LEVERAGING VALUE WITH INTANGIBLES: MORE GUARANTEES WITH LESS COLLATERAL?

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Abstract

This paper shows how intangibles can create scalable value, levered by debt and serviced by intangible-driven incremental EBITDA and cash flows. Intangibles intrinsically incorporate information asymmetries and may so discourage debt, but are also a vital component of cash generating value, so representing a key factor for debt servicing, with paradoxical effects (more guarantees with less collateral?). Operating leverage is enhanced by scalability, an intrinsic characteristic of many intangibles, with a positive impact on cash generation and consequent debt servicing. Ability to improve cash flows emerges as a key feature of value enhancing intangibles, bypassing their lack of collateral value.

Keywords: Intangible Valuation; EBITDA; Cash Flows, Information Asymmetries; Operating Leverage; Scalability; Debt Covenants

JEL codes: O30, M41, G31, G17

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1 Introduction

Definition (Mehta & Madhani, 2008), accounting treatment and a consequent valuation of intangible capital (IC) are a prerequisite for financial performance appraisal and consequent bankability, combining economic margins, such as EBITDA, with debt-servicing cash flows.

IAS 38 (Para. 12.) defines an intangible asset as "an identifiable non-monetary asset without physical substance". Whatever is not identifiable is allocated in (residual) goodwill, an Arabian phoenix for accountants.

"The academic and professional interest in IC is underpinned by the idea that it can be considered one of the main levers to create value" (Giuliani, 2013) and, according to Michael Porter's fundamental insights, value creation derives from lasting competitive advantage over rival entities, embedded in continuously innovating business models, to be properly designed and managed. Competitive edge is increasingly driven by the catalyst presence of intangibles, which represent a pivotal breakthrough, and it occurs when an organization (painfully) develops core competencies and skills that allow it to outperform its competitors, especially for what concerns customized differentiation.

Intangibles constitute an ongoing challenge for accountants (Giuliani & Marasca, 2011; Roslender & Fincham, 2001) and their recording is a constant dispute, with problematic consequences even on market and performance valuation, exemplified by the increasing gap - softened during recessions – between market and book values, mostly attributable to relevant but not (adequately) accounted for intangibles. International homogeneous accounting treatment for intangibles is still a daunting target (Córcoles, 2010).

Intangible value is hidden in the balance sheet by inadequate accounting, but not in the profit & loss account or in the cash flow statement, where IC incremental contribution to profit is detectable.

This paper starts with a comprehensive intangible valuation approach, with a consequent accounting analysis of operating leverage and scalability, linked to financial leverage and market value assessment by interacting parameters, consistent with a Modigliani & Miller optimal capital structure scenario. Intangibles, often underrepresented in the balance sheet, typically constitute a significant incremental EBITDA driver, which expresses the dominant income-driven cash flow source. Intangibles, which are the invisible "glue" behind going concern and value creation, not only enhance strategic differential value, but are also likelier to make results more sustainable in the future, so easing proper debt service.

DCF or EBITDA calculus is currently used even for the market valuation of intangibles; even if this fact is well known by academics and practitioners, some further considerations, based on intangible driven cash generation, may add originality to the discussion of IC valuation and debt servicing. Asset-less incremental EBITDA, driven by intangibles, reinforces debt service capacity, through "economic" liquidity, originated in the income statement.

The paradoxical relationship between intangibles and debt (discouraged by lack of intangible collateral

value but enhanced by its cash flow contribution to debt servicing) is critically examined, considering the impact of information asymmetries, traditionally embedded in intangibles, on debt rationing.

Innovative findings show that deeply rooted asset backed lending attitudes, deriving from an ancestral agricultural background where land and real estate incarnate value, are increasingly overcome by cash flow based lending, driven by inventive business models and their income generating factors, more and more guided by intangible components and consistent with the knowledge economy framework.

Empirical evidence from an Italian sample of different industries shows proportionality between intensity of investments in intangibles and value.

Some practical tips, in order to soften outstanding issues are lastly enumerated, together with hints for future research avenues.

2 A comprehensive valuation approach

Intangibles may be valued with many complementary methods (cost-based; income-based or market-based), whose practical implications go well beyond plain appraisals, concerning also proper accounting or ability to promptly serve debt.

Issues relating to the valuation of intangibles are surfacing with unprecedented regularity and posit an intriguing challenge for the accounting fraternity that is entrenched in the traditional ascendancy of "reliability" over "relevance" (Singh, 2013).

Intangible assets, such as patents or trademarks (Salinas & Ambler, 2009), are particularly difficult to evaluate (Oestreicher, 2011; Moro Visconti, 2012), due to their intrinsic "immaterial" nature and many different - complementary – quantitative and qualitative evaluation methods (Lagrost *et al.*, 2010; Andriessen, 2004) are traditionally used within the business community; valuation issues are even more complicated for non tradable or not deposited non-routine intangibles, such as know-how (Moro Visconti, 2013), trade-secrets and unpatented R&D (Ballester, Garcia-Ayuso & Livnat, 2003), goodwill, etc., characterized by limited if any marketability, higher and pervasive information asymmetries and less defined legal boundaries, especially within increasingly specific businesses.

Intangible assets may anyway hardly be estimated on a single basis, being mostly transacted within intangible package deals. These difficulties in market evaluation are even more evident considering that, from an accounting perspective, according to IAS 38 there is no active market for intangibles, typically undetected, and it is consequently difficult to assess their fair value.

The main financial / market methods used for intangibles' fair pricing, with an appropriate rating and ranking, selectively applicable to intangible assets, are the following:

1. *Cost-based methods*, with an estimate of the "what-if" costs to reproduce or replace intangibles from scratch; this method ignores both maintenance and the opportunity cost of time (reproducing an intangible may take years, whereas its missed use is due to generate a lack of income) and is not very useful for income generating assets, such as performing patents or trademarks; cost to cost comparisons are difficult to imagine, especially if they are to be protracted over years; even if intangibles strongly depend on long cumulated costs, their perspective value may hardly be inferred from past expenses and is also highly volatile and instable and cost differs from the value. To the extent that costs cannot typically be capitalized, their accounting track record may (partially) be detected from past income statement recordings.

