LECTURE 3

CHAPTER 6 (PARTIAL)

Market Efficiency & Investment Valuation - EMH and Behavioral Analysis

Professor's Notes

Are markets efficient?????

- The Quants Book – Eugene Fama and Cliff Asnes

Random Walks and the Efficient Market Hypothesis

Example - $100, predicting the stock will go to $110 in 3 days - if everyone uses the same model, no one is willing to sell – the net effect would be that the stock jumps to $110.

The theory of movement of the stock is that it moves on new information, which by definition should be unpredictable, therefore the movements of the stock should be unpredictable – this is the essence of the argument that stock prices should follow a **RANDOM WALK** – that is, that price changes should be random and unpredictable.

The notions that all stocks already reflect all available information is referred to as the **EFFICIENT MARKET HYPOTHESIS (EMH).**

Example: "found a $20 bill on the ground" story

COMPETITION AS A SOURCE OF EFFICIENCY – models created, gathering information, go to investor's conferences, read the body language….. Picking a horse on the track – examining the way the horse before it runs – the OTC example (the bum)

"Information is Power" – "behind the hand – 50/50 - Spend money on information – seeking the Alpha

Efficient Market Hypothesis (EMH) – Implications

- Technical Analysis (patents in the stocks) –
  - Support Levels / Resistance Levels – example on page 236 (8.2) $72 and then decline to $65…. If it begins to climb, the expected resistance level could be at 72 where $72-holders want to recover their investment.
  - Chartists – study chart for patents.

- Fundamental Analysis (Earnings/Dividends/ financial analysis

Reviewed before (Passive Vs Active Portfolio Management)

ARE MARKETS EFFICIENT?

Few topics:

- Size / magnitude
- Selection Bias Issues (investment scheme – i.e. Leverage) – "Donkey" example
- Dart throwing
- Lucky Event Issue – always read about some investor made a lot of profit (50/50 coin toss , but if 10,000 participate in the coin toll, it won't be surprise that one has a 75%/25% - lucky on the day of the event)
- "Serial Correlation" of stock – lucky streaks
- Looking for behavioral motivations for buyin/selling:
  - High Exposure
  - Risk Appetite
  - Tax motivation
  - Resource allocation
- Buy and Hold strategy - despite volatility – upward movement

Behavioral Finance - People are people and they make decisions differently

- "Irrational Exuberance" – Greenspan 12/2006 – affected the stock markets around the world after he mention that word (Tokyo was down 3.0%, Hong Kong was down 2.0%, UK down 3.0%, U.S. down 2.0%)

wo theories:

1. Investors do not always process information correctly
2. Inconsistent decisions

i.e. Wrist Watch example -

Few Topics for discussions

INFORMATION PROCESSING

- Forecasting Errors – High multiples
- Overconfidence – "Irrational Exuberance"
- Conservatism – the article of banks – in Leverage Cycle

BEHAVIORAL BIASES

- Bluffing – Game theory – "All-in" has nothing, betting slow could have a good hand.
- Mental Accounting – managing other people's money versus your own – Hedge funds always market that aspect of it.
- Regret Avoidance – unconventional choices Vs acceptable choices when wrong
- Prospect theory - as wealth increases more risk averse.

Speculative Bubbles and Black Swans

Investors buy into fads or get-rich-quick schemes, and the crashes when these bubbles have ended, and suggest that there is nothing to prevent the recurrence of this phenomenon on today's financial markets – The Great recession of 2008.

Market Reaction to Information Events

- Earnings announcements
- Investment and Project Announcements
- Analyst recommendations

CHAPTER 7 (Partial)

The Risk Free Rate

Most risk and return models in finance start off with an asset that is defined as risk free, and use the expected return on that asset as the risk free rate.

What makes it risk free?? – probability of Default = 0 , the Standard deviation (σ) = 0. – Government Securities / Treasury rate is considered risk free .

- It's important to note that the liquidity risk is not included in the risk free assessment

Premium rate is the rate over the risk free. Premium starts when risk is included in the calculations like the beta (β) is the CAPM model where the volatility quantifies risk..

Nominal Vs Normal Risk Free Rates

Under inflationary conditions valuation is often done in real terms – basically cash flows are estimated using real growth rates and without allowing for the growth that comes from price inflation.

The Equity Risk Premium

The notion that risk matters, and that riskier investment should have a higher expected return than safer investments to be considered good investments, is intuitive.

CAPM:

$$\text{Expected Return on Equity} = Rfr + \beta \cdot p$$

Where Rfr = Risk Free rate
β = Beta
p = (Historical Return of Equity – Rfr)

Historical Premiums – from 1926 – composite of data

Professors and scholars like William Sharpe have gathered all the info on Equity premiums going back to 1926. A lot of the analysts use this premium table to calculate their own CAPM – see below

Equity Risk Premiums (1926-2007)		
Decile	Mkt Cap $MM	Risk Prem.
1	524,351	7.03%
2	10,344	8.05%
3	4,144	8.47%
4	2,177	8.75%
5	1,328	9.03%
6	840	9.18%
7	538	9.58%
8	333	9.91%
9	193	10.43%
10	**85**	**11.05%**

There are however, three reasons for the divergence in risk premiums:

1. Time periods used (shorter periods vs longer periods)
2. Choice of risk-free security (risk free has been upper slopping curve in the last 70 years – effecting premiums)
3. Arithmetic and geometric measurements – historical as based on arithmetic averages.

