisation of future maintainable earnings method. This surrogate method of valuation for the DCF method is based on earnings multiples from 'comparable' companies. Alternative measures of earnings include net profit after tax (NPAT), earnings before interest and tax (EBIT) and earnings before interest, tax and depreciation (EBITDA).<sup>1</sup>

The key valuation trap in applying the earnings multiple method lies in treating common earnings measures of the 'comparable' companies and that of the subject company as homogeneous when they are not, thus ignoring value relevant idiosyncratic differences.

In this paper, we show that EBITDA capitalisation, (based on a measure of earnings higher up in the profit and loss account), is more likely to result in equity valuation distortions than NPAT capitalisation. This is principally because idiosyncratic value relevant differences between the subject company and the so-called 'comparable' are more likely to be overlooked by the EBITDA multiple-based method than the NPAT multiple-based method which is closer to a pure DCF approach to equity valuations. This undesirable tendency is further entrenched by the difficulty in accessing information on some of these value relevant differences.

Our paper contributes to the extant valuation literature in the following ways. First, it identifies and analyses the inherent conceptual shortcomings of the EBITDA multiple-based method compared to the NPAT multiple method in equity valuations. Second, it highlights the practical circumstances in which equity valuations in capital-intensive industries are likely to be distorted by the use of the EBITDA multiple-based method compared to a DCF or NPAT multiple approach. These are shown in Table 1 and explained in detail in the section on Traps in EBITDA-based valuations.

**TABLE 1: Why DCF valuations are more reliable**

Issue taken account of	DCF Valuation	EBITDA valuation
Asset age differences	x	✓
Method of fixed asset financing differences	x	✓
Owned asset/equity in leased asset differences	x	✓
Differences in depreciation of owned fixed assets (critical) and their replacement cost	x	✓
Method of working capital funding differences	x	✓
Deferred tax assets/liabilities differences	x	✓
Differentiating capital reimbursements from profits	x	✓
Growth differences	x	✓

### Capitalisation of NPAT versus capitalisation of EBITDA

The capitalisation of future maintainable NPAT method, commonly known as the capitalisation of future maintainable earnings method (CFME), is based on the assumption that future maintainable NPAT is a practical surrogate for cash flows to equity holders.<sup>2</sup> It is a widely used valuation method for established industrial companies.

For these types of businesses, where annual changes in working capital requirements are relatively minor and annual depreciation charges closely reflect replacement capex, NPAT closely reflects free cash flows to equity (i.e. the cash flows after allowing for the necessary reinvestments in the business to maintain its profit generating capacity as a going concern).

The link between DCF and multiples-valuation techniques can be recognised by noting that many professional investors, institutions and acquirers use DCF valuations to perform their equity valuation assessments and thus influence market prices. In these cases, the Price Earnings Ratio (PER) of the 'comparables' reflects market values of equity determined by the theoretically correct DCF method and the NPAT of comparables. In contrast with EBITDA multiples discussed below, both the 'P' component and the 'E' component of the PER ratio reflect an allowance for the reinvestments in maintaining the going concern profit generating capacity of the business.<sup>3</sup>

The use of PER requires the subtraction of value relevant items below the EBITDA line (i.e. depreciation charges, interest expenses and tax). It is this subtraction that brings to the fore the important value relevant differences between entities and triggers the need to allow for these differences in making informed judgements as to the appropriate PER to apply. Alternatively, it is necessary to revert back to the DCF method to explicitly allow for valuation issues that are unable to be transparently and sufficiently dealt with through assessed PER (e.g. fixed asset age difference and resultant timing differences of replacement capex).

In contrast, the use of EBITDA multiples is devoid of this subtraction and the critical review of the subtracted items associated with it. It therefore glosses over what underpins the EBITDA of an individual entity and the quality of its EBITDA relative to the quality of the EBITDA of a 'comparable' entity. For example, an entity with older assets may have the same EBITDA as the EBITDA of an entity with newer assets, but the quality of the EBITDA of the former is lower than the quality of the EBITDA of the latter due to the earlier timing of the asset replacement and the value decrement associated with it.

As EBITDA-based equity valuations only subtract interest-bearing debt from the capitalised EBITDA value to derive the value of the subject equity, this conceals the need to collect and analyse information about, and to allow for, the items below the EBITDA line. The lack of such information and the resulting unidentified and unsupported comparability of the so-called 'comparables' highlights the extreme caution that needs to be exercised in interpreting and using EBITDA multiples.

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Due to the inherent reliance on or 'anchoring' at the EBITDA line, which is higher up the profit and loss account, the use of EBITDA multiples has a natural but dangerous tendency to treat the EBITDA of different entities as homogeneous. It also ignores the inter-entity differences in depreciation charges which, putting aside for the moment idiosyncratic accounting convention, reflect, in economic substance, the periodic costs of maintaining the cash flow generating capacity of the business as a going concern. In addition, in contrast with the 'E' component of the PER ratio and the EBIT multiple, the 'E' component of the EBITDA multiple does not reflect an allowance for such periodic costs, and is therefore inconsistent with its 'P' component.