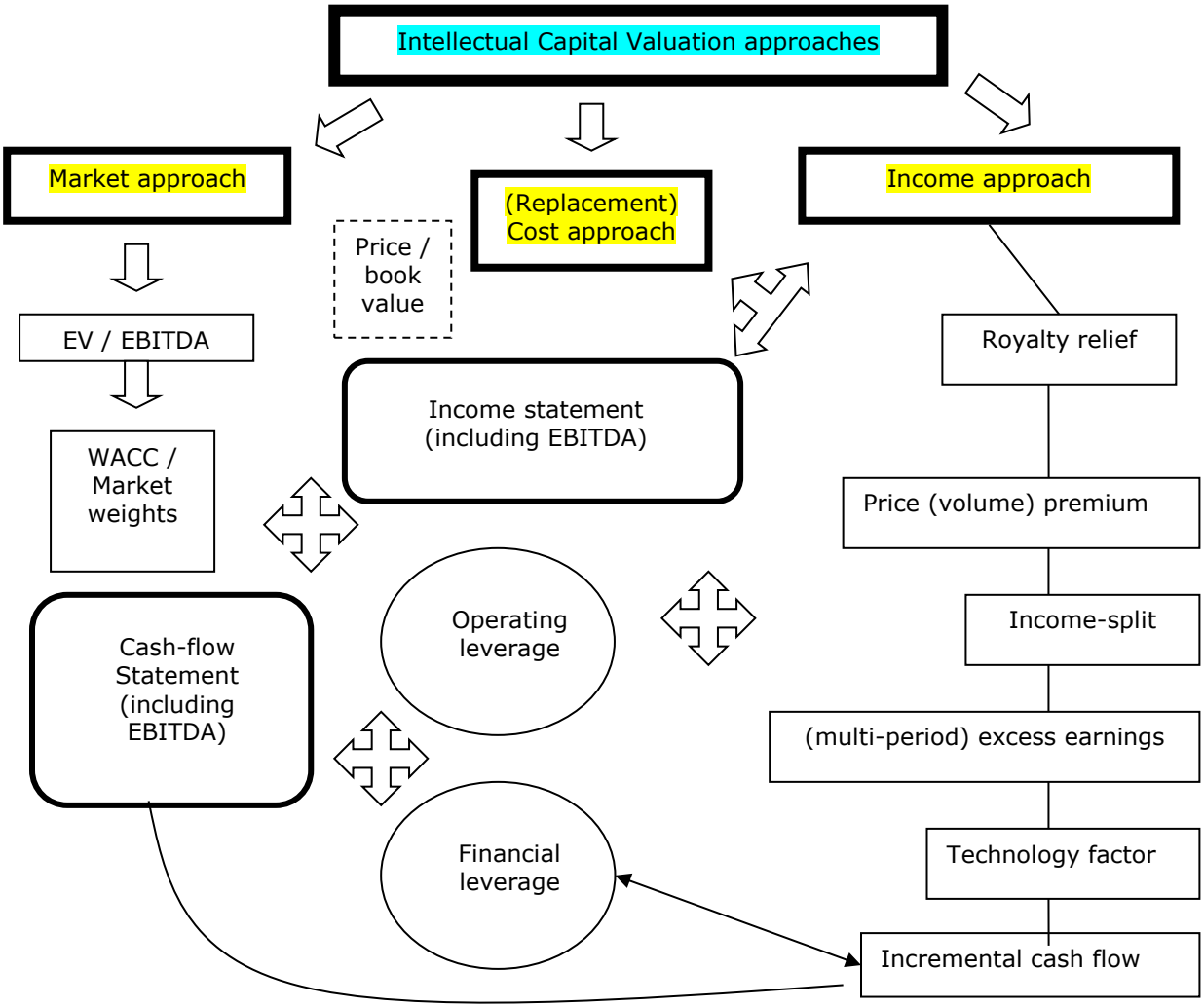
2. *Income methods*, based on the estimate of past and future economic benefits, assessing the ability of the intangible to produce licensing income (royalties, which etymologically derive from "sovereign rents") or sale of the intangible; they may include:
   - capitalization of historic profits deriving from the exploitation of the intangible;
   - Discounted Cash Flow (DCF), to estimate Net Present Value (NPV), duly incorporating risk adder factors in the discount rate, such as technology venture capital risk;
   - gross profit differential methods; they look at the difference in sales price between an "intangible backed" product (branded, patented, with embedded know-how …) versus a generic one; the profit differential is then forecast and discounted;
   - excess or premium profit methods; similar to the gross profit, it is determined by capitalising the additional profits generated by the business over and above those generated by similar businesses, which do not have access to the intangible asset. Excess profits can be calculated by reference to a margin differential;
   - relief from royalty method: based on the assumption that the owner of the intangible is "relieved" from paying a royalty to obtain its use, the process considers the hypothetic "what if" royalty that a potential user would be willing to pay, and discounts its projection; a comparable market range of "reasonable" royalties may derive from careful arm's length benchmarking.

3. *Market-based methods*, evaluating an intangible asset by comparing it with sales of comparable / similar assets (considering their nature; using functional analysis …). Information asymmetries often conceal the real (mostly secret) nature of the allegedly comparable transaction. A market based variety may refer to the evaluation of the incremental equity, with indicators of the business surplus, given for example by the Tobin Q, the ratio between the market value and replacement value of the same asset; a market value exceeding the

replacement value may be a numerical consequence of valuable intangibles.

While income and market based methods may theoretically seem based on accrual or, respectively, cash flow accounting, in reality they tend to share common parameters, softening the Manichean difference between these two apparently antithetical accounting procedures. A synthesis of economic (based on accrual accounting of revenues and costs) and financial flows, is represented by their (only) common parameter – EBITDA - as it is shown in figure 1.

Figure 1. IC Valuation methodologies



Market valuations may use as preferential methods either DCF or directly an EBITDA multiplier, inspired by (intrinsically uneasy) IC comparisons. DCF theoretically stands out as the optimal method, being inspired by the golden rule according to which "cash is king".

DCF is ubiquitous in financial valuation and constitutes the cornerstone of contemporary valuation theory (Singh, 2013). The robustness of the model as well as its compatibility with the conventional two dimensional risk-return structure of investment appraisal makes it suited to a multitude of asset/liability valuations. Accounting standards across the globe recognize the efficacy of this model and advocate its use, wherever practicable. FAS 141 and 142 of the United States and IAS 39 that relate to the accounting of intangible assets, also recommend the use of DCF methodology for imputing a value to such assets.

