FAIR VALUE OF LIABILITIES

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Fair Value of Liabilities – Recent History

- Fair value measurement of liabilities clarified (changed) by ASU 2011-04
- BEFORE:
  - Quoted price when traded as an asset
  - Quoted prices for similar liabilities or similar liabilities when traded as assets
  - Another valuation technique (ex. Income or market approach "…based on amount at the measurement date that the reporting entity would pay to transfer the identical liability <u>or would receive to enter into the identical liability</u>.")

Fair Value of Liabilities – Recent History (cont'd)

- ASU 2011-04 included items in shareholder' equity and bifurcated guidance into liabilities/equities that are held as assets and those that are not.
- AFTER (if held as an asset):
  - Quoted price for the identical item held by another party as an asset
  - If that's not available, other observable inputs like prices in inactive markets
  - Another valuation technique (ex. Income approach "…that takes into account the future cash flows that a market participant would expect to receive from holding it as an asset…" or a market approach that uses "…quoted prices for similar [liabilities or equities] held by other parties as assets.")

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Fair Value of Liabilities – Recent History (cont'd)

- AFTER (if not held as an asset):
  - A reporting entity shall measure the fair value of the liability or equity instrument using a valuation technique from the perspective of a market participant that owes the liability or has issued the claim on equity.
  - Reporting entities might consider the amount that a market participant would receive to enter into or issue an identical liability or equity instrument.
- Example – Asset retirement obligation

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Fair Value of Liabilities – Recent History (cont'd)

- Why the change?
  - November 2010 VRG meeting on contingent consideration issued in a business combination
  - Conceptual basis for difference among liability classes?
- Comfort level
  - Accounting conservatism
  - Financial reporting implications of changes in value

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Fair Value of Liabilities – Recent History (cont'd)

- Practice issues on the horizon?
  - Unit of account mismatch between liability issuer and asset holder?
  - What's a characteristic of an asset versus a characteristic of a liability?
    - "A reporting entity shall adjust the quoted price of a liability or an instrument classified in a reporting entity's shareholders' equity held by another party as an asset only if there are factors specific to the asset that are not applicable to the fair value measurement of the liability or equity instrument. A reporting entity shall ensure that the price of the asset does not reflect the effect of a restriction preventing the sale of that asset."

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Fair Value of Liabilities Under ASC 820

The fair value measurement premise for liabilities assumes both of the following:

- The liability is transferred to a market participant at the measurement date (the liability to the counterparty continues; it is not settled)
- The nonperformance risk relating to that liability is the same before and after its transfer
  - The liability is assumed to be transferred to a market participant with the same credit worthiness as the current holder of the liability

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Fair Value of Liabilities Under ASC 820

- If a quoted price in an active market for the identical liability is available, the quoted price should be used
- If a quoted price for the identical liability is not available, one or more of the following techniques should be used:
  - A valuation technique that uses:
    - The quoted price of the identical liability when traded as an asset
    - Quoted prices for similar liabilities or similar liabilities when traded as assets
    - Quoted prices may need to be adjusted to account for factors that are unique to the traded asset or traded similar liabilities that are not applicable to the fair value measurement of the liability
  - Another valuation technique that is consistent with the principals of ASC 820:
    - Income approach
    - Market approach

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Income Approach

- The income approach should always be considered because it forces the analyst to consider factors such as timing of principal and interest payments, credit quality of the issuer and likelihood of default.
- Factors unique to the instrument, such as transfer restrictions, seniority or subordination, collateral, sinking fund provisions and guarantees can be modeled into the market yield.
- Other factors, such as put, call and conversion features may require a more complex model to estimate fair value.
- A critical component of the income approach is the yield required by market participants.

Development of a Market Yield

- There are several approaches to develop a market yield:
  - Yield on the subject company's other outstanding debt
    - Company must have actively traded debt
    - Be aware of seniority of the debt instruments
    - Compare debt characteristics (coupon rates, maturity)
    - Credit default swap spreads may be available
  - Credit scoring analysis
  - Comparable company / debt analysis
- The discount rate may be a single fixed amount, or it may be a yield curve (i.e., a term structure of interest rates)

Market Yield: Credit Scoring Method

- Credit rating agencies develop a credit score based on certain key metrics of cash flow and leverage
- The table below summarizes the metrics examined by Standard & Poor's

