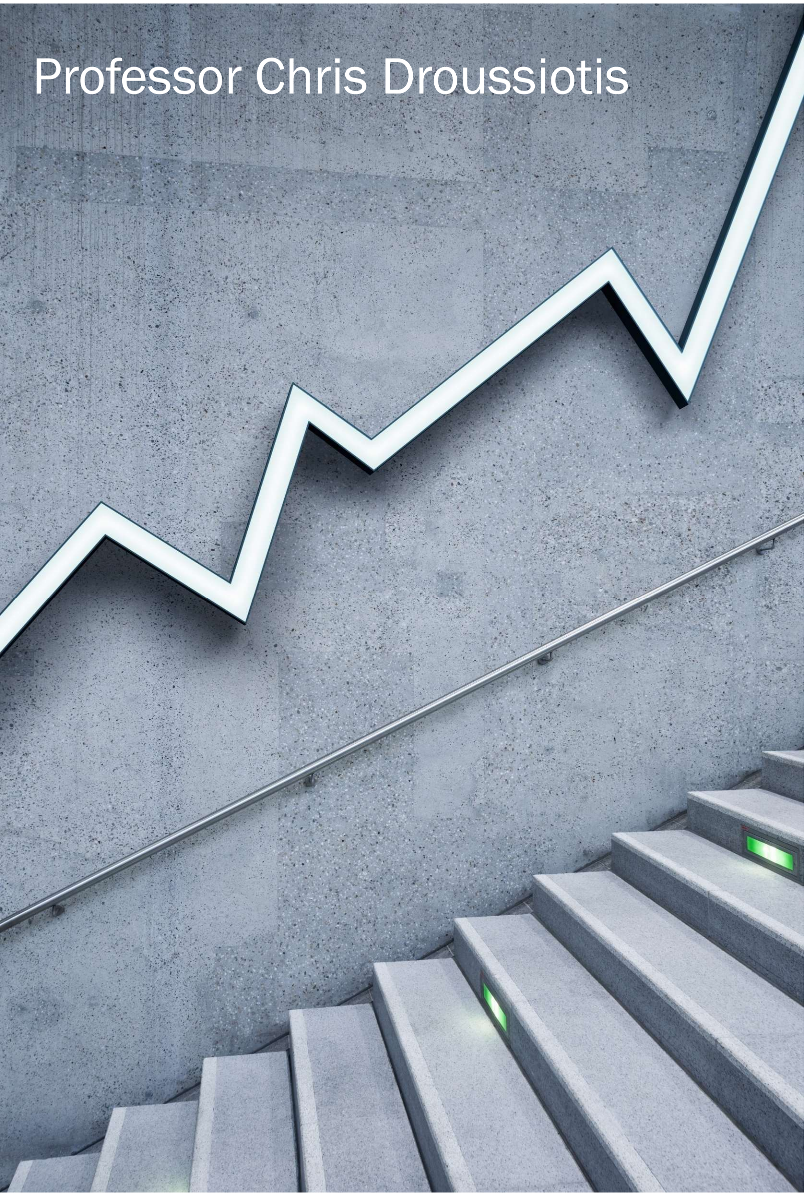

Mergers & Acquisitions

LECTURE 5: CORPORATE VALUATIONS

CASE STUDY 1: HYATT CORPORATION (PUBLIC TRADED COMPANY)

CASE STUDY 2: CELERITY TECHNOLOGY COMPANY (PRIVATE)

CASE STUDY 3: ABC AIR (DISTRESS COMPANY)

Valuation Analysis Overview

METHOD	DESCRIPTION	TYPE	TECHNICAL/ FUNDAMENTAL
1	Using the current stock price as a basis of valuation	Market	Technical
2	Intrinsic value and Capital Asset Pricing Model (CAPM)	Market	Technical
3	Dividend Discount Model (DDM)	Market	Technical
4	Comparable method using trading EBITDA multiples	Market	Fundamental
5	Comparable method using acquisition EBITDA multiples	Market	Fundamental
6	Discount cash flow method (DCF)	Income	Fundamental
7	Leveraged buyout private equity expectation model (LBO)	Income	Fundamental
8	Black-Scholes option pricing model	Options	Fundamental

Valuation of Publicly Traded Companies.