In this regard, we note that our view on the traps in the use of EBITDA multiples resonates with the following statement by Warren Buffet:

Every dime of depreciation expense we report (at Berkshire Hathaway) is a real cost. And that's true at almost all other companies as well. When Wall Streeters tout EBITDA as a valuation guide, button your wallet.

### **Traps in EBITDA-based valuations**

The use of EBITDA multiples for equity valuation conventionally involves capitalising future maintainable EBITDA at an EBITDA multiple to obtain Enterprise Value from which interest-bearing debt and finance lease obligations are subtracted to arrive at equity value.

Traps in EBITDA-based valuations stem directly from the tendency to treat the EBITDA of different entities as homogenous and the inherent failure of EBITDA to allow for the periodic costs of maintaining the cash flow generating capacity of the subject business as a going concern. These traps are particularly present in cases where the subject entity and the 'comparables' have differences in:

- > fixed asset age
- > fixed asset financing method
- > proportion of owned fixed assets
- > proportion of equity in leased fixed assets
- > deferred tax assets and liabilities
- > proportion of equity funded working capital
- > growth rates.

They are exacerbated by the fact that reliable information about some of these value relevant issues in the so-called 'comparable companies' may not be known.

### **Differences in fixed asset age**

Under the EBITDA multiple-based method, depreciation charges on finance leases and owned assets are recognised after the EBITDA line. Thus, to the extent that the depreciation charges of the subject entity and the 'comparables' convey relevant information about the fixed asset age of the respective entities, the EBITDA being capitalised inherently overlooks age differences, which is one of the critical value drivers of capital-intensive businesses. This valuation trap is best demonstrated by an exaggerated example.

Assume Company A has an average fixed asset age of one year, and an otherwise identical Company B has an average fixed asset age of nine years. Both own all their fixed assets which have a maximum economic life of 10 years. The fixed assets have the same acquisition costs which are depreciated on a straight-line basis. Accordingly, the EBITDA of the two companies are apparently similar and a mechanistic application of the multiples approach would produce a similar Enterprise Value for these two companies.

It is a matter of common sense that a business with newer fixed assets will be more valuable than one with older fixed assets (other things being equal). Similarly, it is clearly wrong to apply an EBITDA multiple from one company with newer fixed assets to a company with older fixed assets, or vice versa.<sup>4</sup> This is because by doing so, the value of the company with the older fixed assets will be overstated (or the company with the newer fixed assets understated).

#### Differences in fixed asset financing method

To demonstrate further why the EBITDA multiple-based method can produce unreliable valuation outcomes, consider three identical transport companies whose only difference is that Company A owns its vehicle fleet, Company B finance leases its vehicle fleet, and Company C finances its vehicle fleet with operating leases. Details are shown in Table 2.

**TABLE 2: Examples of how capitalising EBITDA distorts equity values**

	Company A \$	Company B \$	Company C \$
Revenue	100	100	100
Less expenses:			
Fuel and wages	(30)	(30)	(30)
Service and maintenance costs	(5)	(5)	
Operating lease costs <sup>(1)</sup>	-	-	(45) <sup>(2)</sup>
EBITDA	65	65	25
Depreciation	(30)	(30)	-
EBIT	35	35	25
Less interest	-	(10)	-
PBT <sup>(3)</sup>	35	25	25
Tax	(11)	(8)	(8)
NPAT	24	17	17

Note:

1. These costs are not disclosed in many financial reports as they are in this simplified example.
2. The finance lease costs for Company B are made up of depreciation (\$30) and interest (\$10). Given that service and maintenance costs are generally covered under operating leases, but not under finance leases, the operating lease costs for Company C is the finance lease costs for B plus service and maintenance costs.
3. Profit before tax.

The mechanistic application of the EBITDA multiple-based method tends to apply the same EBITDA multiple to the EBITDA of these companies and then, where applicable, deduct interest-bearing debt and finance lease liabilities from the capitalised EBITDA in arriving at the assessed value of equity. Table 3 shows the consequences.

**TABLE 3: Calculation of equity value based on EBITDA**

	Company A \$	Company B \$	Company C \$
Enterprise value — EBITDA times (say) 5	325	325	125
Less finance lease debt	-	(150) <sup>(1)</sup>	-
Equity value	325	175	125

(1) \$10 interest at 6.7% interest implies a loan value of \$150.

The following observations can be made in relation to the preceding tables:

- > capitalising the EBITDA of Company A would overstate the cash flows available to equity owners and hence equity value because it fails to recognise that the depreciation cost of owned assets normally has to be reinvested in acquiring a replacement vehicle fleet and is not available for distribution to equity owners.<sup>5</sup> It is clearly incorrect to capitalise the value of EBITDA as if all this cash flow went to equity (even though the company has no debt)
- > the Enterprise Value of Company B and Company C (regardless of whether vehicles are finance leased or operating leased) should be the same. Thus, the equity values (obtained by deducting finance or operating lease costs) should also be the same. However, applying the same EBITDA multiple of Company B to the EBITDA of Company C (which is after operating lease payments) is inherently flawed because the EBITDA of Company C is much lower. Yet the reality is that the only substantive difference between the two companies is the form of lease finance adopted.

