Volkswagen group assignment

FINA2222

Group 40

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Question 1

a, Interest Tax Shield

New Debt (in million) = 7000$

PV(Int Tax Shields) in million $s = New Debt * Corporate tax rate = 7000 * 30% = 2100$

b, Effect of additional debt on the value of TPW and price per share

1. Pre-recapitalization

- New cash = 0
- Original market value of assets = 61 058$
- Interest tax shield for new debt (ITS) = 0
- Total market value of assets = New cash + Original market value of assets + ITS = 61058$
- Shares repurchased = na
- Number of shares outstanding = 501 295 263/1 000 000 = 501.30
- Stock price = E/Number of shares outstanding = 61 058/501.30 = 121.80$
- Market value of Equity (E) = Number of shares outstanding * Current share price = 501.30*121.80 = 61 058$
- Debt (D) = 0
- Total market value of assets = E+D = 61 058$

2. At announcement

- New cash = 0
- Original market value of assets = 61 058
- Interest tax shield for new debt (ITS) = 2100$
- Total market value of assets = New cash + Original market value of assets + ITS = 63 158$
- Shares repurchased = na
- Number of shares outstanding = 501 295 263/1 000 000 = 501.30
- Stock price = E/Number of shares outstanding = 63158/501.30 = 125.99
- Market value of Equity (E) = Total market value of asset – Debt = 63 158 – 0 = 63158$
- Debt (D) = 0
- Total market value of assets = 63 158$

3. Debt issuance

- New cash = 7000$ (borrowing)
- Original market value of assets = 61 058
- Interest tax shield for new debt (ITS) = 2100
- Total market value of assets = New cash + Original market value of assets + ITS = 70 158
- Shares repurchased = na

- Number of shares outstanding = 501.30
- Stock price = 63158/501.30 = 125.99
- Market value of Equity (E) = Total market value of asset – Debt = 70158-7000 = 63158
- Debt (D) = 7000
- Total market value of assets = 70158$

4. Post-recapitalization (Shares repurchase)

- New cash = 0
- Original market value of assets = 61 058$
- Interest tax shield for new debt (ITS) = 2100$
- Total market value of assets = New cash + Original market value of assets + ITS = 63 158$
- Shares repurchased = New debt/Stock price (Debt issuance) = 7000/125.99 = 55.56$
- Number of shares outstanding = Number of shares outstanding (Debt issuance) – shares repurchased = 501.30 – 55.56 = 445.73
- Stock price = E/Num. shares outstanding = 56158/445.73 = 125.99$
- Market value of Equity (E) = Total market value of asset – Debt = 63 158 – 7000 = 56 158
- Debt (D) = 7000
- Total market value of assets = 63 158

5. Post-recapitalization (Pay dividend)

- New cash = 0
- Original market value of assets = 61 058$
- Interest tax shield for new debt (ITS) = 2100
- Total market value of assets = New cash + Original market value of assets + ITS = 63 158$
- Shares repurchased = na
- Number of shares outstanding = 501.30
- Stock price = 56 158/501.30 = 112.03$
- Market value of Equity (E) = Total market value of asset – Debt = 63 158 – 7000 = 56 158
- Debt (D) = 7000
- Total market value of assets = 63 158$

Explanation: Using $7 billion of new debt for either share repurchase or paying a special dividend affects Volkswagen's share price and valuation differently. A Share Repurchase reduces the number of shares outstanding, increasing the earnings per share (EPS) and boosting the stock price due to the perceived confidence in the firm’s future performance. This reduction in share count, combined with stable market value, results in a higher per-share valuation. In contrast, in the Pay Dividend scenario, this action provides immediate cash to shareholders but does not alter the number of shares or improve long-term growth prospects. Consequently, while both strategies can enhance shareholder value in the

short term, a Share Repurchase generally has a more positive impact on the share price than a Pay Special Dividend case because it signals management's confidence and directly increases EPS.