Testing the current Stock Price

Methods 1-6: Valuation of Public Traded Companies

Method 1: Using the Stock Price as the Basis of Valuation

- The formula to value the firm or the enterprise value (EV) is as follows:

$$EV = MVE + D - C$$

where EV is enterprise value, MVE is the market value of the equity, D is the total debt outstanding, and C is the cash and cash equivalents of the company.

- The stock price that represents the market value of each share when multiplied by the shares outstanding will give us the market value of the equity.

$$MVE = (SP \,.\, SO)$$

where MVE is the market value of the equity, SP is the stock price and SO is the shares outstanding.

Methods 1-6: Valuation of Public Traded Companies

Method 1: Using the Stock Price as the Basis of Valuation

Company	Symbol	Stock Price 2/4/2021	Stocks Outstanding ($000)	Equity Value ($000)	Debt (ST&LT) ($000) 9/30/2021	Cash ($000) 9/30/2021	Enterprise Value ($000)
Hyatt	H	$ 93.12	109,950	10,238,544	3,348,000	2,418,000	11,168,544

Methods 1-6: Valuation of Public Traded Companies

Method 2: Intrinsic Value and CAPM

The expected return is calculated by applying the capital asset pricing model (CAPM):

$E_r = Rf_r + \beta\ (M_r - Rf_r)$

where E_r is the expected return, Rf_r is the risk-free rate, β is the beta of the company that is analyzed, and M_r is market return.

The formula for today's intrinsic value is

$$v_0 = \frac{D_1 + \rho_1}{1 + k}$$

where D_1 is the dividend expected to receive within a year, P_1 is the expected stock price a year from now, and k is the discount rate or expected rate of return.

Methods 1-6: Valuation of Public Traded Companies

Method 2: Intrinsic Value and CAPM

METHOD #2- Intrinsic Value

Using CAPM = k = Rf + (Beta * Premium)		**Intrinsic Value = V0 = [E(D1) + E (P1)] / (1+k)**		
Risk Free =	1.90%	D1=	$1.76	Pre-covid
Beta =	1.48x			
Market Premium=	5.50%	Exp (P1)=	$96.00	(Avg Target by Analysts for 9/22)
Market Return (Rf + Premium)=	7.40%	k=	10.02%	
Expected Equity Return using CA	10.02%	Stock Val=	$ 88.85	

Methods 1-6: Valuation of Public Traded Companies

Method 3: Dividend Discount Model (DDM)

To calculate such value using the DDM method, the analyst needs the expected price of the stock a year from the date of the analysis, the expected dividend per share paid within the year, and a discount rate, which derived using the capital asset pricing model (CAPM).

- $$V = \frac{D1}{k-g}$$

where D_1 is the expected dividend, k is the discount rate, and g is the expected growth rate.

Traded Companies

Method 3: Dividend Discount Model (DDM)

METHOD #3- Dividend Discount Model (DDM)

Constant-Growth DDM (Gordon Model) V0 = D1 / (k-g)		**Expected HPR = E 9r) = [E (d1) + (E(p1) - P0) / P0**			
D1 =	$1.76	Dividend (d1)		$1.76	Pre-covid
Expected Equity Return (k)=	10.02%	P1 = P0+D		$94.88	
Expected Growth (g) =	**7.50%**	P0	$	93.12	
Stock Val =	**$ 74.95**	**Exp. HPR=**		**3.78%**	

Traded Companies

Method 5: Using Comparable Acquisition EBITDA Multiples

METHOD #5 - Using Averge EBITDA Transaction Multiples (M&A Comparable Method)