Market evaluations also frequently use a standardized EBITDA multiplied over time (from 2/3 up to 15 or more times/years, in exceptional cases such as patented killer application or "superstar" brands) and this (apparently) simple multiplication brings to an Enterprise Value (EV), attributable to debt-holders and, residually, to equity-holders. This approach is consistent with the accounting nature of EBITDA, which is calculated before debt servicing.

EV / EBITDA multipliers may be connected to price / book value or Tobin q parameters, which reflect the differential value of intangibles under a hypothetical cost reproduction hypothesis, so representing a precious bridge

between otherwise disconnected market and cost appraisal methods.

As a rough calculation, the EV multiple serves as a proxy for how long it would take for a complete acquisition of the entire company (including its debt) to earn enough to pay off its costs (assuming no change in EBITDA and a constant added value contribution from the IC portfolio).Temporal mismatches between the numerator and the denominator may bias the ratio and should accordingly be minimized.

Equity and debt value may be jointly inferred from an EBITDA multiplier, which estimates EV, and, after deduction of market value of debt, residual market value of equity. Whenever residual market value of equity exceeds its book value, BV, (price > book value; P/BV> 1), an implicit safety net for principal debt repayment emerges. Being EV a surrogate for market capitalization (price), its relationship with market-to-book and Tobin q, driven by the presence of intangibles (Valladares Soler & Cuello de Oro, 2007; Chen, Cheng & Hwang, 2005) seems even more evident.

The stream of (hopefully) growing and not ephemeral Operating Cash Flows - CFo - (marginally attributable to the intangible strategic contribution to the overall value) incorporates growth factors (Tan *et al.*, 2007), whereas the weighted average cost of capital (WACC) discounting denominator embodies market risk elements, as recognised by debt and equity underwriters. Moreover, cash flows are a cornerstone of debt service, as it will be shown later. Qualitative issues, such as consistency, durability, depth of coverage, etc., concerning IC, may strategically impact on future EBITDA, cash flows and consequent value. WACC may also be affected by the asset substitution problem and inherent wealth transfer from debt- to equity- holders (or vice-versa), as it will be shown in the next paragraphs.

What matters, should the valuation consider only IC marginal contribution to the overall company's value, is just described by differential/incremental CFo or EBITDA, made possible by IC strategic contribution, which is, however, often uneasy to isolate. Residual incremental value, not attributable to specific IC components is allocated within the goodwill cauldron.

Being CFo derived from EBITDA, as depicted in figure 2, the link between key market methods (possibly complementary, rather than alternative) is evident. This is a significant, albeit trivial, finding, somewhat misperceived by the current literature, with an important impact on IC valuation. Figure 2 shows the functional links existing at the level of the profit and loss, balance sheet and cash flow statement. EBITDA is also indirectly reflected in (at least some) income valuation methods, for example, those concerning royalty relief differentials or marginal economic surpluses made possible by IC exploitation, and so it constitutes a significant and precious connection between market and economic methods.

The (replacement) cost approach is apparently not so easily linked to EBITDA, even if the projection of reconstruction costs of the IC portfolio consider operating economic costs that are a core, albeit not exclusive, part of EBITDA. Revenues are missing in the replacement cost method whereas key costs described for example by depreciation are not present in the EBITDA.

Being the cost method deeply linked to accrual accounting, it may suffer from somewhat misleading historical cost convention procedures, which traditionally underestimate IC accounting and, in particular, their potential contribution to value creation. Accrual accounting represents an obstacle for the appraisal of the IC contribution to CFo creation, even if the aforementioned links pivoting around EBITDA may soften these inconveniences (Boujelben & Fedhila, 2011, p. 481).

EBITDA is commonly used as a (misleading) proxy for CFo, representing a kind of price to cash flow multiple, unaffected by leverage and depreciation policies. This proxy is often misleading, since CF_O is derived from EBITDA, considering also Capital Expenditure (Capex) and Net Working Capital variations; while fixed asset investments and their cashless depreciation may hardly be affected by IC, typically not capitalized, accounts payable included in NWC often reflect operating debt connected to costs (for R&D, advertising …) associated with IC.

EBITDA is also a key parameter for assessing debt service capacity, so being linked even to classic capital structure concerns. To the extent that debt is properly served with positive cash inflows deriving (also) from EBITDA (and then CFo, as depicted in Figure 2), a key relationship can consequently be established between market / income valuation models and bankability concerns.

