

Chp 6.

EQUITY VALUATION

WACC APV FTE

Equity Research

Masters in Finance

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CASE STUDY 2 (Extended to 2022F)

Balance Sheet

	2016	2017F	2018F	2019F	2020F	2021F	2022F
Goodwill	383	383	383	383	383	383	383
Intangibles	1,574	1,495	1,421	1,350	1,282	1,218	1,157
PP&E	3,123	3,360	3,400	3,390	3,391	3,403	3,424
Aircrafts & Engines	16,123	17,345	17,796	18,031	18,288	18,568	18,868
Spare parts	723	723	723	723	723	723	723
AFS	912	912	912	912	912	912	912
Inventories	562	564	672	694	724	773	831
Receivables	3,493	3,476	3,957	3,900	3,867	4,129	4,442
Deferred charges	172	197	235	243	253	271	291
Other assets	398	405	412	419	426	433	440
Financial Assets FV	2,283	2,283	2,283	2,283	2,283	2,283	2,283
Cash & Equiv.	1,231	905	1,971	2,898	3,495	4,309	5,930
ASSETS	30,977	32,048	34,163	35,224	36,027	37,404	39,685
EQUITY	9,222	9,731	12,004	13,791	15,234	17,001	19,517
Issued Capital	1,350	1,350	1,350	1,350	1,350	1,350	1,350
Reserves	6,891	7,294	7,457	8,831	10,619	12,061	13,829
Net profit/loss	981	1,087	3,197	3,610	3,265	3,590	4,338
LIABILITIES	21,755	22,317	22,160	21,433	20,794	20,403	20,168
Borrowings	9,983	10,768	9,691	8,722	7,850	7,065	6,358
Pension provisions	2,984	2,984	2,984	2,984	2,984	2,984	2,984
Other fin. Liabil.	734	746	759	772	785	799	812
Borrowings	1,613	1,563	1,513	1,463	1,413	1,363	1,313
Payables	4,723	4,511	5,441	5,693	5,935	6,338	6,817
Income Tax Oblig.	163	163	163	163	163	163	163
Other liabilities	1,555	1,581	1,608	1,636	1,663	1,692	1,721
EQUITY + LIABILIT.	30,977	32,048	34,163	35,224	36,027	37,404	39,685

CASE STUDY 2 (Extended to 2022F)

Income Statement

	2016	2017F	2018F	2019F	2020F	2021F	2022F
+Traffic rev. EU	16,812	16,075	19,417	20,621	21,297	22,154	23,213
+Traffic rev. ME&A	8,234	8,474	9,816	9,576	10,189	11,488	12,997
+Acilliary	3,283	3,646	4,353	4,518	4,703	5,002	5,359
-Fuel	(8,145)	(7,787)	(9,229)	(9,487)	(9,893)	(10,570)	(11,376)
-Staff	(6,516)	(6,652)	(6,792)	(6,935)	(7,406)	(7,762)	(8,111)
-Fees&Charges	(3,909)	(3,841)	(4,563)	(4,692)	(4,900)	(5,259)	(5,685)
-Maint&Repair	(2,346)	(2,316)	(2,287)	(2,259)	(2,231)	(2,203)	(2,175)
-Other Costs	(3,401)	(3,459)	(3,518)	(3,578)	(3,821)	(4,069)	(4,322)
=EBITDAR	4,013	4,140	7,197	7,765	7,940	8,781	9,899
-Rent Costs	(340)	(491)	(585)	(604)	(1,259)	(1,682)	(1,810)
=EBITDA	3,672	3,649	6,612	7,161	6,680	7,099	8,089
- D&A	(1,993)	(1,759)	(1,882)	(1,920)	(1,934)	(1,951)	(1,972)
= EBIT	1,679	1,890	4,730	5,241	4,747	5,148	6,117
- Interest	(396)	(441)	(467)	(428)	(393)	(361)	(333)
=EBT	1,283	1,450	4,263	4,813	4,353	4,787	5,784
- Taxes	(302)	(362)	(1,066)	(1,203)	(1,088)	(1,197)	(1,446)
= Net Income	981	1,087	3,197	3,610	3,265	3,590	4,338
	3.5%	3.9%	9.5%	10.4%	9.0%	9.3%	10.4%

CASE STUDY 2 (Extended to 2022F)