Target	Acquirer	Acquisition Price /Share	Shares Outstanding	Equity Value ($mm)	Total Net Debt ($mm)	Enterprise Value (EV)	EBITDA (last reported)	EBITDA Multiple
Extended Stay America	Blackstone Group	$ 19.50	177,560,000	$ 3,462	$ 2,303	$ 5,766	$ 356	16.18x
Starwood Hotels	Marriott Hotels	$ 72.08	154,000,000	$ 11,100	$ 1,090	$ 12,190	$ 980	12.44x
Hilton Hotels	Blackstone Group	$ 47.50	390,400,000	$ 18,544	$ 6,180	$ 24,724	$ 1,680	14.72x
Four Seasons*	Kingtom Hotels Int'l	$ 82.00	33,078,000	$ 2,712	$ 279	$ 2,991	$ 94	31.90x
Fairmont/Rafles	Kingtom Hotels Int'l	$ 45.00	73,335,000	$ 3,300	$ 124	$ 3,424	$ 187	18.29x
Hilton International	Hilton Hotels Corp.			$ 5,578	$ -	$ 5,578	$ 504	11.07x
Starwood Hotels	Host Marriott					$ 4,096	$ 315	13.00x
La-Quinta Corp	Blackstone Group	$ 12.22	203,000,000	$ 2,481	$ 926	$ 3,406	$ 230	14.83x
Wynham Int'l	Blackstone Group	$ 1.15	172,053,000	$ 198	$ 2,682	$ 2,880	$ 275	10.47x
John Q. Hammons Hotels	JQH Acquisition LLC	$ 24.00	19,583,000	$ 470	$ 765	$ 1,235	$ 123	10.04x
Societe du Louvre	Starwood Capital					$ 1,029	$ 91	11.30x
Intercontinental Hotels	LRG					$ 981	$ 107	9.20x
Boca Resorts	Blackstone Group	$ 24.00	40,284,000	$ 967	$ 217	$ 1,184	$ 90	13.15x
Prime Hospitality	Blackstone Group	$ 12.25	44,808,000	$ 549	$ 244	$ 792	$ 55	14.38x
Extended Stay	Blackstone Group	$ 19.93	95,077,000	$ 1,895	$ 1,232	$ 3,126	$ 225	13.90x
							Average	14.32x

Haytt's Enteprise Value 7,963,750 Stock Val= $ 63.97

Using 2019 EBITDA (Covid Adj)= 556,000

Method 6: DCF Valuation Analysis

To value the company using the DCF method the analyst needs to derive the following four items:

- Setting up a stream of cash flows
- Identifying an exit year
- Calculating the value at exit year (terminal value)
- Using the appropriate discount rate to value the present value of the firm