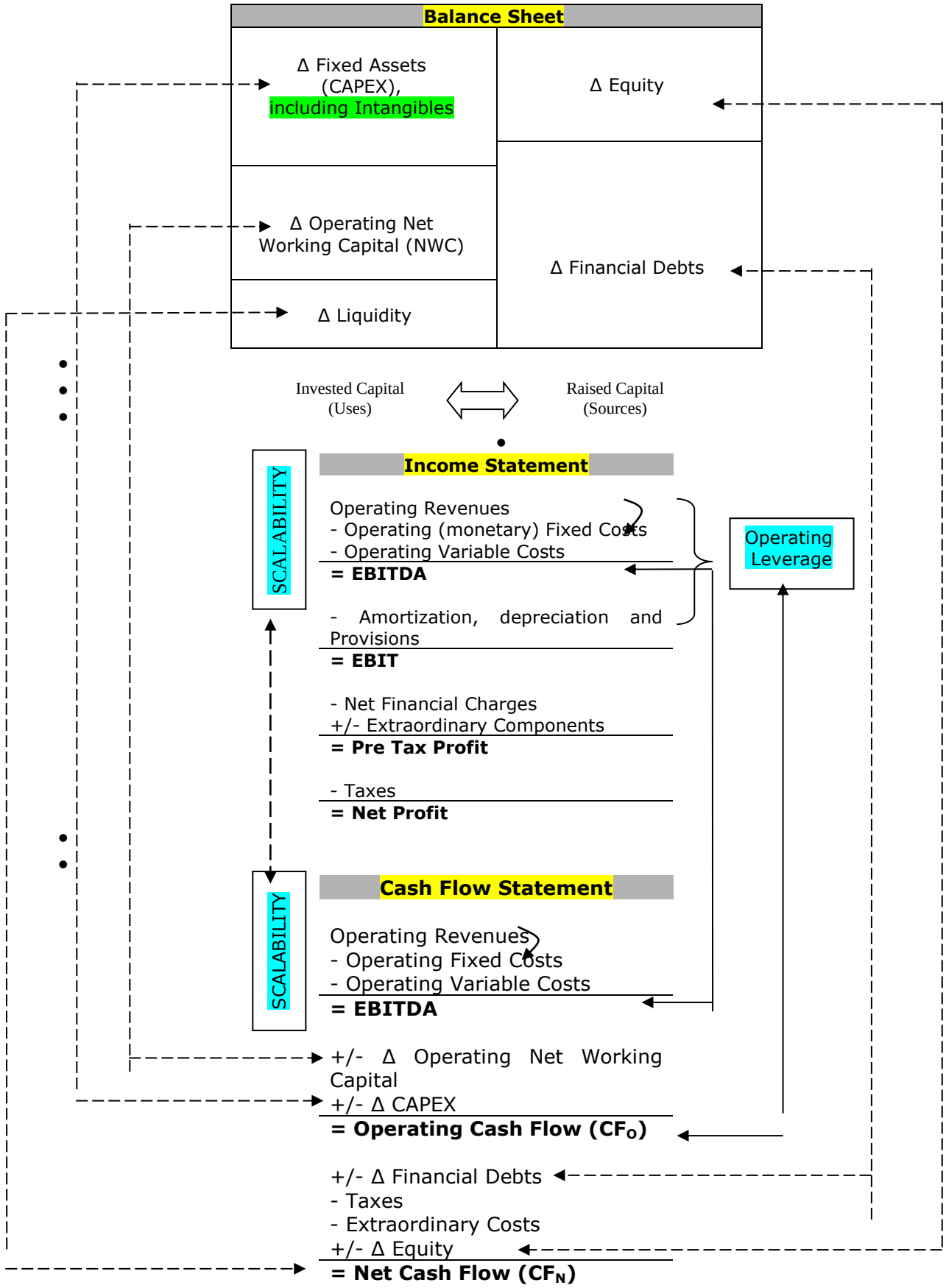
Capacity to serve debt is often measured by EBITDA multipliers over negative interests (and also by cover ratios, described in the appendix); being EBITDA a differential and incremental economic / financial flow from operations, it should conveniently exceed negative interests at least 4-5 times, considering also its contribution to the coverage of other monetary costs, such as for example taxes.

Being IC appraisal so difficult and slippery, synergistic combination of different complementary techniques is, whenever possible, highly recommended.

Traditional financial statements do not provide the relevant information for managers or investors to understand how their resources – many of which are intangible – create value in the future. IC statements are designed to bridge this gap by providing innovative information about how intangible resources create future value. Published IC statements are, however rare documents (Mouritsen, Bukh & Marr, 2004).

Valuation approaches may be synergistically linked to operating and financial leverage, since they contain key accounting and economic/financial parameters, as it will be shown in the next paragraphs. A synthesis of intangible appraisal methods, which may be summarized in a comprehensive valuation dashboard, is depicted in aforementioned Figure 1.

Figure 2. Interaction of balance sheet, profit and loss account and cash flow statement



These evaluation methods may well be linked to the Modigliani & Miller, 1958 (M&M) theorems about optimal capital structure, which will be examined afterwards, and to the key parameters embedded in their formulation:

- Market approach is proxied by M&M proposition I and related cost of capital;
- Replacement cost is based on cumulated reconstruction costs and is also linked to lost opportunities, whose estimate may somewhat refer to differential cumulated EBITDAs and other economic / financial parameters, embedded in M&M formulations;
- Income approach relies on EBIT / EBITDA differential contribution to value.

Coherently with IAS 38 prescriptions, DCF is the key parameter for both accounting and appraisal estimates, so representing the unifying common denominator of cost, income or market based methods, which regularly need to find out their cash part. Cash is also directly linked to debt service capacity, so connecting intangible value creation and its book or market appraisal with its financial coverage, once more remembering that "cash is king".

3 Accounting for scalable intangibles, from operating to financial leverage

Intangibles represent a flexible and resilient key part of competitive advantage, incorporating value-enhancing productivity and representing a fundamental constituent of cash flow production, so making debt servicing sustainable, as it will be shown even in the next paragraphs.

Operating leverage is a measure of how revenue growth translates into growth (Δ Sales) in operating income (ΔEBIT), a key economic margin which incorporates most of the economic and accounting impact concerning intangibles. It is a measure of how risky (volatile) a company's operating income is:

$$\text{Operating} - \text{Leverage} = \frac{\Delta \text{EBIT}}{\Delta \text{SALES}} = \frac{\Delta(EBITDA + Depreciation/provisions)}{\Delta SALES} \quad (1)$$

The factors that influence operating revenues are:

- revenue volumes and margins, influenced by intangible items;
- variable costs;
- fixed costs, mitigated by intangible-driven productivity gains, which may strongly contribute pulling down the economic break-even point.

Operating risk may be reduced and better monitored with synergistic use of intangibles (intangibles are likely to have a positive impact on operating leverage, reducing fixed costs; protecting revenues; enhancing marginality).

Scalability is, broadly speaking, the ability of a business model to generate incremental demand (additional revenues) economically, i.e. without significantly increasing costs. In the presence of a scalable business, the operating leverage works as a multiplier of the EBIT.

Since any change in operating leverage affects a key parameter such as the EBITDA, it also has a financial effect, due to the circumstance that EBITDA is both an economic and financial margin, being represented by the difference between monetary operating revenues and costs, as it has been shown in figure 2. This well known property has important side effects and is a key factor in order to understand why and to what extent financial and operating risk can be associated.

Since operating leverage indicates the translation of revenue changes on EBIT, which may be decomposed into EBITDA + depreciation/amortization, the differential impact of intangibles on EBIT may also be accordingly split: an economic/financial impact on EBITDA and an economic/asset (balance sheet) impact on cashless depreciation and amortization, which are in turn linked to cash flow sensitive Capex and, eventually, to operating cash flow. Any change in the economic marginality, affecting EBITDA and EBIT, so has an impact on operating cash flow, a key parameter in order to assess the financial soundness of the company and its ability to properly serve the debt burden. Operating cash flow, as it is shown in the appendix, is in turn associated with key financial parameters like cover ratio, NPV, IRR, WACC Interactions of key parameters may bring to significant insights; for example if $IRR_{investment}$ > WACC, the return on invested capital exceeds the cost of raised capital, bringing to a positive NPV, with safety resources for debt service and residual incremental value for equity-holders.

