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Lindt & Sprüngli Sensitivity Analysis

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Abstract
In the context of Lindt & Sprüngli valuation a Sensitivity Analysis is presented to fully understand the impact of several variables namely the return on invested capital, weighted average cost of capital, risk free, market risk premium, capital structure, beta and terminal growth rate. This analysis was realized with the purpose of helping investors to make conscient decisions.

Keywords:
Sensitivity Analysis, Three Scenarios, Beta

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Mariana's Insight: Sensitivity Analysis

This insight aims to give a deeper perspective on how the different assumptions undertaken in the model affect the final share price as well as the investors decision towards the stock (buy, hold, sell). In this sence, a Sensativity Analysis was computed with the main purpose of determining the impact of one or more independent variables on a dependent variable (share price). The variables were analysed under 3 scenarios, the assumptions considered for the **base scenario** are explained in detail under the sections **4.1.1 Market Dimension** and **4.1.2 Market Share and Sales Analysis** of the report. The assumptions for both the **best and worst case-scenario** are described in the section **7. Scenario Analysis** of the report.

Initially the independent variables used were WACC and ROIC since they provide an aggreagated impact of several effects (beta, risk free, etc) on the final share price.

Table 1: Sensitivity Analysis using WACC and ROIC – Base Scenario

		Sensitivity Analysis terminal WACC				
	81929.6	**3.18%**	**3.28%**	**3.26%**	**3.48%**	**3.58%**
ROIC	**3.70%**	77595.5	72969.7	72969.7	65705.7	62802.9
	3.80%	81360.0	76392.9	76392.9	68593.0	65476.0
	3.90%	84931.5	79640.6	**79640.6**	71332.2	68012.1
	4.00%	88324.4	82725.9	82725.9	73934.4	70421.3
	4.10%	91551.7	85660.6	85660.6	76409.7	72713.0
	4.20%	94625.4	88455.7	88455.7	78767.2	74895.5

Source: Author elaboration

Considering the current values (**ROIC of 3.9%** and **WACC of 3.26%**) under the base (**Table 1**) and worst scenario the final output would be a hold. However, under the best scenario the output is a buy. As expected the value of the firm is maximized when the RONIC is maximized and the WACC is minimized. However to understand what variable impacts the WACC and the model the most a separate analysis of the variables was conducted in order to be more precise:

Cost of Equity: Market Risk Premium (MRP)

The MRP was computed by taking the proportion of Lindt's sales in each specific country as it is presented on **Table 2** and corresponds to **6.39%**.

Risk premium includes five main risks: **(1)** business risk, **(2)** financial risk, **(3)** liquidity risk, **(4)** exchange-rate risk, and **(5)** country risk. The last one, can be found on the column Damodaran ERP of Table 2.

Table 2: Market Risk Premium

CRP per country	Sales 2018	%	Damodaran ERP
USA	1,389.2	51.2%	6.0%
Canada	268.8	9.9%	6.0%
Australia	96.2	3.5%	6.1%
Japan	96.2	3.5%	6.1%
South Africa	96.2	3.5%	9.2%
China	96.2	3.5%	7.0%
Hong Kong	96.2	3.5%	6.4%
Brazil	96.2	3.5%	9.1%
Germany	574.9	21.2%	6.0%
Switzerland	392.1	14.4%	6.0%
France	364.9	13.4%	6.3%
Rest Of Europe	316.2	11.6%	6.7%
Italy	239.0	8.8%	8.6%
United Kingdom	191.1	7.0%	6.3%

Source: Author elaboration

The five types of risks vary with time and external events for eg. the impact of Brexit on the exchange rate of CHF/GBP that changed from 1.4459 in 2016 (before Brexit announcement) to an average of 1.27445 during 2018. This event impacts Lindt valuation since the UK represents 7% of Lindt's sales in 2018 (see section **3.2.1 Political factors** of the report for a detailed explanaition).

As we can see on **tables 3.1, 3.2 and 3.3** below an increase in MRP increases WACC and therefore diminishes the value of the firm. Under the 3 scenarios the expected MRP corresponds to **hold**. However it is relevant to notice that if the MRP is estimated through the MSCI World Index, corresponding to a value of 7.92% the recommendation would therefore be sell under the 3 scenarios. For this reason its important to consider possible volatility in this variable.