Cash Flow Statement

	2016	2017F	2018F	2019F	2020F	2021F	2022F
Operating Activities	3,246	3,084	5,870	6,257	5,847	5,998	6,752
+EBIT	1,679	1,890	4,730	5,241	4,747	5,148	6,117
+D&A	1,993	1,759	1,882	1,920	1,934	1,951	1,972
-Income Tax	(211)	(362)	(1,066)	(1,203)	(1,088)	(1,197)	(1,446)
-ΔNWC	(215)	(202)	324	299	255	95	110
Investment Activities	(2,107)	(3,139)	(2,298)	(2,073)	(2,125)	(2,178)	(2,233)
-CAPEX	(2,432)	(3,139)	(2,298)	(2,073)	(2,125)	(2,178)	(2,233)
+Other Inv.	325	0	0	0	0	0	0
Financing Activities	(1,158)	(271)	(2,506)	(3,257)	(3,125)	(3,006)	(2,898)
-Interest paid	(396)	(441)	(467)	(428)	(393)	(361)	(333)
-Dividends	(578)	(578)	(925)	(1,823)	(1,823)	(1,823)	(1,823)
-ΔDebt	(184)	747	(1,114)	(1,006)	(909)	(822)	(743)
Change in Cash	(19)	(326)	1,066	927	597	814	1,621
Begining	1,250	1,231	905	1,971	2,898	3,495	4,309
End	1,231	905	1,971	2,898	3,495	4,309	5,930

CASE STUDY 2 (Extended to 2022F)

Managerial Balance Sheet

	2016	2017F	2018F	2019F	2020F	2021F	2022F	
	0	1	2	3	4	5	6	Terminal
Fixed Assets & Others	22,838	24,218	24,635	24,788	24,979	25,207	25,467	
NWC	(1,816)	(1,614)	(1,937)	(2,236)	(2,492)	(2,587)	(2,696)	
Cash & Equiv. & Financial Assets	3,514	3,188	4,254	5,181	5,778	6,592	8,213	
Invested Capital	24,536	25,793	26,951	27,732	28,266	29,212	30,984	
EQUITY	9,222	9,731	12,004	13,791	15,234	17,001	19,517	
DEBT	15,314	16,061	14,947	13,941	13,032	12,210	11,467	
Capital Employed (E + D)	24,536	25,793	26,951	27,732	28,266	29,212	30,984	
% Equity	38%	38%	45%	50%	54%	58%	63%	60%
% Debt	62%	62%	55%	50%	46%	42%	37%	40%
Debt	15,314							
Cash & Equiv. & Financial Assets	3,514							
Net Debt	11,800							

CASE STUDY 2 (Extended to 2022F)

Compute the Free Cash Flow to the Firm (FCFF)

Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
	0	1	2	3	4	5	6
Incremental Earnings							
Revenues		28,196	33,586	34,715	36,190	38,643	41,568
Operating Expenses (+COGS)		(24,546)	(26,974)	(27,554)	(29,510)	(31,544)	(33,479)
EBITDA		3,649	6,612	7,161	6,680	7,099	8,089
D&A		(1,759)	(1,882)	(1,920)	(1,934)	(1,951)	(1,972)
EBIT		1,890	4,730	5,241	4,747	5,148	6,117
Income tax (25%)		(473)	(1,183)	(1,310)	(1,187)	(1,287)	(1,529)
Unlevered Net Income		1,418	3,548	3,931	3,560	3,861	4,588
Free Cash Flow							
+ D&A		1,759	1,882	1,920	1,934	1,951	1,972
- CAPEX		3,139	2,298	2,073	2,125	2,178	2,233
- ΔNWC		(202)	324	299	255	95	110
FCFF		240	2,808	3,478	3,113	3,539	4,217

WACC APPROACH

Constant Capital Structure – WACC

- Discount cash flows using the WACC rate

$$\beta_L = \beta_U \times \left[1 + \frac{D}{E} \times (1 - t) \right] = 0.90$$

$$r_e = \text{RFR} + \beta_i^{\text{mkt}}(\text{MRP}) + \text{IRP} = 9.40\% \quad (1)$$

RFR	1.0%	Rd	2.88%
β_U	0.60	Rd(1-t)	2.16%
β_L	0.90		
MRP	6.0%	Target	
IRP	3.0%	%E	60.0%
Tax rate	25.0%	%D	40.0%
Re	9.40%	WACC	6.50%

$$\text{WACC} = \frac{E}{V} \times r_e + \frac{D}{V} \times r_d \times (1 - T_c) = 6.50\%$$

- Compute the value of a levered firm

$$V_0^L = \sum \frac{FCFF_n}{(1 + wacc)^n}$$

(1) We are assuming an industry risk premium, as the CAPM may not capture other relevant risks

WACC APPROACH

Constant Capital Structure – WACC

- Discount cash flows using the WACC rate

Discount all cash flows considering the target capital structure

WACC rate = 6.50%

Assumes that Debt is a % of V_0^L – no data on current Debt outstanding.

Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
	0	1	2	3	4	5	6
Free Cash Flow		240	2,808	3,478	3,113	3,539	4,217
PV (FCF)	13,472	14,108	12,218	9,534	7,041	3,960	
V_L	13,472						
Debt	(5,389)						
Equity	8,083						

$$3,539 + \frac{4,217}{(1 + 0.065)^1}$$

$$(1 + 0.065)^1$$

$$V_0^L = \frac{240}{(1 + 0.065)^1} + \dots + \frac{4,217}{(1 + 0.065)^6}$$

$$Debt = \%D_{Target} \times V_0^L = 40\% \times 13,472$$

ADJUSTED PRESENT VALUE (APV) APPROACH

Constant Capital Structure - APV

- Discount cash flows using the R_u or pre-tax WACC

$$r_u = \frac{E}{V} \times r_e + \frac{D}{V} \times r_d = 6.79\%$$

RFR	1.0%	Rd	2.88%
β_U	0.60	Rd(1-t)	2.16%
β_L	0.90		
MRP	6.0%	Target	
IRP	3.0%	%E	60.0%
Tax rate	25.0%	%D	40.0%
Re	9.40%	WACC	6.50%
		R_u	6.79%

- Compute the value of an unlevered firm

$$V_0^U = \sum \frac{FCFF_n}{(1 + r_u)^n}$$

- Compute the value of a levered firm

$$V_0^L = V_0^U + PV(\text{Interest Tax Shield})$$

$$\pm PV(\text{Other Financing Side Effects})$$

ADJUSTED PRESENT VALUE (APV) APPROACH

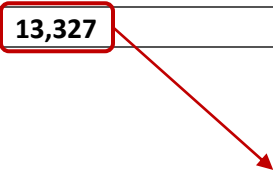
Constant Capital Structure - APV

- Discount cash flows using the r_u or pre-tax WACC

Discount all cash flows to obtain the unlevered value of the firm

$$r_u = 6.79\%$$

Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
	0	1	2	3	4	5	6
Free Cash Flow		240	2,808	3,478	3,113	3,539	4,217
V_u	13,327						


$$V_0^U = \frac{240}{(1 + 0.0679)^1} + \dots + \frac{4,217}{(1 + 0.0679)^6}$$

ADJUSTED PRESENT VALUE (APV) APPROACH

Constant Capital Structure - APV

- Compute the debt capacity as a % of V_0^L

Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
	0	1	2	3	4	5	6
Free Cash Flow		240	2,808	3,478	3,113	3,539	4,217
PV (FCF)	13,472	14,108	12,218	9,534	7,041	3,960	

Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
	0	1	2	3	4	5	6
Free Cash Flow		240	2,808	3,478	3,113	3,539	4,217
V u	13,327						
Debt Capacity	5,389	5,643	4,887	3,814	2,816	1,584	

Debt Capacity
= % $D_{Target} \times V_t^L$

Assumes a constant capital structure over the value of a levered firm in year t

ADJUSTED PRESENT VALUE (APV) APPROACH

Constant Capital Structure - APV

- **Compute the PV of the Interest Tax Shield**

Interest is on previous year outstanding debt

The interest rate may differ over time to account for the financial risk, although work with target figures

$$r_d = 2.88\% \text{ (current)}$$

Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
	0	1	2	3	4	5	6
Free Cash Flow		240	2,808	3,478	3,113	3,539	4,217
V_u	13,327						
Debt Capacity	5,389	5,643	4,887	3,814	2,816	1,584	
Interest paid		155	162	141	110	81	46
Tax shield		39	41	35	27	20	11
PV (tax shield)	144						
V_L	13,472						
Debt	(5,389)						
Equity	8,083						

→ using r_u

FLOW TO EQUITY (FTE)

Constant Capital Structure - FTE

- Compute the FCFE

Discount FCFE using equity cost of capital

$$r_e = 9.40\%$$

	Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
		0	1	2	3	4	5	6
FCFF			240	2,808	3,478	3,113	3,539	4,217
After tax interest (constant r_d)			116	122	105	82	61	34
Net Borrowing			255	(756)	(1,073)	(997)	(1,232)	(1,584)
Free Cash Flow to Equity			378	1,930	2,299	2,034	2,246	2,599
Equity		8,083						
Debt		(5,389)						
EV		13,472						

$$E_0 = \frac{378}{(1 + 0.0940)^1} + \dots + \frac{2,599}{(1 + 0.0940)^6}$$

WACC APV FTE

Main assumptions

- Valuing for a limited time period – not assuming the perpetual period
- Capital structure considered to be constant

In practice, collecting the same figures using the three methods is challenging.