Key Ratios	
Ratio	**Formula**
Operating income before depreciation	Operating income before depreciation and amortization/revenues and amortization to revenues
EBIT interest coverage	EBIT/interest
EBITDA interest coverage	EBITDA/interest
FFO interest coverage	FFO, plus interest paid, minus operating lease adjustment to depreciation/interest*
Return on capital	EBIT/average beginning of year and end of year capital
FFO to debt	FFO/debt
FOCF to debt	FOCF/debt
Discretionary cash flow to debt	Discretionary cash flow/debt
Net cash flow to capital expenditures (capex)	Net cash flow/capex
Debt to EBITDA	Debt/EBITDA
Debt to debt plus equity	Debt/debt plus equity

*The numerator reflects FFO before interest paid; the denominator reflects interest expense.

S&P Credit Ratios

Adjusted Key Industrial Financial Ratios, Long-Term Debt--U.S.						
Medians of three-year (2006 to 2008) averages						
	AAA	**AA**	**A**	**BBB**	**BB**	**B**
Oper. income (bef. D&A)/revenues (%)	27.8	25.2	18.8	17.7	17.2	15.7
Return on capital (%)	30.5	29.9	21.7	15.1	12.6	8.6
EBIT interest coverage (x)	34.9	16.6	10.8	5.9	3.6	1.4
EBITDA interest coverage (x)	38.8	20.8	13.3	7.8	5.1	2.2
FFO/debt (%)	190.2	76.9	54.0	34.8	26.9	11.6
Free oper. cash flow/debt (%)	154.6	42.5	30.9	14.0	7.8	2.1
Disc. cash flow/debt (%)	93.9	26.5	20.2	8.4	5.8	1.0
Debt/EBITDA (x)	0.4	1.0	1.5	2.3	3.0	5.4
Debt/debt plus equity (%)	13.3	27.6	36.1	45.3	52.9	75.6
No. of companies	6	15	100	202	271	321

- Source: S&P Ratings Direct
- Recent editions of the Ratings Direct do not include median metrics for CCC to C rated debt due to the wide dispersion of ratios amongst entities with these credit ratings

Market Approach

- Very difficult to identify comparable debt (Level 3)
  - Credit quality
  - Maturity and duration
  - Terms and features
- Debt coverage technique assumes the sale or liquidation of the enterprise to repay outstanding debt
- Use debt coverage technique very cautiously
  - Requires control of the enterprise – not appropriate for minority positions
  - If sale is assumed to be triggered by controlling equity holders, sale price should reflect the distressed situation
  - If sale is assumed to be triggered by debt holders through exercise of covenants, liquidation values should be used

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Alternative Models

- Callable / Putable Instruments: Can be valued using a lattice model (Hull-White) that projects out future interest rates. At each point in the future, the model tests whether calling (putting) the bond or holding is the best option.
- Convertible Instruments: Preferred method to value this instrument is a lattice model that accounts for the lower required yield when the conversion feature is in the money. Can be valued as a bond using traditional cash flow model with the value of the conversion feature being valued separately using a Black-Scholes Option Pricing model. This method will systematically under-value the instrument.
- Distressed Debt: Distressed debt can be difficult to value using conventional models due to the uncertainty of receiving scheduled interest and principal payments and the difficulty of estimating a market yield. Distressed debt may be valued using either the back-solve method or a contingent claims analysis, depending on the circumstances.

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Contingent Consideration

- Accounting
- Data on earn-outs
- Thoughts on valuation

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Contingent Consideration

- Accounting evolution

Beginning is 2009, acquiring firms were required to report at fair value any contingent consideration (earn-out) that was part of the purchase price of an acquisition. Furthermore, this liability had to be marked to market each reporting period and its change in value flowed through the income statement. This change from recognizing the payment when and if it occurred has a substantial effect on the value of the initial goodwill in a deal and also on future earnings of the acquirer. Because earn-outs can be difficult to value, this change also introduced significant valuation challenges.

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Contingent Consideration

- Data on incidence
  - "2011 Private Target M&A Deal Points Study"[1] 100 deals from 2010.
  - "2012 Contingent Consideration Study, Earn-out Structuring and Valuation"[2] D&P 120 deals from 2009 to 2011.
  - "Contingent Payments in M&A Deals" PwC 3,800 deals from 2000 to 2011.