Method 6: DCF Valuation Analysis

	HISTORICAL										PROJECTED					
	Dec 31	Dec 31	Dec 31	Dec 31	Dec 31	Dec 31	Dec 31	Dec 31	Dec 31	Sep 31	Dec 31	Dec 31	Dec 31	Dec 31	Dec 31	Dec 31
($000's)	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Total Revenue	**3,949,000**	**4,184,000**	**4,415,000**	**4,328,000**	**4,429,000**	**4,685,000**	**4,454,000**	**5,020,000**	**2,066,000**	**2,376,000**	**2,685,800**	**3,357,250**	**4,028,700**	**4,633,005**	**5,096,306**	**5,605,936**
Revenue Growth		*6.0%*	*5.5%*	*-2.0%*	*2.3%*	*5.8%*	*-4.9%*	*12.7%*	*-58.8%*	*15.0%*	*13.0%*	*25.0%*	*20.0%*	*15.0%*	*10.0%*	*10.0%*
Cost of Revenue	3,121,000	3,283,000	3,433,000	3,377,000	3,473,000	3,638,000	3,475,000	4,077,000	2,067,000	2,155,000	2,435,984	2,637,895	3,165,474	3,640,295	4,004,324	4,404,757
Gross Profit	828,000	901,000	982,000	951,000	956,000	1,047,000	979,000	943,000	(1,000)	221,000	249,816	719,355	863,226	992,710	1,091,981	1,201,179
Gross profit	*21.0%*	*21.5%*	*22.2%*	*22.0%*	*21.6%*	*22.3%*	*22.0%*	*18.8%*	*0.0%*	*9.3%*	*9.3%*	*21.4%*	*21.4%*	*21.4%*	*21.4%*	*21.4%*
Total Operating Expenses	669,000	668,000	703,000	628,000	657,000	745,000	647,000	746,000	631,000	650,000	416,123	520,154	624,185	717,813	789,594	868,554
EBIT (Operating Income or Loss)	159,000	233,000	279,000	323,000	299,000	302,000	332,000	197,000	(632,000)	(429,000)	**(166,308)**	**199,201**	**239,041**	**274,897**	**302,387**	**332,626**
Interest Expense	70,000	65,000	71,000	68,000	76,000	80,000	76,000	75,000	128,000	164,000						
EBT & other Income/Expenses	89,000	168,000	208,000	255,000	223,000	222,000	256,000	122,000	(760,000)	(593,000)						
Other Income/Expenses Net	(6,000)	(153,000)	(317,000)	61,000	(66,000)	(351,000)	(695,000)	(884,000)	200,000	(467,000)						
EBT	(960,000)	1,006,000	951,000	573,000	289,000	573,000	951,000	321,000	(960,000)	(126,000)						
Income Tax Expense	8,000	116,000	179,000	70,000	85,000	323,000	182,000	240,000	(257,000)	270,000						
Net Income	(703,000)	766,000	769,000	250,000	204,000	250,000	769,000	205,000	(703,000)	(396,000)						
Depreciation	353,000	345,000	354,000	320,000	342,000	366,000	327,000	359,000	310,000	296,000	210,243	262,804	315,365	362,669	398,936	438,830
Working Capital	**(67,000)**	**(31,000)**	**24,000**	**25,000**	**(32,000)**	**126,000**	**(79,000)**	**(8,000)**	**(404,000)**	**241,000**	**(4,309)**	**(5,386)**	**(6,464)**	**(7,433)**	**(8,176)**	**(8,994)**
Capital Expenditure	(301,000)	(232,000)	(253,000)	(269,000)	(211,000)	(298,000)	(297,000)	(369,000)	(122,000)	(83,000)	(168,724)	(210,904)	(253,085)	(291,048)	(320,153)	(352,168)
Current Portion of Long Term Debt	-	-	-	-	-	-	-	11,000	260,000	10,000						
Long Term Debt	2,018,000	2,263,000	2,333,000	2,068,000	2,497,000	2,590,000	2,409,000	2,842,000	4,224,000	3,338,000						

Method 6: DCF Valuation Analysis

To value the company using the DCF method the analyst needs to derive the following four items:

- Using the appropriate discount rate to value the present value of the firm
  - WACC for Firm Value
  - CAPM for Equity Value

Cost of Equity Calc	
Risk Free Rate (5 year)	1.90%
Premium based on MC =	5.50%
Hyatt Beta =	1.48x
Expected Equity Return =	10.02%

WACC Calc	Amount	% Cap	RoR	AT RoR	WACC
Total Debt	3,348,000	24.6%	4.188%	3.27%	0.80%
MV Equity	10,238,544	75.4%	10.025%	10.02%	7.55%
	13,586,544	100.0%			8.36%

Interest Calculation	
Avg Debt	3,916,000
Interest	164,000
Rate	4.19%

Method 7: Using the Leveraged Buyout Model (LBO) Method

While the DCF analysis is used for determining today's value of the company based on future cash flows, the value of the company using this LBO method is determined based on investor expectation, which means return determines the acquisition price of the firm.