Main challenges

- Several assumptions must be laid down to account for the specificities of each firm
- Debt levels may target some KPI (e.g., Net Debt / EBITDA)
- Assumptions for the Terminal Period shape our analysis
- Terminal growth rate for FTE may differ to consider the leverage effect

WACC vs APV: A DYNAMIC APPROACH TO VALUATION

Main assumptions

- Cost of capital is changing to account for the current capital structure

	2017F	2018F	2019F	2020F	2021F	2022F	
	1	2	3	4	5	6	Terminal
RFR	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
β_U	0.60	0.60	0.60	0.60	0.60	0.60	0.60
β	1.34	1.16	1.05	0.98	0.92	0.86	0.90
MRP	0.06	0.06	0.06	0.06	0.06	0.06	0.06
IRP	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Tax rate	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Re	12.06%	10.96%	10.33%	9.91%	9.54%	9.19%	9.40%
Rd	2.88%	2.91%	2.86%	2.82%	2.77%	2.73%	2.73%
Rd(1-t)	2.16%	2.18%	2.15%	2.12%	2.08%	2.04%	2.04%
%E	37.7%	44.5%	49.7%	53.9%	58.2%	63.0%	60.0%
%D	62.3%	55.5%	50.3%	46.1%	41.8%	37.0%	40.0%
WACC	5.89%	6.09%	6.22%	6.32%	6.42%	6.54%	6.46%
R u	6.34%	6.50%	6.58%	6.64%	6.71%	6.80%	6.73%

WACC vs APV: A DYNAMIC APPROACH TO VALUATION

Main assumptions

- Terminal period with a growth rate of 1.80% (normalizing period)

	2017F	2018F	2019F	2020F	2021F	2022F	2018-22	2021-22
Reinvestment Rate		2.61%	-3.71%	-1.80%	3.42%	3.30%	0.76%	
Net CAPEX		416	154	191	227	261		
ΔNWC		(324)	(299)	(255)	(95)	(110)		
EBIT (1-t)		3,548	3,931	3,560	3,861	4,588		
NI		3,197	3,610	3,265	3,590	4,338		
DIV		1,823	1,823	1,823	1,823	1,823		
Payout		57.0%	50.5%	55.8%	50.8%	42.0%	51.22%	
<i>g</i>		1.12%	-1.84%	-0.79%	1.68%	1.91%	0.37%	1.80%

See slides “Chpt. 6. Terminal Period”

WACC vs APV: A DYNAMIC APPROACH TO VALUATION

APV approach

- Debt capacity comes directly from the balance sheet
- Consider non-interest bearing financial assets (cash & cash equivalents)

	Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
		0	1	2	3	4	5	6
Free Cash Flow			240	2,808	3,478	3,113	3,539	4,217
V_u		77,732	77,492	79,598	81,289	83,523	85,530	87,053
Debt Capacity		15,314	16,061	14,947	13,941	13,032	12,210	11,467
Interest paid			441	462	430	401	375	351
Tax shield			110	116	108	100	94	88
Tax shield terminal								2,867
Tax shield total			110	116	108	100	94	2,955
PV (tax shield)		498					2,769	0
V_L		78,229						
Debt		(15,314)						
Cash		3,514						
Equity		66,429						

$$\frac{4,217 + 92,148}{(1 + 0.0654)^1}$$

$$\frac{4,217(1 + 0.018)}{0.0646 - 0.018}$$

WACC vs APV: A DYNAMIC APPROACH TO VALUATION

WACC approach

- Discount all cash flows using the WACC rate
- Remove the net debt at 2016YE
- Consider non-interest bearing financial assets (cash & cash equivalents)

	Year	2016	2017F	2018F	2019F	2020F	2021F	2022F
		0	1	2	3	4	5	6
Free Cash Flow			240	2,808	3,478	3,113	3,539	4,217
PV (FCF) - V_L		77,708	82,047	84,237	85,996	88,315	90,447	92,148
Debt		(15,314)						
Cash		3,514						
Equity		65,908						

$$\frac{4,217 + 92,148}{(1 + 0.0654)^1}$$

$$\frac{4,217(1 + 0.018)}{0.0646 - 0.018}$$

Equity Value (WACC Approach): €65.9 M

Equity Value (APV Approach): €66.4 M (+0.7%)