4 Leverage and the paradox of intangibles: more guarantees with less collateral?

Financial leverage, represented by the debt to equity ratio, paradoxically interacts with intangibles, since their presence in the asset's portfolio typically decreases residual collateral value, so discouraging debt, whereas unique intangible assets are, on the other side, a fundamental pant of cash generating value, so representing a key factor for debt servicing.

Intangibles and their liabilities (García-Parra *et al.*, 2009). may so decrease leverage, even because tangible equity (i.e. book equity, net of intangibles) is often used in the denominator of the leverage formula, but their presence increases the ability to repay debt, and credit ratings are improved by innovation (Al-Najjar & Elgammal, 2013).

This paradox may be softened with a fair communication of the company's perspectives, so relevant for a proper debt servicing, underlying the key strategic role of intangibles. It may also be noted that tangible assets are increasingly worthless in a standalone

context, their value strongly depending on a continuous interaction with intangibles, like software with hardware.

The circumstance according to which, in an extreme "intangible" context, typical of venture backed start-ups (whose main asset is represented by ideas with strong but uncertain potential for growth), debt is difficult to enforce, and so almost nonexistent, is a symptom of a strong relationship between physical marketable assets and borrowing capacity. In the valuation of intangibles, there is so a remarkable difference between going concern and break-up value, especially in the presence of tailor made and not autonomously tradable assets.

The value of the firm, in an ideal world with complete and perfect capital markets, is unaffected by the way the firm is financed - and so capital structure, in terms of debt to equity ratio, is in principle irrelevant (Modigliani & Miller, 1958). Being raised capital (equity + financial debt) the balancing counterpart of invested capital (net working capital + fixed assets, including intangibles), the financing mix also depends on the assets' composition. Whenever this composition is changed and the firm invests in assets, such as intangibles, that are potentially riskier than those that the debt-holders expected, an asset substitution problem arises.

The value of an unlevered firm equals that of a levered firm, being debt irrelevant, and the market value of a firm (V) depends on its ability to generate operating cash flows (CFo), to be discounted using a consistent parameter such as the weighted average cost of capital (WACC). The formula shows a strong accounting link between operating and financial leverage, particularly evident decomposing the numerator and considering the presence of the debt-to-equity ratio ($D_f/[D_f+E]$) as a weighting part of the cost of debt k_d, net of the fiscal impact (1-t), in the denominator, where also cost of equity k_e is present:

$$V = \sum \frac{CF_O}{(1+WACC)} = \sum \frac{(EBITDA \pm \Delta NWC \pm \Delta Capex)}{k_e \frac{E}{D_f + E} + k_d (1-t) \frac{D_f}{D_f + E}} \quad (2)$$

CFo may be split in its traditional composing entities: EBITDA, variation in Operating Net Working Capital (□*NWC*) and in capital expenditure (□Capex). This formula, which represents Modigliani & Miller (M&M) proposition I, is to be properly linked with M&M proposition II, described in formula (3).

Leverage does not affect unlevered CFo, and also WACC is theoretically unaffected, to the extent that any change in the cost of debt (rising with leverage, due to agency costs) is counterbalanced, in an ideal world, by symmetric changes in the cost of equity.

In synthesis, due to a kind of self balancing effect, any leverage (Df/E) change affects weighting factors of WACC but it should not (optimally) modify it, nor should it affect the parameters in the numerator (EBITDA, NWC, Capex).

Financial leverage does not affect the numerator (being CFo accounted for before debt servicing), whereas also the WACC in the denominator is unaffected by debt to equity changes, where risk is shifted from shareholders to debt-holders when leverage grows, resulting in a zero sum game balancing effect, again (only) in an ideal frictionless world.

As shown in figure 2, CFo (whose impact on IC is described in Boujelben & Fedhila, 2011), derives from EBITDA, which is simultaneously an economic and a financial margin (flow), representing a key link between Income and the Cash Flow statements; EBITDA is also strictly linked to EBIT, which is the target component of operating leverage, sensitive to operating revenue changes.

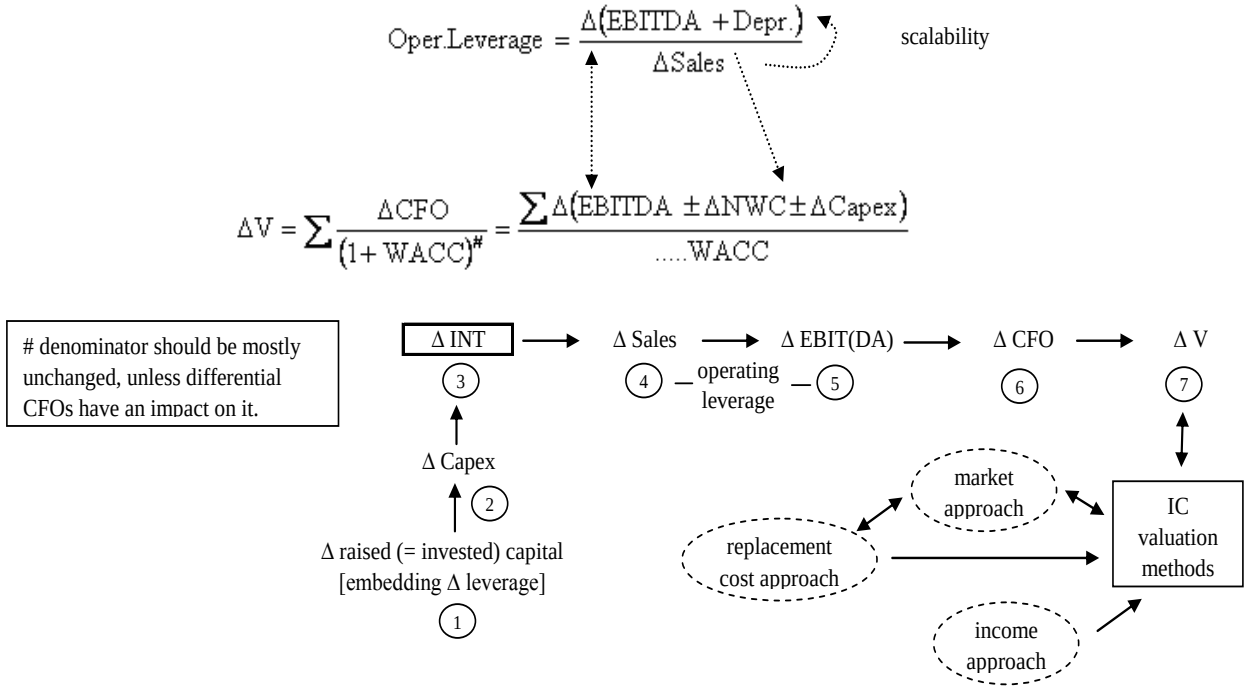
Debt capacity is a direct function of the assets' composition and its intrinsic riskiness, but assets have to be considered, rather than stand-alone items, a synergistic bundle of tangible and intangible components, consistently with the *Coasian* theory of the firm and so incarnated by an integrated nexus of contracts, where know-how and goodwill represent the invisible glue behind intangible driven value, which represents a kind of knowledge-based equity (Maditinos *et al.*, 2011).