- Building the Transactions Sources and Uses
- Setting up the Debt Schedules
- Calculating the Expected Equity Return
- Running Projections
- Determining the Terminal Value
- Determining the Value of the Firm

Methods 1-6 - Summary:

Putting All the Values Together

ENTERPRISE VALUATION ANALYSIS								
	EV (000's)	Debt (000's)	Cash (000's)	Eq Value (000's)	Shares Outs (000's)	Stock Price	Recommend	(-10%/+10%)
METHOD #1 - Market Value / Using the Stock Pric	11,168,544	3,348,000	2,418,000	10,238,544	**109,950**	**$ 93.12**		
METHOD #2- Intrinsic Value	10,699,380	3,348,000	2,418,000	9,769,380	109,950	$ 88.85	Sell	-4.58%
METHOD #3- Dividend Discount Model (DDM)	9,170,235	3,348,000	2,418,000	8,240,235	109,950	$ 74.95	Sell	-19.52%
METHOD #4 -Average EBITDA Industry Trading M	10,912,445	3,348,000	2,418,000	9,982,445	109,950	$ 90.79	Sell	-2.50%
METHOD #5 - Using Averge EBITDA Transaction M	7,963,750	3,348,000	2,418,000	7,033,750	109,950	$ 63.97	Sell	-31.30%
METHOD #6 - Discount Cash Flow Valuation Analy	8,717,349	3,348,000	2,418,000	7,787,349	109,950	$ 70.83	Sell	-23.94%
Average of other methods	**9,492,632**			**8,562,632**		**$ 77.88**	Sell	-16.37%

Valuation of Private Companies

Applying methods 6-8

Method 6: Discount Cash Flow Method (DCF)

One of the most effective ways to value a private company is to dive into the company's projections and change the assumptions based on the investor's view of how the revenue will grow and at what cost.

Since there is no stock price that trades, which gives the investor a direct indication of what the company is worth (market value), an important method used by professionals is the discount cash flow (DCF) method, which measures the company's intrinsic value.

The conduction of this method is to calculate the first the equity cash flows, identify the exit year, estimate the terminal value in the exit year, and use the expected equity return as the discount rate.

Valuation Analysis – Celerity Technology Inc

Celerity Technogy Inc. ("CTI")
Discount Cash Flow Valuation Method (000's)

			PROJECTED			EXIT YEAR	
	Year -1	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues	960,000	1,110,000	1,228,140	1,344,200	1,442,919	1,529,268	1,605,161
Cost of Revenues	(345,000)	(420,000)	(463,078)	(506,823)	(544,053)	(576,709)	(605,474)
Operating Expenses	(230,000)	(257,000)	(271,501)	(289,448)	(306,442)	(322,900)	(338,999)
EBITDA	**385,000**	**433,000**	**493,561**	**547,928**	**592,424**	**629,659**	**660,688**
Less Depreciation & Amortization	(60,000)	(65,000)	(73,688)	(80,652)	(86,575)	(91,756)	(96,310)
EBIT	325,000	368,000	**419,872**	**467,276**	**505,849**	**537,902**	**564,378**
Less Taxes			(129,769)	(147,070)	(156,960)	(158,461)	(162,851)
EAT			**290,103**	**320,206**	**348,889**	**379,441**	**401,527**
Plus Depreciation & Amortization			73,688	80,652	86,575	91,756	96,310
Less Working Capital			2,870	(4,548)	(3,869)	(3,384)	(2,974)
Less Capital Expenditures and Investments			(193,626)	(211,923)	(227,487)	(241,101)	(253,066)
Cash Before Financing Payments			**173,036**	**184,386**	**204,109**	**226,713**	**241,796**
Less Debt Service (Principal + Interest)			(125,450)	(129,600)	(153,450)	(201,750)	(237,250)
Free Cash Flow			**47,586**	**54,786**	**50,659**	**24,963**	**4,546**
TERMINAL VALUE (TV)		**TV Assumptions**					
Terminal Value using EBITDA Multiple Method		EBITDA Multiple = **7.5x**				4,722,439	
Terminal Value using Perpetuity Method		Discount Rate = **10%**				4,835,926	
Average Terminal Value		Growth = **5%**				4,779,182	
Less Debt						(1,030,000)	
Equity Value at Exit Year						3,749,182	
Equity Cash Flows		Equity Expected Return = **20%**	47,586	54,786	50,659	3,774,145	
Present Value of Equity		1,927,111	39,655	38,046	29,316	1,820,093	
Plus Debt		1,190,000					
Less Cash		(65,800)					
Firm Enterprise value		**3,051,311**					
Enteprise Value / EBITDA		7.0x					