[1]For Transactions Completed in 2010) A Project of the M&A Market Trends Subcommittee, Mergers & Acquisitions Committee of the American Bar Association's Business Law Section

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Contingent Consideration

- ABA and D&P
- Underlying variable:
  - Revenue 37% (60%) Earnings 32% (38%)
  - Both 5% Other 26% (26%)
  - Life sciences (54%), Tech (18%), Other (14%)

- Term
  - < 12 mo. 9% 12 mo 18%
  - 12 to 24 mo 18% 24 mo 12%
  - 24 to 36 mo 9% 36 mo 24%
  - 36 to 60 mo 6% > 60 mo 6%

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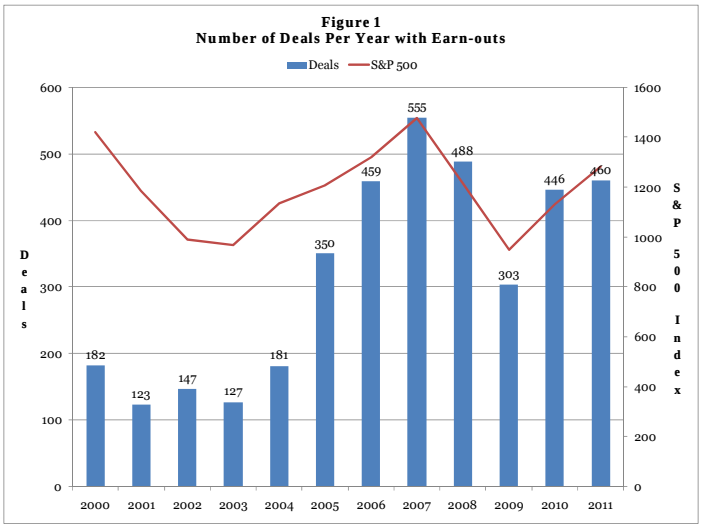
- "Contingent Payments in M&A Deals" PwC



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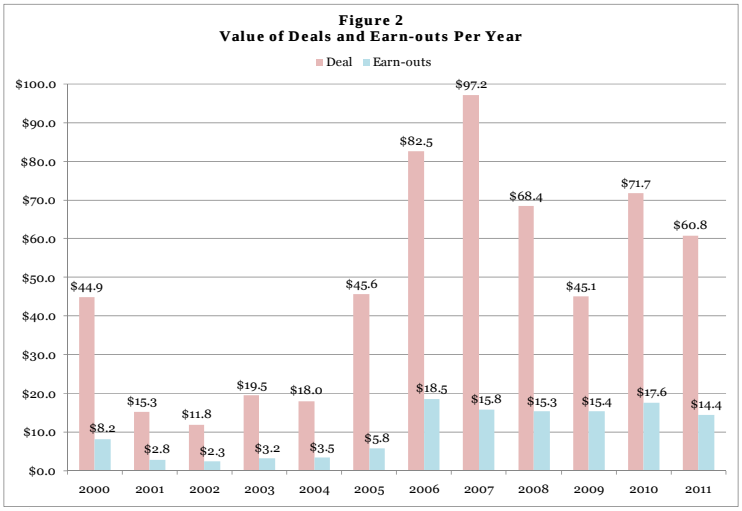

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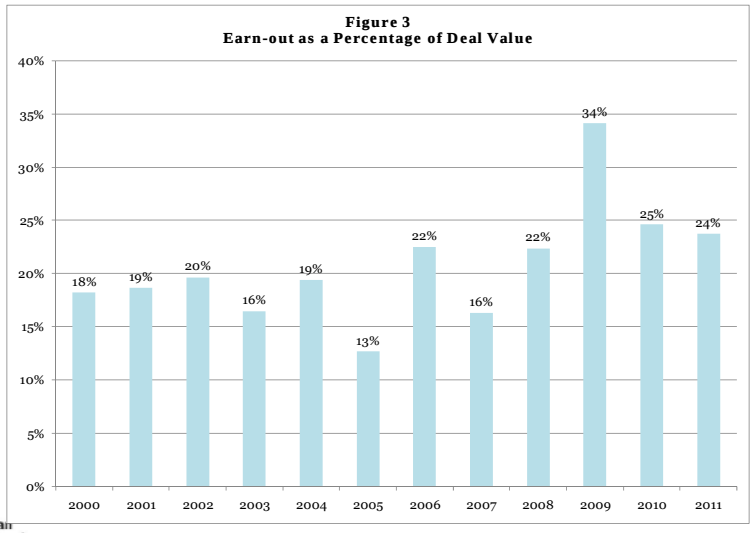