In the presence of intangible investments, lending should conveniently pass from an asset-based to a cash flow-based approach, where liquidity contribution is worth more than (tangible) asset-backed leverage. Even if the breakup value of intangibles may be negligible, especially if they may not be autonomously traded, the probability to depart from a going concern scenario may be less likely in the presence of a good intangible portfolio. Asset substitution (from safer to riskier asset composition) may so, in practice, misrepresent the company's solidity, exaggerating its risk profile. Intangibles, in pills, are linked to weaker if any guarantees, within a less likely scenario of enforcing them. IC unspecific value, ontologically unfit to be used as "material" collateral, yet has positive debt service implications, through its cash generating capacity.

Intangible investments do not necessarily absorb more debt, whereas they can ignite productivity gains (roughly measured by EBITDA increases), consequently easing bankability.

The value chain that links leverage to intangibles is represented in Figure 3, which contains a dynamic flow chart, starting from leverage and raised capital, to be invested in fixed assets (Capex), such as intangibles, which boost sales and then, consequentially, incremental EBITDA and operating cash flows, ultimately increasing differential value, linked to IC valuation methods and, through operating value, to intangible driven scalability.

Figure 3. The Leverage – intangibles value chain



5 Information asymmetries and debt rationing

Information asymmetries have a paradoxical impact on intangibles, since, in many cases they are needed and looked for, deterring imitation, as it happens with know-how and, to a lesser extent, with patents, whereas in other cases they cause communication problems that may damage brands and the external perception of the corporate image. Information asymmetries are so intrinsically embedded in intangible items, whose value is uneasy to account for and disclose (Arvidsson, 2011; Singh & Kansal, 2011; Kristandl & Bontis, 2007). The prudential exclusion of home-grown intangibles from the balance sheet increases information asymmetries, hampering comparability.

Appraisal and diffusion of the company's market value, with particular reference to its somewhat mysterious intangible component, may so be misrepresented, causing market failures and misbehavior, in the form of adverse selection, moral hazard or other corporate governance criticalities.

Since intangible assets are intrinsically difficult to estimate, their value may be misperceived and downgraded, with market failures that typically interest investors, in the form of (potential) debt-holders or shareholders, which may be frightened or discouraged.

Debt capacity grows in the presence of tangible assets with potential collateral value given by applicable guarantees, as confirmed by the seminal paper of Jensen & Meckling (1976), whose theory of the firm is based on agency problems created by the coexistence of debt and outside equity with inside penniless managers.

Intangibles intrinsically incorporate information asymmetries (Leland & Pyle, 1977; Aboody & Lev, 2000) and inside managers command superior information over the firm's value and prospects, if compared to outsiders; information asymmetries bring to sub-optimal decisions and may prevent capital or debt collection, so causing debt rationing problems which may block financing of valuable – and IC sensitive - projects.

Corporate governance failures and conflicting interests among different stakeholders (from conspiratorial IC managers to ... sometimes gullible lenders) are also exacerbated by problematic debt monitoring and control rights in the presence of undetectable intangibles. Legal protection of debt-holders, including the right to grab collateral assets, and the (theoretical) right to liquidate the business, are weakened by the presence of intangibles with little if any alternative use.

Information asymmetries are constantly nurtured by noise (Black, 1986) as a cause of uncertainty and inefficiency, contrasted with (proper and fair) information. Arbitrary noise is costly and it naturally produces volatility through biased and distorted estimations, hampering discrimination, which is essential in order to assess the actual impact of intangibles within the firm. Due to its slippery boundaries and immaterial plasticity, hardly observable and hazy intangibles are intrinsically noisy, and their differential impact on economic and financial flows is difficult to estimate and distinguish, as well as their potential replacement cost.

Noisy and cloudy investments in intangibles, typically stir up the aforementioned asset substitution problems, to the extent that companies may exchange their low risk assets for riskier investments; since debt-holders typically have a fixed compensation, the higher risk put on assets is not typically compensated by higher rewards, and consequently there is a risk transfer from shareholders to debt-holders.

All these well known corporate governance problems have to be properly managed, aligning the interests of inside agents with those of external principals, with positive and value enhancing side effects, such as monitoring and accountability.

IC sharing among different firms is an intermediate solution between internal protection and sale (or, to a milder degree, licensing).

To the extent that information asymmetries and secrecy voluntarily soften with IC and knowledge sharing, economically stimulated by increasingly synergistic value chains (as the one represented in Figure 3), inappropriate behaviours (e.g., of counterfeiter competitors) may accordingly intensify and strategic differential value may be threatened. Progressive evolution from the industrial to the information age subverts traditional value chains, with an impact even on conventional lending, with a shift from asset-backed tangible collateral to hardly marketable but value enhancing intangibles.

The paradox of (elsewhere much appreciated) comparability is that, in many cases it represents a symptom of weak value, especially if concerning brands or patents, whose uniqueness (and consequent incomparability) is possibly the strongest fundament of intrinsic value. It may so be affirmed that value-destroying information asymmetries are, for certain contradictory features, a positive source of value; whereas these two different aspects represent a zero sum game, approaching Pareto optimality, remains however a complex issue, uneasy to be generalized. More interdisciplinary research is needed even for this not trivial aspect.

