Original Article

"APV under the Microscope: A Critical Assessment of its Valuation Supremacy in Merger and Acquisition"

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ABSTRACT

This study investigates the efficacy of two prominent valuation methods, Weighted Average Cost of Capital (WAAC) and Adjusted Present Value (APV), in assessing the financial performance and worth of companies with complex financial structures and varying cash flows. Our analysis reveals that APV, which considers tax benefits and other non-operating items, provides a more comprehensive and accurate valuation compared to WAAC. The results show that APV valuations are lower than WAAC valuations, considering significant tax benefits and debt. This research contributes to the ongoing debate on valuation methods and provides insights for investors, analysts, and researchers seeking to accurately value companies with complex financial profiles.

INTRODUCTION

Merger and Acquisition refer to strategic business activities where two or more companies come together to create a new entity or one company acquires another. These transactions are driven by various motives, ranging from growth and increased market share to cost synergies and strategic positioning. M&A plays a vital role in the business world by facilitating market consolidation, fostering strategic growth through rapid market entry or diversification, and achieving economies of scale through combining resources and operations. Synergies are central to M&A, as the combined entity aims to create more value than the sum of its parts, leading to improved cost efficiencies, productivity, and profitability. M&A transactions provide companies with access to critical resources, including intellectual property, technology, talent, and distribution networks, enhancing their competitiveness andinnovation. Diversification through M&A also serves as a risk mitigation strategy, allowing companies to spread risks across different markets or industries. Additionally, M&A enables companies to strategically reposition themselves in response to industry trends, competitive pressures, or emerging opportunities. The ultimate goal of successful M&A is to create value for shareholders by improving financial performance, increasing stock prices, and delivering dividends resulting from realized synergies and efficiencies. However, executing M&A requires meticulous planning, thorough due diligence, and effective post-mergerintegration to ensure success and value creation for all stakeholders involved. This process is closely tied to merger and acquisition valuation, which assesses the financial worth and potential synergies between the merging entities. Valuation involves evaluating the assets, liabilities, and overall financial health of the target company, determining the fair purchase price, and determining areas where the combined entity can derive value. During the valuation process, various methods are employed to arrive at a comprehensive understanding of the target company's worth. These methods include Comparable Company Analysis (CCA), which benchmarks the target against similar publicly traded entities, and Precedent Transactions Analysis (PTA), which draws insights from past industry transactions to establish valuation benchmarks. Additionally, Discounted Cash Flow (DCF) Analysis estimates the present value of future cash flows, offering a forward-looking perspective on the target's financial health. The valuation process is not solely a financial exercise; it also involves a strategic assessment of how the merging entities can create value together. This includes identifying operational synergies, cost efficiencies, and revenue enhancements that may arise from the combination. Furthermore, the evaluation considers potential risks and challenges, such as cultural differences or integration complexities, that could impact the success of the merger or acquisition. Traditionally, reliance on the weighted average cost of capital (WAAC) in merger and acquisition (M&A) valuation has been prevalent for a long time. This is because WACC has been considered a dominant tool in M&A valuation, providing a single discount rate that simplifies analysis and facilitates comparison with alternative investments. Moreover, WACC helps quantify the opportunity cost of capital by representing the minimum