Table 3.1: MRP – Base Case

MRP	EV	Share Price	
5,77%	23961,4	105882,4	Buy
6,07%	20921,5	92311,4	Buy
6,39%	18623,6	82052,8	Hold
6,71%	16907,0	74389,3	Sell
7,04%	15517,8	68187,8	Sell

Table 3.2: MRP – Best Case

MRP	EV	Share Price	
5,77%	25658,1	113430,9	Buy
6,07%	21725,5	95874,7	Buy
6,39%	18944,5	83459,4	Hold
6,71%	16965,6	74625,4	Hold
7,04%	15422,2	67735,2	Sell

Table 3.3: MRP– Worst Case

MRP	EV	Share Price	
5,77%	22664,4	100135,0	Buy
6,07%	20213,7	89194,5	Hold
6,39%	18270,1	80517,8	Hold
6,71%	16763,6	73792,5	Sell
7,04%	15508,6	68189,8	Sell

Source: Author elaboration

Cost of Equity: Risk Free

For the risk free rate, the 10-year bond of the Swiss government was used since the valuation carried out in CHF, the current rate is (0.4)%. The fact that it is negative represents the overall instable

market conditions as well as investors willingness to buy safety. If this conditions change the risk free rate might as well change and the impact of possible changes is presented bellow on **tables 4.1, 4.2 and 4.3.** Under the current rate in the three scenarios the recommendation is **hold.**

Table 4.1: Rf – Base Case

Rf	EV	Share Price	
-0,60%	19656,3	86663,0	Hold
-0,40%	18596,0	81929,6	Hold
-0,20%	17679,3	77837,0	Hold
0,00%	16878,9	74263,8	Sell
0,20%	16174,1	71117,4	Sell

Table 4.2: Rf – Best Case

Rf	EV	Share Price	
-0,60%	20175,9	88956,7	Hold
-0,40%	18912,0	83314,5	Hold
-0,20%	17845,2	78551,8	Hold
0,00%	16932,7	74478,5	Sell
0,20%	16143,6	70955,4	Sell

Table 4.3: Rf – Worst Case

Rf	EV	Share Price	
-0,60%	19152,5	84457,1	Hold
-0,40%	18246,3	80411,4	Hold
-0,20%	17448,2	76848,5	Hold
0,00%	16740,1	73687,4	Sell
0,20%	16107,7	70864,0	Sell

Source: Author elaboration

All in all, a small change in the Rf rate does not seam to have a huge impact on the final share price (**Table 4**). However, if the Rf rate stops being negative the recommendation becomes sell. This happens since an increase in the rf rate not only makes equity more expensive but usually also increases the cost of debt.

Cost of Equity: Beta

To compute Lindt's beta two approaches were used: historical beta and comparable companies. We opted for the historical beta given the lack of truly comparable companies for Lindt as it is explained in detail under the section **4.2 WACC** of the report. The unlevered historical beta corresponds to 0.53 and the **levered beta to 0.55**. The analysis presented on **tables 5.1, 5.2 and 5.3** was computed using the levered beta and under the three scenarios the current value corresponds to a **hold.**

Table 5.1: Beta – Base Case

B	EV	Share Price	
0,37	-725956,3	-3241964,5	Sell
0,46	33527,9	148589,9	Buy
0,51	23750,3	104939,9	Buy
0,55	18964,1	83572,9	Hold
0,60	16128,4	70913,4	Sell

Table 5.2: Beta – Best Case

B	EV	Share Price	
0,37	-69036,3	-309312,0	Sell
0,46	40249,9	178573,0	Buy
0,51	25345,4	112034,8	Buy
0,55	19330,9	85184,5	Hold
0,60	16084,2	70690,4	Sell

Table 5.3: Beta – Worst Case

B	EV	Share Price	
0,37	129154,8	575538,6	Buy
0,46	29641,4	131282,6	Buy
0,51	22527,5	99524,1	Buy
0,55	18582,4	81912,1	Hold
0,60	16078,1	70732,0	Sell

Source: Author elaboration

Small difference in the leveraged beta have a huge impact in the share price, suggesting the model is very sensitive to changes in this variable. This is mainly caused by the capital structure of Lindt that has a debt portion of only 4% (D/(D+E)).