Imitation of unprotected intangibles, intrinsically reduces information asymmetries, again with a controversial impact on value, producing trickle down and spill-over externalities but also destroying monopolistic secrecy and, with it, egoistic reward for innovative efforts, up to the point of discouraging R&D. Legal infringements are increasingly likely in a technological environment where information is easier to ... copy and paste, storing and transferring it in real time, up to the point of making it publicly available through the libertarian Web.

Some mitigation strategies may soften information asymmetries:

- since the presence of intangibles increases the company's payoff upside potential, residually attributable only to equity-holders; issue of convertible debt may soften this risk / return asymmetry (Smith & Warner, 1979);
- voluntary disclosure of intangible value (Garcia-Meca *et al.*, 2005; Kristandl & Bontis, 2007; Singh & Kansal, 2011) may bridge information gaps, softening asymmetries, binding managerial opportunism and easing value diffusion and sharing, with a simplifying impact even on (proper) lending contract design;
- introduction of debt covenants (Smith & Warner, 1979); for example, dividends are typically restricted in the presence of relevant intangibles (as it happens with start-ups);
- reduction of the debt's extension: operating debt, which backs intangible investments, is typically short termed, and frequent repricing, with an implicit reimbursement option for the creditor, reduces managerial discretion, easing monitoring and softening information asymmetries;
- pecking order hypothesis, where self financing (driven by EBITDA, up to undistributed net profits) fully reflect the intangible contribution, being hierarchically preferred to (increasingly risky) debt issuance and, ultimately equity inflows;
- protection of intangibles, remembering that if intangibles can efficiently and unnoticeably be transferred by free riding managers (often with the complicity of equity-holders), then creditors may be damaged;
- proper accounting representation of the incremental impact of intangibles on the income statement, which may soften info asymmetries that traditionally concentrate on the balance sheet, where intangibles are typically underrepresented.

6 Some empirical evidence from Italian industries

Some empirical evidence about the relationship between intangibles and value can be extracted from the database of Mediobanca's annual statistical survey of principal Italian companies.

The financial aggregates cover 2,035 companies, typically representative of the Italian manufacturing and service industries, over the seven-year period 2006-2012. According to the most recent statistics from ISTAT, the Italian Statistics Office, the manufacturing businesses in the 2,035-company group represent 47% of Italy's total industrial sales.

The sample, reported in Table 1. (with average data 2006-2012), is comprehensive and representative, but also somewhat noisy and blurred, since it hardly allows to properly focus on intangibles, collecting "meso" industry data, which are hardly suitable for deeper micro analysis.

Table 1. Intangible intensity and profitability from a sample of Italian industrial companies

Sample / Industry	Intangible intensity= Intangibles / Total assets	EBITDA/Sales (Cash ROS)	Intangibles / EBITDA	Intangibles (% on Assets) / Cost of Debt
general sample sub-sections				
Services companies	28.06%	22.72%	3.28	3.56
Foreign controlled companies	17.41%	10.67%	1.74	2.99
Private Companies	17.20%	10.55%	2.19	2.52
Cumulative data	**12.80%**	**10.99%**	**1.84**	**2.03**
Companies in constant loss	11.25%	-9.12%	-2.76	1.11
Companies in steady profit	8.96%	14.33%	0.96	1.65
Public Enterprises	5.37%	12.39%	1.04	1.00
Industrial companies	5.31%	8.24%	0.86	0.86
Medium sized companies	2.64%	7.71%	0.36	0.55
industries				
Public services	44.28%	41.82%	3.55	5.97
Tertiary companies	27.15%	23.77%	3.13	4.24
Different companies	15.03%	15.08%	1.76	2.25
Food-canning	14.50%	7.95%	2.02	2.90
Diary Food	12.95%	6.03%	1.95	2.84
Clothing	12.49%	11.06%	1.32	2.03
Electronics	10.16%	6.79%	2.01	1.50
Leather goods	10.01%	11.98%	0.79	1.63
Food and alcohol	9.42%	11.34%	1.18	2.04
Transportation construction	9.00%	4.03%	5.57	1.03
Chemical	7.93%	4.46%	1.89	1.22
Print and publishing	6.46%	7.19%	2.19	1.51
Retail	6.37%	5.80%	1.13	1.82
Confectionery-foods	6.32%	11.89%	0.47	1.43
Mechanical sector	6.24%	8.99%	0.87	0.91
Glass	5.75%	14.68%	0.61	1.40
Pharmaceutical and cosmetics	5.45%	12.96%	0.48	1.09
Wood and forniture	5.20%	6.28%	1.10	1.00
Appliances radio television	4.84%	4.84%	1.01	0.69
Energy	4.58%	9.08%	0.66	0.83
Different foods	3.80%	6.15%	0.51	0.72
Paper	2.66%	7.42%	0.45	0.48
Textile	2.39%	7.59%	0.46	0.44
Plant	2.23%	6.52%	0.80	0.21
Products for construction	1.40%	9.61%	0.46	0.25
Transport	1.25%	8.38%	-0.29	0.38
Rubber and cables	1.05%	6.08%	0.20	0.18
Metallurgical	0.61%	6.75%	0.10	0.10

Source: http://www.mbres.it/en/publications/financial-aggregates-italian-companies

Empirical evidence from the selected sample unequivocally shows that intangible intensity (intangibles / total assets) is positively linked to profitability, measured by parameters such as EBITDA over sales, a ratio that represents a kind of "cash" Return on Sales (ROS), and Intangibles over EBITDA, a complementary multiplier which times intangibles recorded in the balance sheet to EBITDA.

Intangibles are also compared to the cost of collected debt, with a further multiplier whose ranking is again consistent with the aforementioned findings, showing an inverse proportionality between intangible intensity and cost of collected debt.

The overall sample sub-sections are to be compared with benchmarking cumulative data, somewhat in the middle of the ranking.

Interesting findings may also be inferred from the industry breakup, where 28 different sectors are ranked, showing an intangible intensity which is somewhat consistent with the overall sample and, again, positively linked to profitability.

7 Conclusion

If companies can hardly survive without increasingly sophisticated intangibles, even their sponsoring banks are more and more challenged by path-breaking changes in the strategies of their clients. This is why intangible valuation is so significant (also) for lending institutions. Lack of proper intangible "soft" lending may also cause credit misallocation and consequent market failures.