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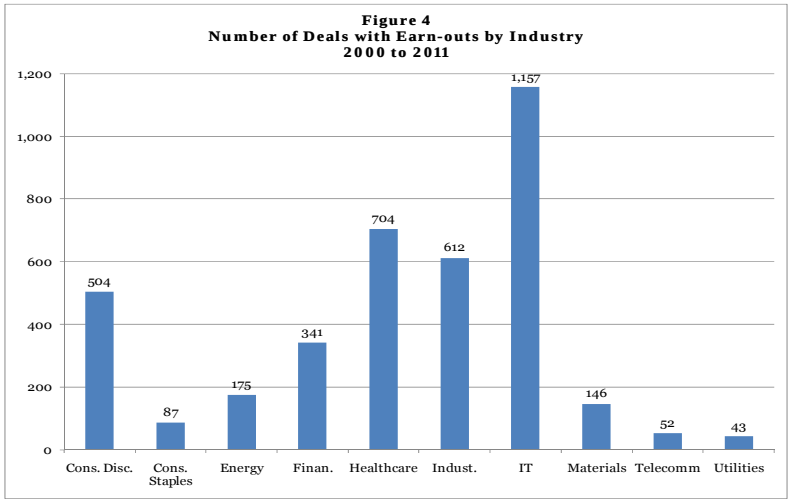

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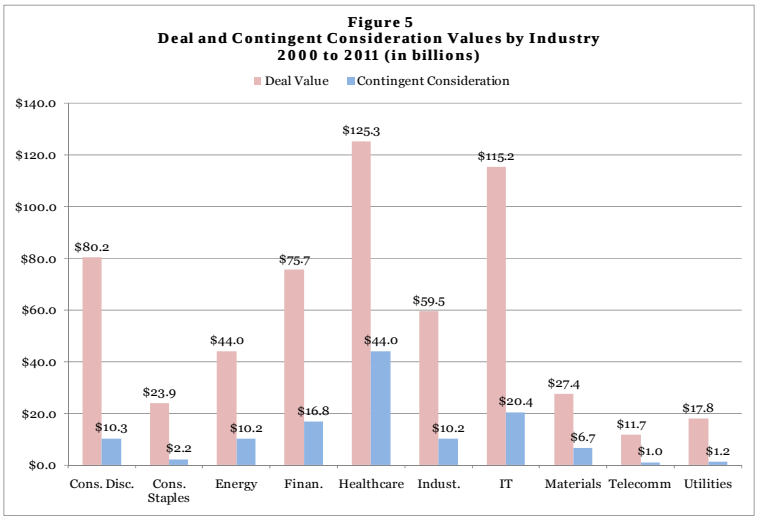

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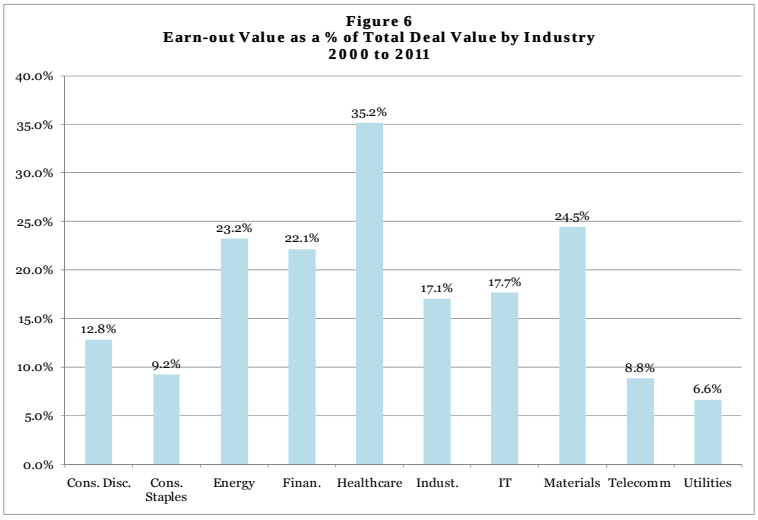