return shareholders expect on their investments. Thus, if an M&A deal generates returns above WACC, it creates shareholder value. Additionally, WACC considers both debt and equity costs, reflecting the actual financing mix of the company. This gives a more holistic picture than relying solely on equity cost. However, relying solely on WACC in M&A valuation has its limitations. Firstly, it assumes a constant cost of capital, whereas M&A can impact a company's capital structure and risk profile, potentially changing its WACC. Secondly, WACC struggles to capture potential synergies or value creation arising from the M&A, which can significantly impact the combined entity's future cash flows. Lastly, WACC may not be suitable for comparing companies across different industries with varying risk profiles and capital structures. Therefore, modern M&A valuation practices are moving beyond the limitations of WACC. The Adjusted Present Value (APV) methodology is a compelling alternative to the conventional Weighted Average Cost of Capital (WACC) approach in merger and acquisition (M&A) valuation. It introduces a nuanced and comprehensive framework that challenges the reliance on methods such as WACC. The APV methodology stands out for its ability to dissect the various elements influencing the value of a target company with precision and adaptability. Unlike conventional methods using a uniform discount rate, APV employs a modular approach. It breaks down the valuation process into distinct components, which is advantageous in the context of M&A, where changes in capital structure are prevalent. First, the approach determines the Unlevered Cash Flows (UCF), which stand for the project's cash flows before any financing factors are taken into account. These factors include operational income, expenses, taxes, and capital expenditures. Next, it takes into consideration the tax shield, which represents the tax advantages derived from paying interest on loan financing. The tax shield is discounted using the cost of debt financing, which is the interest rate that lenders demand. The UCFs are also discounted using the cost of equity financing, which stands for the return that equity investors anticipate. The present value of the tax shield and the UCFs are added together to get the APV. APV takes into consideration possible changes brought about by leveraging or deleveraging throughout an acquisition, acknowledging the dynamic nature of the cost of debt. By addressing these components individually, APV enhances the accuracy of valuation analyses, offering a more detailed understanding of the value creation or destruction associated with M&A activities.

The flexibility of APV is a notable asset, allowing for a nuanced evaluation of the diverse financial characteristics inherent in M&A transactions. This adaptability is crucial in recognizing that the financial implications of an acquisition may extend beyond a uniform discount rate. It provides decision-makers with a more sophisticated and tailored approach to valuation. As M&A activities become increasingly complex, the demand for precision and comprehensiveness in valuation processes has grown. APV stands out as a valuable methodology that aligns with these evolving needs, offering financial decision-makers a robust framework to navigate the multifaceted terrain of mergers and acquisitions

The theoretical foundation for evaluating value creation in mergers and acquisitions (M&A) through specific components, such as synergies, intellectual property, and operational improvements within the Adjusted Present Value (APV) framework, is deeply rooted in a holistic understanding of the multifaceted nature of corporate combinations. Synergies, a key component acknowledged by APV, are viewed theoretically as potential sources of operational efficiency, cost reduction, and revenue growth resulting from the amalgamation of two entities. APV's explicit recognition of synergies reflects a theoretical commitment to the idea that the merged entity can achieve a level of value greater than the sum of its parts. Intellectual property, another critical consideration within the APV framework, is theoretically positioned as a vital asset contributing to a company's competitive advantage. The APV method acknowledges the strategic significance of intellectual property in M&A, aligning with the theory that acquisitions can provide increased access to valuable intangible assets. This recognition is grounded in the understanding that intellectual property contributes to the competitive edge, innovation, and long-term sustainability of the combined entity, thereby enhancing overall value. Operational improvements, the third component within the APV framework, are theoretically positioned as the result of streamlined processes, optimized workflows, and the leveraging of combined resources to enhance overall operational efficiency. APV's acknowledgment of operational improvements as a distinct element influencing valuation reflects the theoretical perspective that a well-executed merger can lead to synergistic operational benefits, such as cost reductions and increased productivity. The incorporation of operational improvements into the APV methodology aligns with the belief that these enhancements contribute to increased profitability, consequently creating additional value for shareholders. In essence, the theoretical underpinning of APV's consideration of synergies, intellectual property, and operational improvements signifies a commitment to a comprehensive understanding of M&A transactions. Through the identification and measurement of these particular elements, APV upholds the theoretical underpinning that the actual value of a merger transcends conventional financial measurements, incorporating the more extensive strategic and operational benefits resulting from the cooperative union of firms.

