**Question one**

**Trade-off Model**

**Introduction**

The trade-off model is examined in detail in this research, along with its theoretical foundations, essential elements and consequences for choosing the best as it is one of the most well-known and narrowly defined frameworks in corporate finance for assessing the ideal capital structure for a company is represented by trade-off theory. In order to identify the leverage ratio that optimizes its value, it weighs the advantages and disadvantages of various debt financing options (Myers, 2001.

**The Trade-Off Model**

The core assertion of this model is that firms optimize their capital structure by equating the marginal costs and marginal benefits of additional debt (DeAngelo & Masulis, 1980). Leverage ratios are determined by trading off the incremental tax benefits of more debt against the increasing financial distress and agency costs (Myers, 2001). The primary components of the model are:

* Tax benefits of debt: Interest expense on debt is tax deductible, creating valuable tax shields that lower a firm's corporate tax liability. Higher leverage provides greater interest tax deductions, constituting a major benefit of debt (Miller, 1977).
* Costs of financial distress: Excessive levels of debt amplify risk of default, producing deadweight bankruptcy and reorganization costs such as legal and administrative fees, disrupted operations, and loss of customers and revenue (Altman, 1984). This is a key cost of high leverage.
* Agency costs: Debt financing can instill beneficial governance incentives by necessitating cash flow for interest payments and reducing free cash flow for managerial excess. However it also incurs monitoring and bonding costs from the increased oversight of lenders (Jensen & Meckling, 1976). Managers may also reject positive NPV projects if rewards accrue mainly to debtholders.
* Non-debt tax shields: Other deductible expenses such as depreciation and amortization can substitute for the tax benefits of debt financing. This reduces the incremental gain from additional leverage (DeAngelo & Masulis, 1980).
* Static trade-off - The model assumes an optimal capital structure does exist for a given firm at a given time based on quantifiable cost-benefit trade-offs. Firms are viewed as moving towards this optimal leverage ratio (Myers, 2001).

**Theoretical Basis**

The trade-off theory is grounded in foundational corporate finance principles of valuation, risk analysis, and wealth maximization. The use of net present value analysis to quantify the marginal costs and benefits of incremental debt at various leverage points reflects the objective of maximizing firm value (Myers, 2001). Incorporating the notion of escalating financial risk and probability of distress with higher leverage integrates critical risk management considerations into the model.

The theory also combines and extends key insights from preceding theories of capital structure. The recognition of corporate tax benefits from debt financing builds on Modigliani and Miller's incorporation of taxes (1963). The analysis of agency costs and governance incentives integrates important contributions of agency theory (Jensen & Meckling, 1976). The trade-off perspective synthesis these ideas into a focused, economical model centered on valuations and risk. Firms are assumed to rationally weigh quantifiable factors to arrive at an optimal leverage ratio (DeAngelo & Masulis, 1980).

**Underlying Assumptions**

Several key assumptions underpin the trade-off theory:

**Capital markets are efficient and rational:** Investors accurately price securities based on risk and expected returns. No mispricing exists. This allows quantifying the costs of financial distress based on risk.

**Taxes and distress costs are the primary factors**: Agency issues and non-debt tax shields receive only minor consideration in basic trade-off analysis. This simplifies model inputs.

**Costs and benefits can be accurately quantified:** Firms are assumed able to reasonably estimate the marginal tax benefits and expected distress costs at varying levels of debt. This enables NPV analysis.

**Managers act rationally:** They logically evaluate the cost-benefit trade-offs and select the leverage ratio that maximizes firm value. Behavioral biases are ignored.

**Firm characteristics are relatively fixed:** Optimal leverage ratios are assessed based on current conditions. Major shifts in operations are not incorporated.

These assumptions allow a focused view of capital structure but also impose constraints relative to real-world complexities. Extensions to the model have aimed to relax simplifying assumptions.

**Implications for Optimal Capital Structure**

Through its focused theoretical lens, the trade-off model offers several reasoned insights regarding how firms determine optimal capital structure:

* Firms have a distinct optimal leverage ratio that equalizes marginal costs and benefits of additional debt. This focused perspective contrasts with capital structure irrelevance notions (Myers, 2001).
* The optimal leverage ratio varies across firms and industries based on factors like tax status, business risk, growth opportunities, and agency cost levels. There is no universal optimal debt ratio (DeAngelo & Masulis, 1980).
* Firms will purposefully rebalance back towards their optimal capital structure when substantially off it. Leverage ratios demonstrate mean reverting tendencies (Leary & Roberts, 2005).
* A firm's optimal capital structure exhibits reasonable stability over time rather than needing continuous rebalancing. But major operating changes can shift the optimum (Myers, 2001).
* Moderate leverage levels near industry norms are often optimal. Extremely high or low debt levels are seldom value maximizing (Frank & Goyal, 2009). The costs of deviating widely from peers generally outweigh benefits.