Question 2

1. Pre-recapitalization

- Net Debt = Notes Payable + Current Port of Long term debt + total long term debt – Cash and short term investments = 121,073 + 109,188 – 87,174 = *143,087 mil*
- Market value of equity = 501,295,263/1 000 000 * 121.80 = *61,058 mil*
- Total Market value of Assets = 143,087 mil + 61,058 mil = *204,145*
- Net D/(Net D + E) = 143,087 mil / (143,087 mil + 61,058 mil) = *0.70*
- E/(Net D + E) = 61,058 / (143,087 mil +61,058 mil) = *0.299 round to 0.3*
- rE = rf + beta*risk premium = 2.7% + 1.13 * (7.5%) = *11.18%*
- rD = given at *4.3%* (applicable for both 3 cases)
- WACC pre tax (rU) = 0.3 * 11.18 + 4.3 * 0.7 = *6.36%*
- WACC = 0.3 * 11.18 + 4.3 * 0.7 * (1-corporate tax rate) = *5.45%*

2. Repurchase shares

- Net Debt = current Net debt + new borrowed debt = 143 087 + 7000 = *150,087*
- Market value of equity (E) = *56 158*
- Total Market value of Assets = 150 087 + 56 158 = *206 245*
- Net D/(Net D + E) = 150 087 mil / (150 087 mil + 56 158 mil) = *0.73*
- E/(Net D + E) = 56 158 / (150 087 mil +56 158 mil) = *0.27*
- rE = pretax WACC $rU_{pre\text{-}recapi}$ + Net Debt/E * (rU-rD) = 6.36 + 150 087/56 158 * (6.36-4.30) = *11.85%*
- WACC pre tax (rU) = 0.27 * 11.85% + 4.3% * 0.73 = *6.36%*
- WACC = 0.27 * 11.85% + 4.3% * 0.73 * (1-corporate tax rate) = *5.42%*

3. Pay special dividend

- Net Debt = current Net debt + new borrowed debt = 143 087 + 7000 = *150,087*
- Market value of equity = *56 158*
- Total Market value of Assets = 150 087 + 56 158 = *206 245*
- Net D/(Net D + E) = 150 087 mil / (150 087 mil + 56 158 mil) = *0.73*
- E/(Net D + E) = 56 158 / (150 087 mil +56 158 mil) = *0.27*
- rE = rU + Net Debt/E * (rU-rD) = 6.36 + 150 087/56 158 * (6.36-4.30) = *11.85%*
- WACC pre tax (rU) = 0.27 * 11.85% + 4.3% * 0.73 = *6.36%*
- WACC = 0.27 * 11.85% + 4.3% * 0.73 * (1-corporate tax rate) = *5.42%*

Explanation: Issuing $7 billion in new debt impacts Volkswagen's (VOLK) Weighted Average Cost of Capital (WACC) by increasing the proportion of debt in the capital structure. Before recapitalization, VOLK's WACC is 5.45%, with a debt-to-equity ratio of 0.70. After issuing the debt for a share repurchase, the WACC slightly decreases to 5.42%, as the cost of debt (4.3%) is lower than the cost of equity (11.85%) and benefits from the tax shield. This reduction in WACC reflects a lower hurdle rate for investments, making VOLK more attractive to investors. Conversely, using the debt to pay a special dividend also results in a WACC of 5.42%, but this does not contribute to future growth or increase earnings per share, making it a less effective strategy. While both scenarios lower the WACC from the original 5.45%, share repurchase is more beneficial as it reduces the number of shares, thereby boosting EPS and enhancing shareholder value.

Question 3

1. Before Recapitalization

MOST LIKELY (NORMAL):

- EBIT = Earnings before interest and income tax * 1.17 = 22576 * 1.17 = $26 414 million
- Interest expense = Debt * rD = 0 * 4.30% = 0 (applicable to 3 cases)
- Taxable income = EBIT – Interest expense = 26 414 - 0 = $26 414 million
- Taxes @ 30% = Taxable Income * 0.3 = 26414 * 0.3 = $7924 million
- Net Income = Taxable income – Taxes = 26 414 - 7924 = $18490 million
- Shares outstanding = No. of shares outstanding/1000000 = 501295263 / 1,000,000 = 501.30 (applicable to 3 cases)
- EPS = Net income / shares outstanding = 18490 / 501.30 = $36.88

WORST CASE:

- EBIT = Normal case EBIT * (1-0.7) = 26414 * 0.3 = $7924 million
- Taxable income = EBIT – Interest expense = 7924 - 0 = $7924 million
- Taxes @ 30% = Taxable Income * 0.3 = 7924 * 0.3 = $2377 million
- Net Income = Taxable income – Taxes = 7924 - 2377 = $5547 million
- EPS = Net income / shares outstanding = 5547 / 501.30 = $11.07