LITERATURE REVIEW

Miles and Ezzell (1980) examine in their study published in the Journal of Financial and Quantitative Analysis the relationship between WACC, ideal capital markets, and project life. By elucidating the relationship between WACC and project life, they hope to shed light on its applicability to merger valuation. The report emphasizes how crucial precise project-levered cash flow valuation is to sound financial management capital budgeting decisions. It draws attention to the claim made by the MM model that the market value of an unlevered stream plus the market value of interest payment tax savings equals the project's levered cash flow. By including the APV technique, Myers (1974) expands on this model and highlights the importance of taking both finance and investment decisions into account when doing capital budgeting analysis.

This provides a brief overview of the key concepts that are necessary in understanding merger valuation using WAAC

and APV methodologies. Fernandez (2002) examines the consistency of discounted cash flow method through ten different approaches. The primary objective of the study is to address the fundamental question: Do discounted cash flow valuation methods always yield the same value? Through a comprehensive analysis, Fernandez (2002) presents a synthesized compendium of ten valuation methods, including free cash flow, equity cash flow, capital cash flow, adjusted present value, and others. Notably, the study explores the nuances of each method and evaluates their consistency in deriving company valuations. The findings of Fernandez (2002) suggest that all ten valuation methods consistently produce the same value, underscoring the robustness and reliability of DCF-based approaches. However, the research acknowledges the presence of disagreements among various theories of firm valuation, particularly concerning the calculation of the value of tax shields (VTS). Fernandez (2002) meticulously examines nine different theories pertaining to VTS, shedding light on the complexities inherent in company valuation practices The study conducted by Fernando Llano-Ferro, titled "The Weighted Average Cost of Capital (WACC) for Firm Valuation Calculations" and published in the International Research Journal of Finance and Economics in 2009, explores the significance of WACC in finance and proposes an alternative method for its calculation. Llano-Ferro identifies errors in the traditional approach to calculating WACC and presents a new formula aimed at improving accuracy. However, this paper critically reviews Llano-Ferro's study, pointing out potential weaknesses in the assumptions underlying the new WACC formula.

The review also provides a different method for figuring out WACC in relation to firm valuation. The authors analyze the WACC values from the conventional and alternative approaches and evaluate how well they correlate with actual business values to substantiate their criticism. The results show differences between the real results and the typical WACC- derived business value, whereas the alternative method produces more accurate firm values by taking the market value of debt and equity into account.

The paper "On the Equivalence between the APV and the WAAC Approach in a Growing Leveraged Firm" which was published on January 2008 in the European Financial Management Journal, examines the suitability of the Adjusted Present Value (APV) and Weighted Average Cost of Capital (WACC) approaches in the context of a growing leveraged company. The research demonstrates differences between the two approaches in a growing business scenario, even if both approaches produce the same outcome in a steady-state context. The authors identify the presumptions under which the two techniques coincide and offer a straightforward model to evaluate tax savings in a developing company. According to the study, applying the WACC model to a steady-growth scenario may result in strange assumptions about the discount rates that should be used for calculating tax shield.

The WAAC formula includes discounting debt tax shields that are associated with existing debt using the cost of debt (kd) and a combination of the cost of unlevered equity(ku) and (kd) for debt tax shields relevant to new debt resulting from the company growth. The paper addresses the discounting procedure's inconsistency and suggests the APV approach's preferred features in such situations. The authors' analysis adds to the comprehension of valuation methods for growing leveraged firms and offers insights into the practical implications of using WACC and APV approaches.

Jaime Sabal's article in the Journal of Business Valuation and Economic Loss Analysis delves into the decision-making process between Weighted Average Cost of Capital (WAAC) and Adjusted Present Value (APV) for valuing projects and firms. These two approaches have gained prominence as valuation techniques following the pioneering work of Miller and Modigliani in 1958 and 1963.

RESEARCH METHODOLOGY
Research Objectives:
1. To evaluate the applicability and reliability of APV in merger and acquisition activities.
2. To assess the value creation of merger and acquisition deals through real-world company case study.

