Estimate of the Fair Value of Deal Equity & Options

as of June 30, 2017

Prepared for Techco

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by

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Draft

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Techco
Estimate of the Fair Value of Deal Equity & Options
Executive Summary

(1) **Valuation Results**

Fair Value of the Equity	**$178,090,547**
Fair value of the Forfeiture option	**-$7,787**

Footnote(s):

(1) Refer to Exhibits 2 to 4.

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Estimate of the Fair Value of Deal Equity & Options
Assignment and Methodology

Assignment

On June 30, 2017 Techco and Cashco entered into a joint venture (JV). Techco agreed to provide intellectual property in exchange for 40% of the equity of the JV.
Cashco agreed to invest $75 million initially and then to add $50 million on the anniversary of the agreement each year for 4 years in exchange for 60% of the equity of the JV.
Cashco also received the right to cease payments at any time and to thereby forfeit its ownership in the JV.
We have been asked to calculate the fair value Techco's share of the equity as of June 30, 2017 and the value of Cashco's forfeiture options.

Methodology

We concluded that the best way to calculate the values requested, especially the value of the forfeiture options would be to use an option pricing approach.
Based on discussions with Management, we determined that the initial value of the equity of the JV would be $75 million plus the value of Techco's intellectual property and, the value of equity would increase by $50 million each time Cashco made a subsequent contribution. At each future anniversary Cashco would have to decide whether to forfeit its equity. That decision is path-dependent and along with the addition of future equity required that we implement the option pricing through a Monte Carlo simulation. The attached paper by Grant, Vora and Weeks describes how we implemented the backward recursive decision to forfeit in the Montee Carlo simulation. At each date we found, using a maximization logarithm, the threshold value of equity below which it was optimal for Cashco to forfeit its equity.


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Business Materials\

Footnote(s):

[1] Dwight Grant, Gautam Vora and David Weeks, “Simulation and the Early-Exercise Option Problem”, The Journal of Financial Engineering, Volume 5, Number 3, pp. 211-227.

Buyco
Estimate of the Fair Value of an Earnout
Valuation

Valuation	
(1) Initial cash investment	$75,000,000
(1) Conditional cash investment after one year	$50,000,000
(1) Conditional cash investment after two years	$50,000,000
(1) Conditional cash investment after three years	$50,000,000
(1) Conditional cash investment after four years	$50,000,000
(2) Risk-free rate	1.60%
(3) Annual equity volatilty	35%
(4) Probability of making investment after one year	-99.99%
(4) Probability of making investment after two years	-99.97%
(4) Probability of making investment after three years	-99.96%
(4) Probability of making investment after four years	-99.96%
(5) Initial value of equity	$253,090,547
(1) Value of Cashco's initial contribution	$75,000,000
(6) Value of Techco's contribution	$178,090,547
(7) Expected present value of Cashco's future contributions	$192,134,716
(7) Expected present value of Cashco's total contributions	$267,134,716
	$7,787

Monte Carlo Simulation of the Value of Cashco's Equity after Investment or Forfeiture (in thousands)

	2018		2019		2020		2021	
Iteration	Equity	Investment	Equity	Investment	Equity	Investment	Equity	Investment
1	$286,538	$50,000	$291,484	$50,000	$363,078	$50,000	$272,535	$50,000
2	$534,798	$50,000	$677,451	$50,000	$701,295	$50,000	$659,877	$50,000
3	$294,786	$50,000	$521,252	$50,000	$464,907	$50,000	$161,818	$50,000
4	$271,881	$50,000	$275,920	$50,000	$507,669	$50,000	$225,012	$50,000
5	$182,586	$50,000	$0	$0	$0	$0	$0	$0
6	$412,865	$50,000	$627,485	$50,000	$678,639	$50,000	$421,041	$50,000
7	$483,176	$50,000	$321,914	$50,000	$284,728	$50,000	$201,898	$50,000
8	$381,256	$50,000	$385,055	$50,000	$317,812	$50,000	$233,411	$50,000
9	$280,411	$50,000	$293,658	$50,000	$557,728	$50,000	$398,035	$50,000
...	...	...	...	...	...	...	...	...
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...	...	...	...	...	...	...	...	...
99,996	$258,544	$50,000	$135,111	$50,000	$0	$0	$0	$0
99,997	$267,745	$50,000	$445,327	$50,000	$437,290	$50,000	$251,851	$50,000
99,998	$260,700	$50,000	$287,885	$50,000	$219,950	$50,000	$143,794	$50,000
99,999	$192,063	$50,000	$387,046	$50,000	$382,196	$50,000	$186,283	$50,000
100,000	$320,556	$50,000	$405,410	$50,000	$233,898	$50,000	$160,101	$50,000

Footnote(s):

(1) Based on the Agreement.
(2) US Constant Maturity Treasury Rates as obtained from S&P Capital IQ.
(3) Refer to Exhibit 4.
(4) Output of the simulation based on the frequency of default at each date.
(5) Backsolved in the simulation such that the present value of what Cashco receives, net of the future investments of $50 million is equal to $75 million.
(6) The difference between the value of initial equity and Cashco's contribution of $75 million.
(7) This is the present value of future cash contributions weighted by their probabilities as found in the simulation. Note that the totsl present value of equity including futrue contributions is $445.2 (253.1 + 192.1)) million and Techo's equity ownership is 40% of that, as we would expect if the forfeiture option were worth nothing. In fact it is worth a mere $8,000 and Techco's precise ownership is 40.001%.
(8) In expected present value terms, Cashco reduces its invesment cost by $54,000 but forfeits equity worth $46,000 for a net gain of $8,000.

Techco
Estimate of the Fair Value of Deal Equity & Options
Volatilty of Companies Comparable to the JV

Company	Total Debt (1)	Market Cap (1)	Equity Volatility (1)	Asset Volatility (2)
Comp 1	$27,446	$97,325	42%	35%
Comp 2	$12,319	$48,962	28%	24%
Comp 3	$45,984	$160,964	46%	39%
Comp 4	$9,742	$124,230	52%	49%
Comp 5	$78,632	$158,953	33%	25%
Comp 6	$13,209	$76,021	39%	35%
Comp 7	$24,398	$142,864	45%	40%
Mean			41%	34%
Median			42%	35%
Selected				**35%**

Footnote(s):

(1) Source: Most recent four years of data from S&P Capital IQ.
(2) Based on the Hamada Model
(3) Based on assumption of no debt financing.