Starting from these premises, this paper has addressed many interrelated issues, all pivoting around intangible valuation and consequent ability to generate enough cash in order to properly serve debt.

The main propositions / theoretical issues and findings can so be summarized:

Proposition 1 – *Market and Income intangible evaluation methods and, to a lesser extent, replacement cost methods, are linked by common accounting parameters, such as EBITDA.*

Proposition 2 – *Intangible-driven EBITDA is linked to scalable operating leverage and they are both related to operating cash flows, so mattering for debt service ability.*

Proposition 3 – *Asset substitution, is due to increase the company's riskiness, but intangible investments, albeit lacking collateral value, may also actively improve economic and financial margins, easing debt service.*

Proposition 4 – *Intangible-driven Enterprise Value is positively related to bankability and debt coverage.*

Proposition 5 – *In case of default, IC is almost valueless, but its very presence in the (original) going concern situation makes default less likely.*

More research is needed, considering in particular the still obscure relationship between assets' composition and value, strictly linked to debt service ability, in the presence of variegated intangibles.

The hierarchy and composition of cash funding represent another key issue, waiting for deeper investigation: according to the Pecking Order Hypothesis, popularized by Myers & Majluf (1984), the cost of financing increases with asymmetric information - and so, with intangibles. Companies prioritize their sources of financing, first preferring internal financing, and after debt, lastly raising equity as an expensive "last resort". Since intangibles stand out as a key income (EBITDA) liquidity driver, their strategic presence is consistent with financial pecking order (Degryse, de Goeij & Kappert, 2012); accordingly, when investments in intangibles are significant, such as in growth type firms, and debt ability is limited, firms eventually rely on private or other external equity (Baeyens & Manigart, 2006; Vanacker & Manigart, 2010; Wu & Yeung, 2012). Deeper analysis and research is required even for this increasingly critical value driver problem, especially in a recessionary capital rationing situation.

IAS compliant DCF appraisal, albeit being recognized as a preferred accounting option for intangibles, still represents an uphill goal, so demanding additional fine tuning.

The differential impact of intangibles on value, starting from Porter's competitive advantage, is a well known cornerstone of IC identification and autonomous valuation, but its detection is still noisy and troubled, also due to accounting problems, related in particular to self generated intangibles: capturing and measuring hidden value, to be extracted from intangibles, remains an uphill task.

Information asymmetries preserve but conceal intangible value, with a double edged sword impact even on the bankability, again demanding deeper research, uneasy to model and generalize.

Value is increasingly and crucially coalescing around intangibles, the foremost breadwinning strategic driver behind differentiation, with its marginal economic and financial spillovers and externalities.

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Appendices

Appendix. Connections between operating leverage and key financial ratios

ITEMS	FORMULA	CONNECTIONS WITH OPERATING LEVERAGE
OPERATING REVENUES	Operating revenues (including active royalties and boosted by IC assets) - monetary and operating fixed costs * - monetary and operating variable costs * **= EBITDA** - amortization, depreciation and provisions **= EBIT** +/- Δ Capital Expenditure (CAPEX) +/- Δ Operating Net Working Capital **= OPERATING CASH FLOW = CF_O** * minimized by appropriate use of know-how, patents and other IC assets.	Growing operating revenues generate an increase in EBIT, depending on the fixed / variable costs mix.
EBITDA		EBITDA, given by the difference between operating revenues and (monetary) operating costs, influences Operating Cash Flow. The same happens with EBIT, which additionally considers non monetary operating costs (depreciation, amortization, provisions).
EBIT		
OPERATING CASH FLOW		Increases in operating revenues increase EBITDA, EBIT and Operating Net Working Capital, normally pushing up Operating Cash Flow.
Weighted Average Cost of Capital (WACC)	$WACC = k_e \frac{E}{D_f + E} + k_d (1-t) \frac{D_f}{D_f + E}$	If operating revenues grow, EBIT and consequently net profit should increase, with an induced Equity growth; if equity grows, ceteris paribus leverage decreases and there is a transfer of risk from debt-holders to shareholders; to the extent that this risk transfer is symmetric, WACC should be unaffected.
Net Present Value $NPV_{project}$	$NPV_{project} = \sum_{t=1}^{n} \frac{CFO_t}{(1+WACC)^t} - CF_0$	If EBITDA grows, Operating Cash Flow (CFO) increases, with a positive impact on NPV, especially if WACC decreases.
Internal Rate of Return $IRR_{project}$	$NPV_{project} = \frac{CFO_1}{1+IRR_{project}} + \frac{CFO_2}{(1+IRR_{project})^2} + \ldots + \frac{CFO_n}{(1+IRR_{project})^n} - CF_0 = 0$	If Operating Cash Flow grows, NPV might increase, then also IRR grows, increasing the financial break-even point; the project is more easily bankable.
Average Debt Service Cover Ratio	$ADSCR = \frac{\sum_{t=1}^{n} \frac{CFO_t}{D_{f\,t} + I_t}}{n}$	Operating Leverage is strictly connected with average debt service cover ratio - a typical debt metric - which strongly depends on Operating Cash Flow. If cumulated CFOs grow, then financial debt may be reduced.
(Financial) Leverage[1]	$k_e = [WACC + (WACC - k_d) * D_f/E] (1-t)$ where: t = tax rate	If the difference (WACC - k_d) between the weighted average cost (return) of capital and the cost of debt is positive, then a leverage above unity (where $D_f > E$) enhances this positive difference, with a consequential positive effect on the cost (return) of equity.
Enterprise Value	EBITDA * n = Enterprise Value	EBITDA is connected to Operating leverage, as shown in formula (1)
EBITDA / financial charges	EBITDA / financial charges	EBITDA should be consistent enough to cover financial charges and other monetary costs; this parameter deeply changes across time, being negative in the construction phase and sometimes even at the beginning of the management phase; higher financial charges, embodied in the cost of debt and in the WACC, decrease the margin multiplier (EBITDA should be at least 5-6 times the financial charges, depending on the amount of the other monetary costs), with a direct impact on cover ratio and leverage.

[1] This is the standard Modigliani & Miller proposition II, adjusted for taxes. The M&M theorem states that, in a perfect market, how a firm is financed is irrelevant to its value.