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Contingent Consideration

- For some detailed thoughts on earn-out valuation, see:
  - Dwight Grant, "Valuing Contingent Consideration Using Option Pricing," Business Valuation Review 30 4 (2011) 121 - 131.
  - It is important to distinguish three earn-out categories:
    1. Payoffs tied to variables with no systematic risk. Examples include technological progress, FDA approvals, etc. These payoffs need to be adjusted for the probabilities of their occurrences, the risk-free rate and credit risk.
    2. Payoffs with systematic risk but short terms to maturity. These payoffs need to be adjusted for the probabilities of their occurrences, the risk-free rate, credit risk and systematic risk. Because the term is short the influence of the discount rate is small and errors in estimating it have relatively little influence on the values of earn-outs.
    3. Payoffs with systematic risk but longer terms to maturity. These payoffs need to be adjusted for the probabilities of their occurrences, the risk-free rate, credit risk and systematic risk. Because the term is longer the influence of the discount rate is greater and errors in estimating it have more influence on the values of earn-outs. The discount rate is difficult to estimate.

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Contingent Consideration

- Payoffs with systematic risk but longer terms to maturity.
- When a payoff is more or less symmetric, discounting expected cash flows works.
- Many earn-out payoffs are asymmetric. For example, you receive $0 until you reach a threshold and then receive either a lump sum or a percentage of the amount above the threshold. You cannot value such option-like payoffs on the basis of the expected value of the underlying variable. Such earn-outs are also difficult to value by discounting the expected cash flow of the earn-out, because estimating risk-adjusted discount rates is difficult.
- For non-linear payouts, for example call options or participating preferred stock or convertible bonds, we use the Option Pricing Model.
- For non-linear earn-outs with systematic risk we also use the Option Pricing Model. Because the underlying asset is often something that is not priced in the market, such as revenues, we often refer to this as a "real options" valuation.

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Overview of Valuation Approaches
An Example to be valued using PWERM and OPM

Company A, an all equity firm, buys a division of Company B for $200 million in cash and agrees to an earn-out.

Earn-out requires Company A to pay revenue above $850 million in cash at the end of the 2nd year.

Here are the data needed for valuation.

Distribution of Revenue in Two Years

			Scenario	Revenue	Probability	Payout	% Deviation
k_{rf}	0.50%		1	$1,100	10%	$250	32%
k_d	2.95%		2	$1,000	25%	$150	22%
$k_m - k_{rf}$	6.00%		3	$800	30%	$0	0%
βe	1.50		4	$600	25%	$0	-29%
β_R	0.50		5	$500	10%	$0	-47%
k_e	9.50%	Expected value		$800			
k_R	3.50%	Annual volatility				18.1%	

Example: PWERM

Appraisers often calculate the expected value of the payout and discount it at the WACC, which in this case is the cost of equity. The earn-out is the maximum of $0 or Revenue - $850 million for each scenario. The present value of the earn-out when discounted at the WACC is $52.13. We will see that this value is too high because the discount rate is too low.

Valuation of the Earn-out

			Scenario	Revenue	Probability	Pay out
k_{rf}	0.50%		1	$1,100	10%	$250
k_d	2.95%		2	$1,000	25%	$150
$k_m - k_{rf}$	6.00%		3	$800	30%	$0
βe	1.50		4	$600	25%	$0
β_R	0.50		5	$500	10%	$0
k_e	9.50%	Expected value		$800		$62.50
k_R	3.50%	Two year discount factor for WACC = 9.5%				0.8340
		Present value of earn-out				$52.13

Example: OPM-1

- We illustrate the OPM in two ways. Below we use the same probability distribution as in the PWERM example. We do not usually employ PWERM for this type of analysis so this should be understood as an example that facilitates understanding.
- Step 1: We know the risk of Revenue but not the risk of the earn-out therefore we adjust each of the Revenue cash flows for risk. For example,

  $1{,}036.86 = 1{,}100/(1.03)^2 = 1{,}100/(1 + \beta_R(k_m - k_{rf}))^2$
- Step 2: Calculate the earn-out payments from adjusted Revenue cash flows and discount at the cost of debt to reflect default risk. See the green figures.