Figure 17.10

Method 7: Leveraged Buyout (LBO) Method for Private Companies

Celerity Technogy Inc. ("CTI")
LBO Method (000's)

TRANSACTION SOURCES & USES

Sources	Capacity EBITDA x	Amount	% Capital	Inter. / Exp. Ret.	WACC	Uses		Purchase EBITDA Multiple	Amount
Bank Loan	3.5x	1,515,500	33.8%	5.0%	1.1%	Purchase Enteprise Value		10.0x	4,330,000
Corporate Bonds	2.5x	1,082,500	24.2%	8.0%	1.2%	Fees (% EV)	3.50%		151,550
Total Debt	6.0x	2,598,000	58.0%		0.0%				
Equity		1,883,550	42.0%	25.0%	10.5%				
Total Sources		4,481,550	100.0%		10.5%				4,481,550

Tax Rate = 36%

DEBT SCHEDULES

	Years	Interest	Year 0	Year 1	Year 2	Year 3	EXIT YEAR Year 4	Year 5
Bank Loal - Outstanding	5	5.0%	1,515,500	1,363,950	1,212,400	1,060,850	909,300	-
Bank Loan - Principal Incr./Decr.				151,550	151,550	151,550	151,550	909,300
Bank Loan - Interst Payment				75,775	68,198	60,620	53,043	45,465
Bonds - Outstanding	10	8.0%	1,082,500	1,082,500	1,082,500	1,082,500	1,082,500	1,082,500
Bonds - Principal Incr./Decr.				-	-	-	-	-
Bonds - Interst Payment				86,600	86,600	86,600	86,600	86,600

CASH FLOW PROJECTIONS

	Year -1	Year 0	Year 1	Year 2	Year 3	EXIT YEAR Year 4	Year 5
Revenues	960,000	1,110,000	1,228,140	1,344,200	1,442,919	1,529,268	1,605,161
Cost of Revenues	(345,000)	(420,000)	(463,078)	(506,823)	(544,053)	(576,709)	(605,474)
Operating Expenses	(230,000)	(257,000)	(271,501)	(289,448)	(306,442)	(322,900)	(338,999)
EBITDA	**385,000**	**433,000**	**493,561**	**547,928**	**592,424**	**629,659**	**660,688**
Less Depreciation	(60,000)	(65,000)	(73,688)	(80,652)	(86,575)	(91,756)	(96,310)
Less Amortization			(30,310)	(30,310)	(30,310)	(30,310)	(30,310)
EBIT	325,000	368,000	**389,562**	**436,966**	**475,539**	**507,592**	**534,068**
Less Taxes			(140,242)	(157,308)	(171,194)	(182,733)	(192,265)
EAT			**249,320**	**279,658**	**304,345**	**324,859**	**341,804**
Plus Depreciation & Amortization			103,998	110,962	116,885	122,066	126,620
Less Working Capital			2,870	(4,548)	(3,869)	(3,384)	(2,974)
Less Capital Expenditures and Investments			(193,626)	(211,923)	(227,487)	(241,101)	(253,066)
Cash Before Financing Payments			**162,563**	**174,149**	**189,874**	**202,441**	**212,383**
Less Debt Service (Principal + Interest)			(125,450)	(129,600)	(153,450)	(201,750)	(237,250)
Free Cash Flow			**37,113**	**44,549**	**36,424**	**691**	**(24,867)**