CHAPTERS 8 (Partial)

Estimating Risk Parameters and Costs of Financing

The Cost of Equity and Capital

Cost of Equity = Riskless Rate + Beta x Premium

Betas Review (lecture 2) –

Leveraged Beta:

Degree of Financial Leverage:

- Other things remaining equal, an increase in financial leverage will increase the beta of the equity in a firm.
- We will expect that, assuming fixed interest payments on debt result in increasing income in good times and decreasing income in bad times.
- Higher leverage increases the variance in net income and makes equity investment in the firm riskier.
- If all the firm's risk is borne by the stockholder (the beta of debt is zero), and debt has a tax benefit to the firm, then

$$\beta_L = \beta_u [1+(1-t)(D/E)]$$

where β_L = Leveraged beta for equity in the firm

β_u = Unevered beta of the firm (i.e. the beta of the firm without any debt)

t = Marginal tax rate

D?E = Debt to Equity ratio (Market Value)

Example:

Boeing – via regression (Boeing stock vs Market)– the period from 1985-2000 the beta was 0.56. Since this regression uses stock prices over this period, we calculated the average Debt/Equity ratio for 1996-2000 using MV of debt and equity – calculated at 15.56%

At a tax rate of 35%, the

Unlevered beta = Current beta / [1 + (1- tax rate) (Average debt/equity)]
= 0.56 / [1 + (1-.35)(0.1556)] = 0.51

So the

Leveraged beta = Unleveraged beta x [1 + (1-tax rate)(debt/equity)]

At 10% Debt/Equity the Leveraged Beta is 0.543

At 25% Debt/Equity the Leveraged Beta is 0.59

At 66.67%% Debt/Equity the Leveraged Beta is 0.73

CHECK SPREADSHEET – ALEXANDRIA

ALEXANDRIA HOTEL PROPERTY						
LBO Equity Analysis using CAPM						
TRANSACTION SOURCES & USES						
Sources:	**Debt Capacity (EBITDA x)**	**Amount**	**% Capital**	**Expected Return**	**WACC (Pre-Tax)**	**EBITDA Multiple**
Bank Loan	**2.5x**	50,000,000	40.5%	5.344%	2.16%	2.5x
Mezzanine Note		30,000,000	24.3%	11.000%	2.67%	1.5x
Total Debt	**4.0x**	80,000,000	64.7%		4.83%	**4.0x**
Equity		43,600,000	35.3%	**17.49%**	6.17%	2.2x
Total Sources		123,600,000	100.0%		11.00%	**6.2x**
Uses:	**1st Year's EBITDA Multiple**	**Amount**	**% of Total Uses**		**WACD = 7.465%**	
Purchase Price (EV - including Debt)	**6.0x**	**120,000,000**	97.1%			
Transaction Fees & Expenses	**3.0%**	3,600,000	2.9%			
Total Uses		123,600,000	100.0%			

COST OF DEBT AND EQUITY CALCULATIONS		
COST OF BANK DEBT CALCULATION (Floaring Rate)		
3M-LIBOR Assumptions	**Loan Spread**	**Initial All -In**
0.28%	**4.00%**	**4.28%**
COST OF MEZZANINE NOTE CALCULATION		
	11.00%	
COST OF EQUITY CALCULATION E (re) = rf - β . Pe + e		
6-year Treasury Note [rf]		2.57%
Beta for Publicly Traded Hotel [β]		1.350x
Equity Premium [Pe]		11.05%
Firm Specific Risk Premium [e]		0.0%
Cost of Equity		**17.49%**

DEBT ASSUMPTIONS & RETURN ANALYSIS									
Bank Loan Information	***Debt IRR***	**Terms**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Amount Outstanding (End of Year)		**50,000,000**	47,000,000	42,000,000	37,000,000	31,000,000	24,000,000	15,000,000	-
Schedule Principal Payments		**7 years**	3,000,000	5,000,000	5,000,000	6,000,000	7,000,000	9,000,000	15,000,000
Interest Payment (Calc based on last Year's Outs)		**5.36%**	2,150,000	2,256,000	2,226,000	2,331,000	1,953,000	1,512,000	945,000
Total Financing Payment	5.364%	(50,000,000)	5,150,000	7,256,000	7,226,000	8,331,000	8,953,000	10,512,000	15,945,000
LIBOR RATE		*0.30%*	*0.30%*	*0.80%*	*1.30%*	*2.30%*	*2.30%*	*2.30%*	*2.30%*
LIBOR Rate Increase Assumptions			*0.00%*	*0.50%*	*0.50%*	*1.00%*	*0.00%*	*0.00%*	*0.00%*
Corporate Bond Information									
Amount Outstanding		**30,000,000**	30,000,000	30,000,000	30,000,000	30,000,000	30,000,000	30,000,000	30,000,000
Schedule Principal Payments		**10 Years**	-	-	-	-	-	-	-
Interest Payment (Calc based on last Year's Outs)		**9.00%**	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000
Total Financing Payment	9.000%	(30,000,000)	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000
Total Financing			7,850,000	9,956,000	9,926,000	11,031,000	11,653,000	13,212,000	18,645,000
Total Debt Outstanding			77,000,000	72,000,000	67,000,000	61,000,000	54,000,000	**45,000,000**	30,000,000