In summary, focused reasoning indicates firms rationally determine an optimal capital structure unique to their circumstances by trading off the costs and benefits of incremental debt. Firms then implement reasonable efforts to maintain leverage ratios near this optimum in order to maximize value.

**Empirical Evidence**

Considerable empirical research has aimed to test the core predictions of the trade-off theory:

**Leverage mean reversion:** Studies find mixed evidence. Some document reversion consistent with firms adjusting towards a target (Leary & Roberts, 2005). But others find excess leverage persists for many firms (Faulkender et al., 2012). This casts uncertainty on the adjustment process.

**Low leverage firms:** Trade-off theory indicates low leverage firms should benefit most from adding debt. But some studies find low leverage firms are reluctant to issue additional debt (Graham & Leary, 2011). This departure is not fully explained.

**U-shaped cost of debt:** The theory predicts a U-shaped cost of debt function reflecting increased risk. Empirical tests yield inconclusive results on the actual shape (Antoniou et al., 2008). Estimating costs of financial distress proves challenging.

In summary, empirical results provide some confirming evidence but also several inconsistencies. This suggests firms balance multiple factors beyond just taxes and distress costs in setting leverage. Extensions to the static trade-off model aim to improve explanatory power.

**Extensions and Modifications**

Recognizing its limitations, researchers have sought to improve the basic trade-off model with various extensions:

* Dynamic trade-off theory: Incorporates adjustment costs and market timing considerations to explain deviations from static optimum leverage ratios (Fischer et al., 1989).
* Contingent claims analysis: Uses option pricing models to value costs of financial distress rather than just probability of distress (Mauer & Triantis, 1994).
* Signaling incentive: Leverage can signal private information on firm quality and future prospects (Ross, 1977). This provides an additional rationale for debt policy.
* Macroeconomic conditions: Factors like growth opportunities and profitability influence optimal leverage and vary over the business cycle (Drobetz & Fix, 2005).

These extensions demonstrate capital structure determination in practice involves multiple dynamic factors beyond just static cost-benefit trade-offs. Integrating additional considerations provides a more comprehensive perspective.

**Contemporary Perspectives**

Leading scholars continue to view the basic trade-off theory as providing a useful foundational framework for gaining focused insights into capital structure choices:

* Myers (2001): The theory offers a focused, working understanding of debt policy centered on valuations and risk analysis. It captures major factors in leverage decisions.
* Graham & Leary (2011) - The model should not be rejected despite empirical inconsistencies. Its focused reasoning still informs capital structure research and practice.
* Parsons & Titman (2008) - Many deviations from static trade-off predictions represent reasonable, value-maximizing responses given market frictions.

In summary, contemporary experts underscore the focused insights the parsimonious trade-off model offers into the costs and benefits of leverage. Empirical limitations highlight capital structure determination is multifaceted, but the theory remains a valuable foundation. Ongoing efforts to augment trade-off analysis with additional factors aim to develop a truly comprehensive understanding.

**Conclusion**

The trade-off theory has provided one of the most prominent, focused frameworks for analyzing optimal capital structure over the past decades. It offers an economical perspective centered on balancing the costs and benefits of incremental debt to maximize firm value (Leary, 2005). The model provides focused, reasoned insights into capital structure choices and their implications. Empirical inconsistencies reveal real-world debt policy involves multiple complex factors. But contemporary experts concur the parsimonious trade-off model retains a vital foundational role in advancing capital structure understanding, especially when integrated with additional dynamic considerations.

**Question two**

**Introduction**

When debt and equity financing used by a firm to fund its operations and investments come together is known as capital structure. The leverage ratio has important implications for risk, returns and valuation. Consequently, determining an optimal capital structure is a critical financial decision for companies. This report undertakes a focused examination of key factors affecting capital structure choices. Relevant examples and contemporary research are synthesized to provide justified analysis.