BEST CASE:

- EBIT = Normal case EBIT * 1.5 = 26414 * 1.5 = $39621 million
- Taxable income = EBIT – Interest expense = 39621 - 0 = $39621 million
- Taxes @ 30% = Taxable Income * 0.3 = 39621 * 0.3 = $11886 million
- Net Income = Taxable income – Taxes = 39621 - 11886 = $27735 million
- EPS = Net income / shares outstanding = 27735 / 501.30 = $55.33

2. After Recapitalization with share repurchase

MOST LIKELY (NORMAL):

- EBIT = Earnings before interest and income tax * 1.17 = 22576 * 1.17 = $26414 million
- Interest expense = New Debt * rD = 7000 * 4.30% = $301 million (applicable to 3 cases)
- Taxable income = EBIT – Interest expense = 26414 - 301 = $26113 million
- Taxes @ 30% = Taxable Income * 0.3 = $7834 million
- Net Income = Taxable income – Taxes = $18 279 million
- Share outstanding = Number of shares outstanding in 'Repurchase shares' scenario (in Q1) = 445.73$ (applicable in 3 cases)
- EPS = Net income / shares outstanding = 18 279/445.73 = 41.01

WORST CASE:

- EBIT = Normal case EBIT * (1-0.7) = 26414 * 0.3 = $7924 million
- Taxable income = EBIT – Interest expense = 7924 - 301 = $7623 million
- Taxes @ 30% = Taxable Income * 0.3 = $2287 million
- Net Income = Taxable income – Taxes = $5336 million
- EPS = Net income / shares outstanding = 5336/445.73 = 11.97

BEST CASE:

- EBIT = Normal case EBIT * 1.5 = 26414 * 1.5 = $39621 million
- Taxable income = EBIT – Interest expense = 39621 - 301 = $39320 million
- Taxes @ 30% = Taxable Income * 0.3 = 39320 * 0.3 = $11796 million
- Net Income = Taxable income – Taxes = $27 524 million
- EPS = 27 524/445.73 = 61.75$

3. After Recapitalization with dividend

MOST LIKELY (NORMAL):

- EBIT = Earnings before interest and income tax * 1.17 = 22576 * 1.17 = $26 414 million
- Interest expense = New Debt * rD = 7000 * 4.30% = $301 million (applicable to 3 cases)
- Taxable income = EBIT – Interest expense = 26414 - 301 = $26 113 million
- Taxes @ 30% = Taxable Income * 0.3 = $7834 million
- Net Income = Taxable income – Taxes = $18 279 million
- Share outstanding = 501295263 / 1,000,000 = 501.30 (applicable to 3 cases)
- EPS = Net income / shares outstanding = 18 279/501.30 = 36.46

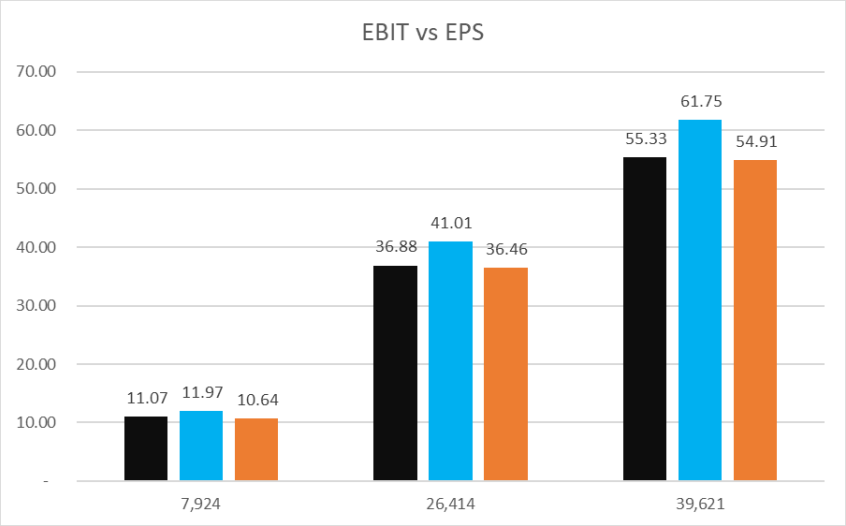
WORST CASE:

- EBIT = Normal case EBIT * (1-0.7) = 26414 * 0.3 = $7924 million
- Taxable income = EBIT – Interest expense = 7924 - 301 = $7623 million
- Taxes @ 30% = Taxable Income * 0.3 = $2287 million
- Net Income = Taxable income – Taxes = $5336 million
- EPS = Net income / shares outstanding = 5336/501.30 = 10.64

BEST CASE:

- EBIT = Normal case EBIT * 1.5 = 26414 * 1.5 = $39621 million
- Taxable income = EBIT – Interest expense = 39621 - 301 = $39320 million
- Taxes @ 30% = Taxable Income * 0.3 = 39320 * 0.3 = $11796 million
- Net Income = Taxable income – Taxes = $27 524 million
- EPS = 27 524/501.30= 54.91$

Graph:



Explanation:

In all 3 scenarios (before recapitalization, share repurchase, and paying dividends), the EBIT remains unchanged as recapitalization does not impact the operational earnings of Volkswagen (VOLK). However, the impact on EPS differs:

- **Share Repurchase:** This case results in the highest EPS because the company uses borrowed funds to repurchase shares, reducing the number of shares outstanding. With fewer shares in circulation, the same net income is distributed across a smaller base, thereby increasing EPS.
- **Paying Dividends:** This case results in the lowest EPS. Although the company borrows money, it does not use it to generate additional income or reduce the share count. Instead, the funds are used to pay dividends, which does not affect the share count, resulting in no EPS improvement.
- **Before Recapitalization:** The EPS in this case is in between because the company has no additional debt and therefore no changes in net income or share count, maintaining a relatively stable EPS.

Question 4

In the current competitive landscape, companies face several critical financial decisions. This essay discusses one such decision for VOWG, specifically concerning debt issuance and share repurchases. Several effects of this decision warrant attention. In this essay, we explore three key impacts: increased financial risk, debt overhang, and dilution.

1. Increased Financial risk

According to the research conducted on Volkswagen AG (VOWG), as of January 2024, more challenges are faced by Volkswagen concerning the automotive sector, and more specifically the market position and strategy of the company. Recapitalization introduces considerable financial risks, particularly with the addition of $7 billion in debt. Although this might result in a short-term increase in share prices, the latest Volkswagen case study (2024) reveals that the company faces significant competition in the EV market, and its market share in China is declining. A key concern is VOWG's capacity to manage higher debt repayments, especially when revenue sources are unpredictable, and competition intensifies.

Walker (1998) illustrates that whatever the phenomenon will be, the appreciation of stockholder wealth after the announcement of recapitalization is likely to be temporary. A recurrence of deterioration of the value of the companies in the post-recapitalization period is due to higher debt levels, demonstrating the reverse relationship between debt due to recapitalization and the value of stock relative to the level of leverage (p. 99). Due to VOWG's winning profit margin slowly eroding and the growing doubt in investors regarding its enormous spending on the transition to electric vehicles, the company could be highly susceptible to increased financial distress risk once a large debt beta is raised within the structure.

Volkswagen scored an ACSI® index measurement of 75 in 2023, which was a decline of three percent from ACSI® customer satisfaction achieved in the previous period. The said index is reported on a 100-score point scale, and the overall portfolio average for the mass market nameplate was 79, indicating a decline in consumer perception inducing financial risk.

2. Debt overhang

Debt overhang is when a company has so much debt that no new capital is supplied as the returns would go to debt holders instead of equity holders. In the case of Volkswagen AG (VOWG), a $ 7 billion leveraged recapitalization would mean sending the company stock to a highly competitive area which would add to its current level of leverage. In capital-intensive businesses like automotive, such binding ways of leveraging might reduce VOWG's resources to make appropriate purchasing on developments for all electric vehicles (EV) while they are losing market share in China, through stiff competition.

From the spreadsheet, VOWG's beta (1.13) means a higher-risk market since any additional debt might enhance this risk. A high amount of debt may also discourage more spending on future growth opportunities like R&D, and thus hamper growth in the long term.