Research Design:
1. The study uses a quantitative research design to analyze RIL and DIS's financial data to conduct a comprehensive valuation analysis.
2. The study compares and contrasts the valuations obtained from WAAC and APV methods using descriptive and analytical approaches.

Data Collection:
1. Financial data of RIL and DIS were gathered from publicly available sources, including annual reports and financial statements
2. The data encompasses historical financial information such as revenue, profit, cash flow, debt, and forecast data for future periods.

Data Analysis:
1. The data was analyzed using APV and WAAC methods to estimate the valuations of RIL and DIS.
2. The results were compared to evaluate the suitability of methods in valuing companies with varying cash flow patterns, high debt, and significant tax benefits.

Statistical Tools:

1. The data analysis and valuation calculations were performed using Microsoft Excel.

Limitations:
1. The study only examines WAAC as an alternative to APV and does not investigate other approaches.
2. The analysis is based on historical data and may not reflect current market conditions accurately.
3. The study concentrates on companies with two different corresponding rates, so the valuation may not be in line with the actual market valuations.

Scope of the study:
1. The study aims to provide investors, analysts, and researchers insights to contribute to the ongoing debate on valuation methodologies.

ANALYSIS

Valuing a company is a fundamental aspect of financial analysis as it provides insights into its financial health, growth potential, and overall worth. Through this research, the researcher delves into the valuation of two prominent companies: Reliance Industries Ltd (RIL) and The Walt Disney Company (DIS). The study aims to uncover the true value of these companies and assess their performance in the industry and market conditions through rigorous financial modeling and evaluation.

The valuation process involves conducting a comprehensive analysis of the historical financial records of Reliance Industries Ltd (RIL) and The Walt Disney Company (DIS). This includes examining financial indicators such as Profit After Tax (PAT), Depreciation (DEP), Cash Flow After Tax (CFAT), Changes in Working Capital, and Changes in Investments. These insights provide valuable information about the companies' revenue, profitability, and investment patterns. The historical datasets are crucial for predicting future cash flow and determining the intrinsic values of the respective companies.

The companies' future cash flows have been forecasted using established valuation methodologies like the Weighted Average Cost of Capital (WACC) and Adjusted Present Value (APV). The WACC model helps discount future cash flows at a combined rate that includes both equity and debt capital costs, providing a comprehensive evaluation of the companies' total capital cost. On the other hand, the APV approach allows for a separate assessment of the value of operational assets and the tax advantages associated with leverage, offering a nuanced understanding of the companies' financial standing.

Analysis 1: Valuation of Companies by Weighted Average Cost of Capital (WAAC).
Reliance Industries Limited (RIL)

Table 1: Statement of Free Cash Flow (in Cr.)

Particulars	2019	2020	2021	2022	2023
Profit after Tax	21493	23850	29285	34955	21493
Add: Depreciation and Amortization	10326	12934	14113	18668	10326
Cash Flow after Tax	31819	36784	43398	53623	31819
Less: Changes in Working Capital*	80690	44512	65405	(52162)	80690
Less: Changes in Investments	123667	79345	20286	(178688)	123667
Free Cash Flow	(172538)	(87073)	(42293)	284473	(172538)

Note: Working Capital = Current Assets – Current Liabilities
Changes in Working Capital = Working Capital (C.Y) – Working Capital (P.Y) Changes in Investment = Working Capital (C.Y) – Working Capital (P.Y)

Table 2: Valuation of the company through Projected Cash Flow (in Cr.)

Particulars	2024	2025	2026	2027	2028
Projected Cash Flow	(44692)	(63288)	(106650)	(213870)	(510368)
WAAC	22%	21%	20%	24%	22%
Discounted Cash Flow	(36632)	(52304)	(88875)	(172475)	(418334)
Terminal Value	-	-	-	-	(17012279)
Discounted Terminal Value	-	-	-	-	(6294531)

$Total\ Value\ (WAAC) = Discounted\ Cash\ Flow + Discounted\ Terminal\ Value$
= (768620) + (6294531)= ₹7063151

The Walt Disney Company (DIS)

Table 3: Statement of Free Cash Flow (in Cr.)