#### **Differences in the proportion of owned fixed assets**

For regulated infrastructure type assets the allowable regulatory tariff includes a return of capital on assets employed to be passed on to users. In some other industries, e.g. the bus industry, the government effectively funds the capital costs of fixed assets by reimbursing fixed asset costs by an annual payment based on back-to-back (theoretical) finance lease costs. The end result is that these allowable tariffs or reimbursements cover finance and interest costs as if all fixed assets were leased. However, some industry participants own a significant proportion of fixed assets and this is a source of distortions when the EBITDA multiple-based method is applied.

For example, distortions arise when the EBITDA multiple of a Company A whose fixed assets are entirely funded finance leases and debt is inadvertently applied to the EBITDA of a Company B which owns a significant proportion of fixed assets. In this case, deducting only the outstanding principal on finance leases from the capitalised value of EBITDA of the Company B overstates equity value because it fails to recognise the cost of depreciation and replacement of owned assets. Deducting both the outstanding principal on finance leases and other interest-bearing debt from the capitalised value of EBITDA of the Company B in this case still does not overcome this fundamental valuation deficiency and still overstates equity value because doing so still ignores the portion of owned asset replacement cost funded by equity.

#### **Differences in the proportion of equity in leased assets**

Where there is a material difference in the respective equity in leased assets of the subject company and the so-called 'comparable company', the same valuation distortion as for owned assets arises.

#### **Differences in the proportion of equity funded working capital**

The cash flow generating capability of a business depends not only on the reinvestment in fixed assets but also reinvestments in net working capital. Under the EBITDA multiple-based method, the deduction made from Enterprise Value to calculate equity value is limited to interest-bearing debt and finance lease outstanding principal. Such a deduction makes no allowance for differences between the subject company and the 'comparable' company in terms of the extent to which net working capital assets are funded by equity capital. In simple terms, this potential distortion is similar to that arising from differences in the proportion of owned fixed assets discussed earlier.

#### **Differences in deferred tax liability**

Inherently, the EBITDA multiple-based method does not allow for different values of deferred tax liabilities or deferred tax assets. This is an issue particularly in industries where the allowable tax depreciation period for assets is materially shorter than their actual economic life.

This is also likely to be an issue when the so-called 'comparable' transaction is a sale of a business and the subject valuation is the value of shareholder equity in a company (or vice versa). This is because in the case of a sale of a business, the tax consequences to the vendor are generally not known and/or are subject to other idiosyncratic tax factors.<sup>6</sup>

## Growth differences

EBITDA-based equity valuations also generally fail to allow for the interrelationship between different growth prospects and asset replacement needs. A higher growth rate requires either earlier asset replacement from greater use and/or the need to finance asset base expansion, thereby bringing forward significant replacement capex and reducing the net present value of the net cash flows from the business (other things being equal). Capitalising EBITDA of companies with different growth prospects at the same multiple ignores the important cash flow consequences of different growth relativities.<sup>7</sup>

## Conclusion

The use of EBITDA multiples may not cause material valuation distortions in non-capital-intensive industries, or where all the facts about the comparables are known or reasonably allowed for, or if the valuation result is cross-checked to other methods. However, its use fails to allow for many value relevant differences in capital-intensive industries. It can also incorrectly treat pass-through capital cost reimbursement for periodic depreciation charges as part of free cash flows to equity. This method of valuation should not be used in isolation unless all material relevant facts about the entity being valued and the 'comparable' companies are known or reasonably allowed for. In many cases, they are not.

Unless the subject company being valued and the comparable company are (virtually) identical in all material respects, an EBITDA-based valuation may hide many significant value differences in capital-intensive industries.

It naturally follows that as:

- > homogeneity is highly unlikely in a capital-intensive industry,
- > all the facts about so-called 'comparable' transactions are generally not known, and
- > even less is likely to be known about business sales.

EBITDA multiples should not be applied in capital-intensive industries without recognising and allowing for the inherent shortcomings.

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## Notes

1. Historically, EBITDA multiples were used to eliminate valuation distortions arising from the amortisation of goodwill and the widespread practice of minimising goodwill recognition for accounting purposes. As goodwill is no longer amortised, other than in impairment situations, the historical rationale for its use is no longer relevant.
2. Obviously, this is not always so.
3. For established industrial businesses where depreciation charges closely reflect replacement capex, the EBIT multiple (if properly calculated) also reflects such an allowance.
4. Some readers may question how a PER multiple-based valuation better deals with this. The short answer is 'better, but not perfectly'. Essentially this occurs because NPAT is an 'all in' measurement of profit.
5. The same applies to finance lease assets but this is allowed for by deducting finance lease debt from Enterprise Value when valuing equity.
6. Deferred tax assets and liabilities are disclosed in the accounts albeit not necessarily at market value.
7. A discussion of price earnings growth ratios is outside the scope of this paper.