WACC: Capital Structure

Regarding optimal capital structure, we used Lindt's **historical D/E ratio of 0.04** and the reasons for it are explained in detail under **Gian's Insight in the Apendix.**

As well as in the beta analysis, a small variation in the capital structure also has a significant impact in the final share price, not being necessary a huge increase in the debt level for the analysis to change from an hold to a buy. This suggests that the firm might benefit from increasing the level of debt, meaning the firm has not yet reached the optimal debt level. Furthermore, under the three scenarios the current ratio represents a **hold.**

Table 6.1: D/E – Base Case

D/E	EV	Share Price	
0	17467,8	76892,9	Hold
0,04	18596,0	81929,6	Hold
0,08	19840,3	87484,5	Hold
0,12	21219,2	93640,4	Buy
0,16	22755,6	100499,4	Buy

Table 6.2: D/E – Best Case

D/E	EV	Share Price	
0	17603,3	77472,2	Hold
0,04	18912,0	83314,5	Hold
0,08	20397,2	89945,0	Hold
0,12	22097,0	97533,3	Buy
0,16	24061,0	106301,3	Buy

Table 6.3: D/E – Worst Case

D/E	EV	Share Price	
0	17260,9	76012,5	Hold
0,04	18246,3	80411,4	Hold
0,08	19309,5	85158,0	Hold
0,12	20460,1	90294,4	Hold
0,16	21708,9	95869,5	Buy

Source: Author elaboration

Terminal Value: Terminal Growth rate

The terminal growth rate expected has a value of **2.08%** and is used to discount the cash flows from the terminal period. The sensitivity analysis done in the **tables 7.1, 7.2 and 7.3** shows that changes in the growth rate don't have a relevant impact on the share price. This suggests that the value derived from the terminal period has less impact on the valuation that the forecasted period which is a positive result.

Table 7.1: G – Base Case

g	EV	Share price	
1.68%	18548.3	81716.8	Hold
1.87%	18571.1	81818.3	Hold
2.08%	18596.3	81931.1	Hold
2.29%	18621.6	82043.9	Hold
2.52%	18649.4	82168.0	Hold

Table 7.2: G – Best Case

g	EV	Share price	
1.68%	18842.6	83004.8	Hold
1.87%	18865.8	83108.4	Hold
2.08%	18891.6	83223.5	Hold
2.29%	18917.4	83338.7	Hold
2.52%	18945.8	83465.3	Hold

Table 7.3: G – Worst Case

g	EV	Share price	
1.68%	18219.8	80293.2	Hold
1.87%	18242.1	80392.5	Hold
2.08%	18266.8	80502.8	Hold
2.29%	18291.5	80613.1	Hold
2.52%	18318.6	80734.4	Hold

Source: Author elaboration

Key Takeaways

Overall, we can conclude that **WACC has a higher impact on Lindt's valuation than the terminal growth rate** and that the WACC's variable that seam to have a bigger impact on the model is the **Beta**. For this reason the final analysis presented on the section **6. Sensitivity Analysis** of the report instead of WACC is done with the Beta for a more precise output.

Table 8: Sensitivity Analysis using ROIC and Beta – Base Scenario

		Sensitivity Analysis Leveraged Beta				
	81929.6	**0.37**	**0.46**	**0.51**	**0.55**	**0.60**
ROIC	**3.70%**	-2758011.4	130523.6	93336.6	75133.3	64348.2
	3.80%	-2963462.0	138193.2	98262.5	78716.1	67135.3
	3.90%	-3241964.5	148589.9	104939.9	**83572.9**	70913.4
	4.00%	-3343545.6	152382.0	107375.4	85344.4	72291.4
	4.10%	-3519681.9	158957.3	111598.5	88416.0	74680.9
	4.20%	-3687430.8	165219.5	115620.4	91341.4	76956.5

Source: Author elaboration

Additionally, it is important to highlight that the impact of the variables has been considered individually considering everything else remains constant ("Ceteris Paribus") which is not always the case in real life and it's important to keep this in mind for decision making.