Particulars	2019	2020	2021	2022	2023
Profit after Tax	264202	(426189)	114236	145572	44849
Add: Depreciation and Amortization	582290	775530	741706	746846	773374
Cash Flow after Tax	846492	349341	855943	892419	818223
Less: Changes in Working Capital*	(1085990)	2955882	(820959)	(745271)	(283601)
Less: Changes in Investments	86382	34652	38631	(126505)	(25865)
Free Cash Flow	1846100	(2641194)	1638270	1764195	560487

Note: Conversion Rate: 1USD= ₹ 82.90

Table 4: Valuation of the company through Projected Cash Flow (in Cr.)

Particulars	2024	2025	2026	2027	2028
Projected	661375	920898	151305	2933496	6711129
WAAC	12%	11%	11%	15%	15%
Discounted Cash Flow	590513	747421	1106340	1677236	3336617
Terminal Value	-	-	-	-	(111220571)
Discounted Terminal Value					(55296280)

$Total\ Value\ (WAAC) =\ Discounted\ Cash\ Flow + Discounted\ Terminal\ Value$
= 7458127 + (55296280)
= ₹(47,838,153)

Analysis 2: Valuation of Companies by Adjusted Present Value(APV).
The valuation analysis comprises a detailed scrutiny of the financial data concerning Reliance Industries Ltd (RIL) and The Walt Disney Company (DIS), with particular attention directed towards the calculation of Free Cash Flow (FCF) and the subsequent projection of cash flows spanning from 2024 to 2028. This examination extends to the computation of the Adjusted Present Value (APV), employing the projected cash flows and the present value of tax shields to assess the operational efficacy of the APV framework.
In the initial step of the analysis, the focus lies on computing the Free Cash Flow (FCF) based on historical financial data ranging from 2019 to 2023. This process involves the deduction of changes in Working Capital and Investments from the Cash Flow after Tax for each year within the specified timeframe.
$Unlevered\ Free\ Cash\ Flow\ = Profit\ after\ Tax + Depreciation\ and\ Amortization\ -$
$Changes\ in\ Working\ Capital - Changes\ in\ Investments$

In the process of projecting cash flows, the anticipated cash flows for the years 2024 to 2028 are derived based on the Free Cash Flow (FCF) of 2023 and a consistent growth rate of 19%.
$Projected\ Cash\ Flow\ (Year\ N) = FCF(Year\ N - 1) * (1 + Growth\ Rate)$

The APV methodology leverages Discounted Cash Flow (DCF) principles to determine firm value, incorporating the present value of future tax benefits derived from debt financing. This multi-step process commences with the discounting of projected cash flows using the Capital Asset Pricing Model (CAPM)-derived Cost of Equity (COE) as the discount rate. Each year's projected cash flow (CF) is discounted according to the formula:

$$PV(CF_n) = \frac{CF(n)}{(1+COE)^n}$$

Where,

PV (CFn) = Present value of cash flow in year n CF(n) = Projected cash flow in year n
COE = Cost of equity n = Year
Simultaneously, the present value of tax shields (PVTS) arising from debt financing is calculated. Each year's tax shield (TS) is discounted utilizing the cost of debt (Kd) as the discount rate:

$$PVTS(n) = \frac{TS(n)}{(1+kd)^n}$$

Where,

PVTS(n) = Present value of tax shield in year n TS(n)= Tax shield in year n
Kd = Cost of debt n = Year

$Tax\ Shield = Interest\ Expense * Tax\ Rate$

The final step entails calculating the total firm value by aggregating the discounted cash flows and present values of tax shields across all years. This iterative process involves summing the discounted values for each year:

$Adjusted\ Present\ Value (APV) = \sum\{PV(CFn) +\ PVTS(n)\}$

Where,

APV = Integrated assessment of firm value Σ = Summation across all years

PV(CFn) = Present value of cash flow in year n PVTS(n) = Present value of tax shield in year n

Reliance Industries Limited (RIL)

Table 5: Statement of Free Cash Flow (in Cr.)