**Profitability**

A firm's profitability significantly influences capital structure decisions. More profitable companies generally maintain lower leverage ratios (Frank & Goyal, 2009). This reflects considerations such as flexibility, signaling, and capacity to service debt. Highly profitable growth firms like Apple and Microsoft use minimal debt to preserve flexibility to fund emerging opportunities. Leverage can also signal information on profitability and risk, with lower debt signaling greater confidence in prospects (Ross, 1977). Furthermore, profitable firms are better positioned to service interest expenses from ample internal cash flow. Overall, greater profitability reduces reliance on external financing while also increasing debt capacity if needed.

**Non-Debt Tax Shields**

The existence of non-debt tax shields, such as depreciation and amortization, substitutes for the tax benefits of debt financing (DeAngelo & Masulis, 1980). For capital intensive firms like manufacturers, non-debt shields already reduce taxable income. This lowers the incremental tax advantage from issuing more debt. Companies will logically factor such shields into their leverage decisions. For example, airlines operate expensive assets eligible for large depreciation write-offs. This partly explains lower airline leverage ratios compared to other industries.

**Uniqueness of Assets**

Firms that rely heavily on unique, specialized assets tend to limit leverage. Unique assets cannot be easily redeployed if liquidation occurs, worsening downside outcomes in distress (Alderson & Betker, 1995). Their values also decline sharply in industry downturns when default correlation rises. For example, biotech firms depend on patents and proprietary R&D. Their constrained debt capacity protects specialized assets vulnerable in bankruptcy. Overall, asset uniqueness introduces downside risks that rationally discourage debt usage.

**Managerial Risk Aversion**

Highly risk averse managers are more inclined to limit their firm's leverage, everything else equal (Fama & French, 2002). Using less debt reduces default risk and volatility that managers find personally undesirable. Of course, this incentive conflicts with maximizing shareholder value if lower leverage sacrifices potential tax shields and governance benefits. Large family-run firms exhibit this tendency, like Walmart which could rationally operate with more leverage given massive steady cash flows. Overall, personal risk preferences of top executives can sway capital structure choices.

**Information Asymmetry**

Companies facing high information asymmetry between insiders and outsiders often limit leverage to avoid risks of credit rationing or mispricing (Myers & Majluf, 1984). When lenders lack full transparency into a borrower's financial strength and investment opportunities, they charge higher rates, issue shorter term debt, or limit funding. This raises the firm's costs of external financing and crimps profitable investments. For example, early stage biotech startups with intangible assets and unproven science rationally avoid high leverage despite tax incentives. Reducing information gaps through transparent disclosures can expand debt capacity.

**Conclusion**

In summary, capital structure analysis involves assessing multiple factors relating to taxes, risk, signaling, manager incentives, asset characteristics, and information transparency. Contemporary research confirms rational managers weigh these dimensions, often facing trade-offs between competing considerations (Antoniou, 2008). Profitability, non-debt tax shields, asset uniqueness, managerial risk aversion, and information asymmetry represent five key determinants thoroughly analyzed in current literature. Understanding these multifactorial drivers and their interdependencies allows deeper perspective on observed capital structures across various contexts.

**Question three**

**Introduction:**

Maria, an investor, is considering including ABC Ltd stock in her investment portfolio. ABC Ltd is a diversified manufacturer of pet products. In her analysis, Maria prioritizes the assessment of risk indicating a preference for stocks with a standard deviation below 10%.

**Data Overview:**

**2018:**

Beginning Price: £35.00

Ending Price: £36.50

Dividend Paid: £3.50

**2019:**

Beginning Price: £36.50

Ending Price: £34.50

Dividend Paid: £3.50

**2020:**

Beginning Price: £34.50

Ending Price: £35.00

Dividend Paid: £4.00

**Calculation of Average Return:**

**2018:**

Initial Investment: £35.00

Dividend Received: £3.50

Final Value: £36.50

Return = (Final Value - Initial Investment + Dividend)

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Initial Investment

= £ (36.50 - 35.00 + 3.50)

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£35.00

= £5.00

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£35.00

= 14.29%

**2019:**

Initial Investment: £36.50

Dividend Received: £3.50

Final Value: £34.50

Return = (Final Value - Initial Investment + Dividend)

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Initial Investment

= £ (34.50 - 36.50 + 3.50)

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£36.50

= £1.50

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£36.50

= 4.11%

**2020:**

Initial Investment was £34.50

Dividend Received: £4.00

Final Value: £35.00

Return = (Final Value - Initial Investment + Dividend)

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Initial Investment

= £ (35.00 - 34.50 + 4.00)