TERMINAL VALUE (TV)	**TV Assumptions**		Year 1	Year 2	Year 3	Year 4
Terminal Value using EBITDA Multiple Method	EBITDA Multiple =	**10.0x**				6,296,585
Terminal Value using Perpetuity Method	Discount Rate =	**10.5%**				3,856,429
Average Terminal Value	Growth =	**5.0%**				5,076,507
Less Debt						(1,030,000)
Equity Value at Exit Year						4,046,507
Equity Cash Flows	Equity Expected Return =	**25%**	37,113	44,549	36,424	4,047,197
Present Value of Equity	1,734,583		29,690	28,511	18,649	1,657,732
Plus Debt	2,598,000					
Less Cash	-					
Firm Enterprise value	**4,332,583**					
Enteprise Value / EBITDA	10.0x					

Figure 17.11

Method 8: Valuation of Distress Firms

Option Pricing Model Framework

- In option pricing and specifically in call options the payoff formula or intrinsic value of the option is

---

Option payoff = Max (0, S – X)

where S is the stock price and X is the exercise price.

- To calculate the enterprise value

EV = E + D – C or EV = E + net D

where EV is the enterprise value of the firm, E is the equity value, D is the debt and C is cash. The net D is referred to as debt minus cash implied that the current debt could be paid with cash on hand.

- Solving for equity:

E = EV – net D

where E is the equity, EV is the enterprise value and net D is the net debt.

Method 8: Valuation of Distress Firms

Option Pricing Model Framework

The Black-Scholes formula is

$$\mathbf{C\ option\ payoff} = \mathbf{S}e^{-\delta.t}\,.\,\mathbf{N}\,(d1) - \mathbf{X}e^{-\mathrm{i}.t}.\,\mathbf{N}\,(\mathbf{d2})$$

where S is the stock price, δ is the dividend yield, t is time until expiration, X is the option exercise price, i is the risk-free interest rate, and N is the normal distribution.

$$\mathbf{d1} = \frac{\left[\ln\left(\frac{S}{X}\right) + \left(i - \delta + \frac{\sigma^2}{2}\right).t\right]}{\sigma\sqrt{t}} \quad \textit{and} \quad \mathbf{d2} = \mathbf{d1} - \sigma\sqrt{t}$$

where S is the current stock price, X is the contractual exercise price, i is the risk-free interest rate, δ is the dividend yield, σ is the standard deviation, and t is time to expiration.

Method 8: Valuation of Distress Firms

Input:

- S = Value of the firm = \$1 billion
- X = Exercise price = debt value = \$1,200 million
- σ = Standard deviation of the asset = 20%
- t = Time = term of the bond = 5 years
- i = Risk-free rate = 3%
- δ = Dividends = cash flow paying the equity = \$0
- C = Equity value = E =?

Formulas and output:

Using the formula to determine the deviations d1 and d2:

$$\boldsymbol{d1 = \frac{\left[ln\left(\frac{S}{X}\right)+\left(i-\delta+\frac{\sigma^2}{2}\right).t\right]}{\sigma\sqrt{t}}} \text{ and } \boldsymbol{d2 = d1 - \sigma\sqrt{t}}$$

$d1 = .7671 \text{ and } N(d1) = .7785$

$d2 = .5678 \text{ and } N(d2) = .7149$

Using the Black Sholes formula:

$$C = Se^{-\delta.t} . N\,(d1) - Xe^{-i.t} . N\,(d2)$$

$$C = \$152.0\ million$$

Valuation Analysis of Distress Company – AB Air Co.

AB Air Co., an airline company that entered bankruptcy in 1990. At the time of the filing, the debt outstanding, representing the exercise price X, was at $600 million with a remaining life or duration of 5 years. To establish the value of equity, the enterprise value needs to be calculated. The management put together a business plan including 5 years of projections. In the first year, the company is planning to spend more money, representing restructuring costs and downsizing. Based on the 5 years' projection, the equity analyst could calculate the present value of the future cash flows, an estimated terminal value, and an assumed discount rate using the weighted average cost of capital of 10.5%.