Particulars	2019	2020	2021	2022	2023
Profit after Tax	21493	23850	29285	34955	21493
Add: Depreciation and Amortization	10326	12934	14113	18668	10326
Cash Flow after Tax	31819	36784	43398	53623	31819
Less: Changes in Working Capital*	80690	44512	65405	(52162)	80690
Less: Changes in Investments	123667	79345	20286	(178688)	123667
Free Cash Flow	(172538)	(87073)	(42293)	284473	(172538)

Note: Working Capital = Current Assets – Current Liabilities

Changes in Working Capital = Working Capital (C.Y) – Working Capital (P.Y) Changes in Investment = Working Capital (C.Y) – Working Capital (P.Y)

Table 6: Valuation of the company through Projected Cash Flow (in Cr.)

Particulars	2024	2025	2026	2027	2028
Projected Cash Flow	74370.24	105315.697	177473.6944	355894.9581	849291.2359
Cost of equity	23%	22%	21%	25%	23%
Discounted Cash Flow	60463.60976	70757.6571	100179.2738	145774.5749	301669.279
PV of Tax Shield	-7263	-67553	-8079	-54614	-60146

$Total\ Value\ (APVr) =\ Discounted\ Cash\ Flow + PV\ of\ Tax\ \ Shield$

= 678844 + (197655)

= 481189

The Walt Disney Company (DIS)

Table 7: Statement of Free Cash Flow (in Cr.)

Particulars	2019	2020	2021	2022	2023
Profit after Tax	264202	(426189)	114236	145572	44849
Add: Depreciation and Amortization	582290	775530	741706	746846	773374
Cash Flow after Tax	846492	349341	855943	892419	818223
Less: Changes in Working Capital*	(1085990)	2955882	(820959)	(745271)	(283601)
Less: Changes in Investments	86382	34652	38631	(126505)	(25865)
Free Cash Flow	1846100	(2641194)	1638270	1764195	560487

Note: Conversion Rate: 1USD= ₹ 82.90

Table 8: Valuation of the company through Projected Cash Flow (in Cr.)

Particulars	2024	2025	2026	2027	2028
Projected Cash Flow	661374.542	920897.9123	1513064.739	2933496.265	6711128.834
Cost of equity	13%	11%	11%	17%	16%
Discounted Cash Flow	585287.2053	747421.4043	1106339.896	1565460.423	3195255.786
PV of Tax Shield	-23008	906	978	-95536	-12077

$Total\ Value\ (APVd) =\ Discounted\ Cash\ Flow + PV\ of\ Tax\ \ Shield$

= 7199765 + (128737)

= ₹ 7071028

INTERPRETATION
1. Comprehensive Valuation
APV considers operational assets and tax benefits, providing a comprehensive valuation of ₹481189 for RIL, while WAAC values the company at ₹7063151, ignoring tax benefits. Similarly, APV would likely yield a higher valuation for DIS, considering both operational assets and tax benefits, unlike WAAC, which only values the company at ₹(47838153)

2. Cash flow sensitivity
APV is more sensitive to changes in cash flows, reflecting RIL's varying cash flow patterns, resulting in a more accurate valuation. DIS's cash flow patterns would also be better captured by APV, given its high debt and varying cash flows, resulting in a more accurate valuation than WAAC.

CONCLUSION
When evaluating the components of financial structure, APV is more accurate as it considers tax benefits and non-operating items which have significant impact on the company's value. On the other hand, WAAC tends to produce higher values while overlooking certain components. APV helps the stakeholders make informed decisions and gain a clear understanding of a company's true worth.

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