			Scenario	Revenue	Probability	Adjusted (Risk-neutral) Revenue	Payment
k_{rf}	0.50%		1	$1,100	10%	$1,036.86	$186.86
k_d	3.00%		2	$1,000	25%	$942.60	$92.60
$k_m - k_{rf}$	6.00%		3	$800	30%	$754.08	$0
βe	1.50		4	$600	25%	$565.56	$0
β_R	0.50		5	$500	10%	$471.30	$0
k_e	9.50%		Expected value	$800			$41.83
k_R	3.50%		Two year discount factor for 2.95%				0.9435
			Present value of earn-out				$39.47

Example: OPM-2

- Below we use the annual volatility from the probability distribution, 18.1% in a standard Black-Scholes equation. We say standard but note that the value of the underlying has been computed: $739.64 is the present value of the revenue – it is the value it would have if it were a priced security.
- $739.64 = 800/(1+.005+.030)^2 = 800/(1 + k_{rf} + \beta_R(k_m - k_{rf}))^2$
- Note that the two OPM values for the earn-out are quite similar but smaller than the PWERM answer.

S	$739.64
X	$850.00
r	0.50%
σ	18.1%
T	2.000
c	$39.43
Credit adjusted	$37.57

General Concepts in Real Estate Liabilities Valuation

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INTRODUCTION

- Common valuation techniques
- Common pitfalls
- Valuation tools and sources of data
- Discount rate considerations
- Factors to consider in today's market

Common Valuation Techniques

- Income Approach – Discounted Cash Flow method
  - The treatment of risk in either the discount rate (Indirect Method) or in the cash flows (Direct Method) are method classifications under the Income Approach to valuation of liabilities
- Market Approach – Values based on observed market transactions of like individual or pools of real estate liabilities
- Cost Approach – Not generally applied as the assets cannot be replaced with a similar asset due to the unique nature of each loan.

Common Pitfalls

- Discounting credit adjusted cash flows using a market yield will double count credit risk
- Including recovered principal in the active outstanding balance
- Pooling liabilities and not selecting weighted average characteristics for terms
- Modeling cash flows for floating rate loans and ignoring caps, floors and periodic change limits on rates and/or spreads
- Not making sure all payments are captured when modeling loan amortization schedules and cash flows
- Models are not updated to meet changing market conditions and approaches

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Valuation Tools and Sources of Data

- Bloomberg
  - BMMI screen offers access to a variety of trust reported data
  - CMB, LLKU among several CRE loan tools
- Old-fashioned cold calling to sample indicative retail origination rates
- Relationships with commercial real estate lenders and traders can prove critical when looking for indications or better yet, rate sheets
- Risk analytics solutions such as Moody's CMM, MPA
- Actual property sale and cap rate data through vendors such as Real Capital Analytics (RCA) and REIS
- Research reports through Wall Street firms, independent research houses and brokerage firms
- Case-Schiller HPI data, CoreLogic LoanPerformance and FRED

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Discount Rates

- Direct Method

▪*Under the Direct Method, probability of default and loss severity assumptions are applied to adjust contractual cash flows. The credit adjusted expected cash flows are then discounted to present value at a rate that does not reflect credit risk.*

  - risk free rate
  - cost of capital in excess of risk free rate
  - liquidity premium
  - market risk (interest rate risk)
  - servicing costs

- Indirect Method

▪*Under the Indirect Method, contractual cash flows are modeled and then discounted using a credit risk adjusted rate that takes into account the risk-free rate plus premiums for all risks, including market risk, liquidity risk, **and** credit risk.*

Discount Rate Considerations

- Consistency between cash flows and discount rate from a pre-/post-tax perspective
- Using a single discount rate based on weighted average life (WAL) expectations versus deriving floating discount rate
- Asset holder's perspective versus market participants' regarding funding and servicing
- Conservatism or aggressiveness of other assumptions (defaults and recoveries)
- Recognizing what level of cash flows are being discounted (e.g., contractual, contractual w/ prepays or payment rate, expected, or equity contribution)

Factors to Consider in Today's Market

- Defining the market participant
- Understanding the valuation need
  - It is important for the valuation approach and considerations to be consistent with those for related structured finance products or derivatives, as well as the collateral.
- Understanding the denominator in loan-to-value metric
  - LTV is a key metric in estimating the appropriate adjustments to cash flows or discount rates. Third-party appraisals have become important tools used by lenders and borrowers and should be appropriately considered.
  - A May 2012 analysis by Barclays on CRE loans found that recoveries on loans liquidated in 2009 were 20% lower than the appraised collateral value. The report found that the date of the appraisal is a critical factor and suggested that investors should apply a discount to older appraisals.
  - It is important for older appraisals to have an alternate method to value the underlying property, e.g., NOI divided by cap rates or applying other market appropriate factors can provide a rough check on a property appraiser's estimate of value.

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Questions?

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