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£34.50

= £4.50

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£34.50

= 13.04%

**Average Return:**

= (14.29 + 4.11 + 13.04) / 3

= 31.44 / 3

**= 10.48%**

**Calculation of Standard Deviation:**

**Deviation from Average Return for the years accordingly:**

14.29 - 10.48 = 3.81%

4.11 - 10.48 = -6.37%

13.04 - 10.48 = 2.56%

**Squared Deviation:**

2018: (3.81) ^2 = 14.52

2019: (-6.37) ^2 = 40.59

2020: (2.56) ^2 = 6.55

**Sum of Squared Deviations:**

14.52 + 40.59 + 6.55 = 61.66

**Variance:**

Variance = Sum of Squared Deviations

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Number of Observations

Variance = 61.66

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3

**Variance = 20.55**

**Standard Deviation:**

Standard Deviation = √Variance

Standard Deviation = √20.55

**Standard Deviation ≈ 4.53%**

**Question four**

**Introduction**

The expected return and risk for individual stocks and portfolios is Capital Asset Pricing Model estimates (Sharpe, 1964).

This is as a result of investors wanting higher returns only for taking on non-diversifiable systematic risk which relates an asset's expected return. This measures how sensitive the returns are to shifts in the overall market (Sharpe, 1964). Two key ideas that emerge from it are the Security Market Line and the Capital Market Line.

The CAPM was groundbreaking in formally linking risk and return in a simple linear way. The model still offers useful intuition about risk and return tradeoffs while it relies on some assumptions. The CAPM's concepts continue to underpin more complex asset pricing models used today. So, while imperfect, it remains an elegant and foundational model in finance.

**The CAPM Model's explanation**

An asset's expected return is equal to its beta (systematic risk) times the risk-free rate plus a risk premium according to the model. In terms of math, it is stated as:

Beta (Market Return – Risk-Free Rate) + Risk-Free Rate equals Expected Return.

**Security Market Line (SML)**

The SML shows the relationship between an asset's beta and expected return through a graphical representation of the CAPM. The SML formula and the CAPM formula are the same. It is believed that assets above the SML are cheap and those below are overvalued. When managing a portfolio and making investment decisions (Drobetz, 2005).

**Capital Market Line**

This extends the concepts of the other two above to the entire market portfolio by plotting the risk-return combinations containing both the risk-free asset and the market portfolio. Investors can construct efficient portfolios by combining the two thereby offering the highest possible return for a given level of risk (Faulkender, 2012).

**Assumptions of the Model**

* **Perfect Capital Markets:** It is assumes that there are perfect capital markets which are devoid of all taxes, transaction fees and limitations on short sales. This supposition makes it easier to distinguish between systematic and unsystematic risk, which makes asset pricing analysis simple (Modigliani, 1963).
* **Homogeneous Expectations:** It assumes that all investors share the same expectations about future returns, standard deviations and covariances. This simplifying assumption enables the aggregation of individual demands into a market demand (Fischer, 1989).
* **Single-Period Holding Period:** It operates on the assumption of a single holding, neglecting the impact of multiple holding periods on asset returns. This aids in the formulation of a concise and manageable model but may not fully capture the complexities of long-term investment strategies (Frank, 2009).
* **Constant Risk Aversion:** It presupposes that investors exhibit constant levels of risk aversion. This assumption allows for the formation of a linear relationship between expected returns and beta.
* **No Borrowing or Lending Constraints:** This assumes that investors can borrow or lend money at the risk-free rate without any constraints. This facilitates the creation of a risk-free asset and simplifies the analysis of portfolio construction.

**Justification and contemporary perspective**

In the realm of financial theory, the assumptions underlying the CAPM model lay the groundwork for theoretical exploration.It is important to recognize the continuing discussion and criticism of these assumptions in the financial sector. The constraints and difficulties related to the assumptions of the CAPM have been clarified by recent studies (Graham, 2011).

An example is the idea of perfect capital markets has come under fire due to empirical data demonstrating transaction costs, taxes, and market frictions. Academics contend that the inclusion of these variables in the model may improve its application and relevance in real-world situations. The notion of uniform expectations has been called into question by behavioral finance findings that emphasize investors' varied capacities for information processing (Altman, 1984). Different expectations can be caused by individual biases and cognitive limitations, which can affect market dynamics and provide difficulties for the CAPM framework.

In conclusion even though the model has greatly advanced financial theory, its underlying presumptions demand careful consideration. Making educated decisions in the constantly changing financial landscape requires an understanding of the model's limits and an embrace of a more nuanced and practical approach.

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