3. Dilution

The repurchase of shares reduces the total shares available to the public, thus increasing the EPS, which can make the company more appealing to investors. However, this perceived advantage does not create fundamental value—it merely inflates the EPS (Dobbs & Rehm, 2005)

Regarding Volkswagen AG, it has been suggested there is scope for a leveraged recapitalization of $7 billion to borrow to repurchase shares or to pay a special shareholder dividend. Although the buyback does affect dilution by lowering total shares, it conveys to the market that the management has confidence in the prospects of the share and hence enhances the price. On the other hand, buybacks are market transactions that are done mainly to prevent the dilution of shares by reducing such shares.

Given Volkswagen's financial structure and the competitive environment, a buyback may enhance market value in the short term. However, without real operational changes, significant long-term benefits are unlikely. Buybacks will always depend on what Volkswagen finances and how the strategy will be executed.

In summary, while issuing debt to repurchase shares could have immediate benefits for VOWG in terms of reducing dilution, lowering WACC, and signalling confidence to the market, the long-term consequences, especially related to reduced financial risk and decreased flexibility must be carefully considered. Given the competitive pressures and high capital requirements in the automotive industry, the overall impact of these effects suggests that the decision to issue debt should be approached with caution.

References

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Appendix

All values are in millions except for share price and percentages

a. Interest tax shield

New debt (in million $s)	**7,000**
PV(Int Tax Shields) in million $s	2,100

b. Effect of additional debt on the value of TPW and price per share

				Two scenarios post-recapitalization	
	Pre-recapitalization	At announcement	Debt issuance	1. Repurchase shares	2. Pay special dividend
New cash	0	0	7,000	0	0
Original mkt value of assets (=	61,058	61,058	61,058	61,058	61,058
Interest tax shield (ITS) for nev	0	2,100	2,100	2,100	2,100
Total mkt value of assets	61,058	63,158	70,158	63,158	63,158
Shares repurchased	**na**	**na**	**na**	56	**na**
Num. shares outstanding	501.30	501.30	501.30	445.73	501.30
Stock Price	121.80	125.99	125.99	125.99	112.03
Mkt value of equity (E)	61,058	63,158	63,158	56,158	56,158
Debt (D)	0	0	7,000	7,000	7,000
Total mkt value of assets	61,058	63,158	70,158	63,158	63,158

Question 1 - Excel

All values are in millions except for share price and percentages

			Two scenarios post-recapitalization	
	Pre-recapitalization		1. Repurchase shares	2. Pay special dividend
Net Debt (D)	143,087		150,087	150,087
Mkt value of equity (E)	61,058		56,158	56,158
Total mkt value of assets	204,145	**BLANK**	206,245	206,245
Net D/(Net D+E)	0.70		0.73	0.73
E/(Net D+E)	0.30		0.27	0.27
rE	11.18%		11.85%	11.85%
rD	4.30%		4.30%	4.30%
pre-tax WACC (rU)	6.36%		6.36%	6.36%
WACC	5.45%		5.42%	5.42%

Question 2 – Excel

All values are in **millions** except for share price and percentages

Before Recapitalization

	Worst Case	Most Likely (normal)	Best Case
EBIT	**7,924**	**26,414**	**39,621**
Interest Expense	-	-	-
Taxable Income	7,924	26,414	39,621
Taxes (@30%)	2,377	7,924	11,886
Net Income	5,547	18,490	27,735
Shares Outstanding	501.30	501.30	501.30
EPS (Earnings Per Shar	**11.07**	**36.88**	**55.33**

Question 3 - Before Recapitalization

After Recapitalization with share repurchase			
	Worst Case	Most Likely (normal)	Best Case
EBIT	**7,924**	**26,414**	**39,621**
Interest Expense	301	301	301
Taxable Income	7,623	26,113	39,320
Taxes	2,287	7,834	11,796
Net Income	5,336	18,279	27,524
Shares Outstanding	445.73	445.73	445.73
EPS (Earnings Per Shar	**11.97**	**41.01**	**61.75**

Question 3 - After Recapitalization with Share repurchase

After Recapitalization with dividend			
	Worst Case	Most Likely (normal)	Best Case
EBIT	**7,924**	**26,414**	**39,621**
Interest Expense	301	301	301
Taxable Income	7,623	26,113	39,320
Taxes	2,287	7,834	11,796
Net Income	5,336	18,279	27,524
Shares Outstanding	501.30	501.30	501.30
EPS (Earnings Per Shar	**10.64**	**36.46**	**54.91**

Question 3 - After Recapitalization with Dividend