- The DCF analysis yields an enterprise value or the value of S of $934 million. Obviously with S = $934 million and X = $600 million the equity is in the money. Using the Black-Scholes option pricing model the equity or the call option C is calculated at $575 million after taking into consideration the combined variance for both debt and equity using the following formula:

$$\sigma sb^2 = s^2 . \sigma s^2 + b^2 . \sigma b^2 + 2\ (Ws . Wb . \sigma s . \sigma b) . \rho$$

where σsb^2 is the combined variance of bonds and stocks, Ws is the percentage of stocks to total capitalization, σs^2 is the stock price variance prior to bankruptcy, Wb is the bond outstanding as percentage of total capitalization, σb^2 is the bond price variance prior to bankruptcy, and ρ is the correlation between the stock and bond prices.

– AB Air Co.

CASE STUDY: AB Air Co.

File for Bankruptcy 1990

DEBT ASSUMPTIONS			VALUE ASSUMPTIONS (Pre-bankrupcy)	
Debt Outstanding =	600		Stock Montly Var. (1985 - 1990) =	3.15%
Weighted Average Duration=	5	years	Bonds Monthly Var. (1985 - 1990) =	2.16%
Weighted Average maturity=	8.7	years	Correlation between Stock/Bond	0.25
WACC=	10.0%		Debt proportion (1987 - 1991) =	88.30%
Tax Rate =	36.0%			

Discount Cash Flow Analysis ($ millions)		1991	1992	1993	1994	1995
Revenue		1,250.0	1,137.5	1,114.8	1,159.3	1,205.7
CoGS		(980.0)	(810.0)	(668.0)	(695.6)	(723.4)
Oper. Exp.		(720.0)	(210.0)	(205.8)	(214.0)	(222.6)
EBIT		**(450.0)**	**117.5**	**241.0**	**249.7**	**259.7**
EBIT (t)		**(162.0)**	**42.3**	**86.8**	**89.9**	**93.5**
EBIT (i-t)		**(288.0)**	**75.2**	**154.2**	**159.8**	**166.2**
Less Maintenance Capex (offset by Depreciation)		-	-	-	-	-
Less W/C (assumiung $0)		-	-	-	-	-
Cash Flow		(288.0)	75.2	154.2	159.8	166.2
Terminal Value assumption	5.0x EBIT					1,298.5
EV (PV) of the firm	**$934.8**	**(288.0)**	**75.2**	**154.2**	**159.8**	**1,464.7**

Step 1 - Find the annualized in stock and bond prices:

Annualized Variance in Stock Price σ^2 =	0.37812	(annual)	St. Dev.=	0.6149146
Annualized Variance in Bond Price σ^2 =	0.2592	(annual)	St. Dev.=	0.5091169

Step 2 - Find the annualized variance in firm value

(we^2 x σe^2) + (wb^2 x σb^2) + 2. (we x wd x ped x σe x σd). C

We=	11.70%	C=	0.25
Wd=	88.30%		

Annualized Variance in firm value 0.211314

The five-year bond rate (corresponding to the weighted average duration of 5.1 years) is 6.0%

Stet 3 - Find the value of call based upon the following parameters of equity as a call option

Value of the underlying asset = S = Value of the firm =	$934.8	
Exercise Price = X = Face Value of outstanding debt =	$600.0	
Life of the option = t = Weighted average duration of debt=	5	years
Variance in the value of the underlying asset = σ^2 =	0.2113143	
Riskless Rate = I = T-Bond for option life =	6.00%	

d1=	1.23721	N (d1) =	0.8919954
d2=	0.209313	N (d2) =	0.5828981

Value of the call (Equity) = 574.5364

Figure 17.12