

### Old Revenue Recognition Principles

Earnings = Revenues – Expenses  
Old Revenue Recognition Intuition:

- **Earned** Earnings process substantially complete
- **Collectible** Cash collection reasonably assured

Expenses matched to revenues by matching principle

### Bad Debts

Two ways of accounting for bad debts:

- the direct method: required for income taxes. cons:
  - Improper matching of expenses to revenues
  - More reliable info but less relevant (i.e. less timely)
- the allowance method: two methods
  - percentage of sales
  - aging method.

A/R (net) = A/R (gross) – Allowance for doubtful accounts (ADA)  
A/R (net) = A/R (gross) - ending ADA

### The BASE equation

Beginning balance  
+ Additions  
– Subtractions  
= Ending Balance  
Example:

Beginning balance (e.g. ADA - allowance for doubtful accounts)

+ Additions (e.g. bad debt expense a.k.a. provision charged to income statement)

– Subtractions (e.g. write-offs a.k.a. amount deemed uncollectible)  
= Ending Balance  
Beginning ADA + Bad Debt Expense – Amounts Written Off = Ending ADA

### Allowance Method 2: Aging Method

#### Ratios Involving Receivables

A/R Turnover = Revenue / Average Accounts Receivable (net)

Days receivables = (1 / A/R Turnover) \* 365

#### Liability for Return Allowances

Allowances for product returns are very similar to the Allowance for Doubtful Accounts, except that Allowances for product returns are a liability, whereas Allowance for Doubtful Accounts is a contra-asset.

#### Key Terms and Usage

- **A/R:**Accounts Receivable.
  - Customer purchases’ made on account (i.e. you will receive a payment later
  - I/S: Revenue is recognized when earned, not received
  - B/S: Asset account impacted
- **ADA:**Allowance for doubtful accounts
  - Company provisions for uncollectible A/R

- I/S: Depends on how it changes
- B/S: Contra-asset account impacted
- **BDE:** Bad debt expense
  - Future projections for uncollectible A/R
  - I/S: Expense recognized as % of sales
  - B/S: Increase ADA account by same amount
- **Write-off**
  - A/R that “goes bad” in that time period (i.e. it becomes clear that the customer cannot pay)
  - I/S: No impact
  - B/S: Reduce ADA and A/R

### Week 3: Inventory and IFRS; Long-Term Assets

#### The Inventory Equation

$BegInventory + Additions = COGS + EndInventory$

#### US LIFO Conformity Rule

LIFO for tax purposes  $\Rightarrow$  LIFO for financial reporting  
FIFO for tax purposes  $\Rightarrow$  FIFO for financial reporting

#### Comparability

LIFO and FIFO firms have different account, so we need to adjust the accounting numbers to make them comparable. Data is available to adjust the LIFO firm to FIFO (but not to adjust FIFO to LIFO)  
 $LIFO Reserve = EndingInv_{FIFO} - EndingInv_{LIFO}$   
 $EndingInv_{FIFO} = EndingInv_{LIFO} + LIFO Reserve$   
Derivation of adjustment LIFO to FIFO:

(1):  $EndInv_{FIFO} = BegInv_{FIFO} + Additions - COGS_{FIFO}$

(2):  $EndInv_{LIFO} = BegInv_{LIFO} + Additions - COGS_{LIFO}$

(1)-(2):  
 $EndInv_{FIFO} - EndInv_{LIFO} = BegInv_{FIFO} - BegInv_{LIFO} - COGS_{FIFO} - (-COGS_{LIFO})$   
 $EndLIFO Reserve = BegLIFO Reserve + COGS_{LIFO} - COGS_{FIFO}$   
 $\Delta LIFO Reserve = COGS_{LIFO} - COGS_{FIFO}$

$COGS_{FIFO} = COGS_{LIFO} - \Delta LIFO Reserve$

#### Ratios Involving Intentyory

$InventoryTurnover = \frac{COGS}{AverageInventory}$

$DaysInventory = \frac{365}{InventoryTurnover}$

#### FIFO/LIFO Summary

- LIFO results in a more accurate income statement; FIFO results in a more accurate balance sheet.
- LIFO-FIFO is import to compare across firms and adjust the LIFO reserve for comparability.

#### PPE: Property, Plant and Equipment

1. Whats the acquisition cost?
2. How much is the estimated salvage value? (value at disposal net of selling costs)
3. What is the expected useful service life? (period of usage not physical life)
4. What is the depreciation pattern?

Straight Line Method of Depreciation :

$ExpensePerYear = \frac{AcquisitionCost - SalvageValue}{EstimatedUsefulLife}$

#### Gain or Loss on Sale or Disposal of PPE

Procedure for sale or disposal of PPE:

1. Record cash or the market value of the asset received for the PPE

2. Record disposal of the asset by removing the cost of the asset from PPE
3. Remove the accumulated depreciation associated with the asset
4. Calculate gain or loss as follows:  
 $Cash - (Cost - AccDep) = Gain(Loss)$

Disposal of asset G/L:  $G/L = Cash - (Cost - AccDep)$   
 $G/L = SalesPrice - (GrosPPE - AccDep)$   
 $G/L = AccDep + (GrossPPE - SalesPrice)$   
 $G/L = AccountingDepreciation - EconomicDepreciation$   
We impair or write down the asset by increasing accumulated depreciation.

$Acquisitions = EndingPP\&E - BeginningPP\&E + PP\&ESold$

$Beginningaccumulateddepreciation + Depreciationexpense - depreciationonsoldassets = Endingaccumulateddepreciation$

$Gain(Loss) = Saleprice - BookValue$

$BookValue = Purchaseprice - AccumulatedDepreciation$

### Week 4: Intangible Assets; Statement of Cash Flows

#### Intangible Assets

Intangible assets include:

- Intellectual property (Patents, Copyrights, Trademarks)
- Licenses, Franchise rights
- Brand value
- Customer lists
- Goodwill

#### Statement of Cash Flows

Financial statements links

$A = L + SE$

$\Delta A = \Delta L + \Delta SE$

$\Delta Cash = -\Delta NonCashAssets + \Delta L + \Delta SE$

It has three sections

- **Operating:** Primary business activities.
- **Investing:** Acquiring and selling productive assets.
- **Financing:** Related to external sources of financing

#### Working Capital (WC)

$WC = CurrentAssets - CurrentLiabilities$

$Non - Cash - WC = CurrentAssets - Cash - CurrentLiabilities$

CFO : Cash Flow from operations NI: Net Income  
 $CFO = NI - Accruals$

Start with Net Income, then:

- 1) **Add non cash expenses:** expenses that reduce NI
- 2) **Add (subtract) gains (losses)** associated with investing activities
- 3) **Add (subtract)** changes in non-cash WC. e.g. if A/R decreases by \$100, add \$100 to NI. If A/R decreases by by \$100, subtract \$100 to NI.

$FreeCashFlow = OperatingCashFlow - CapEx$

Accruals are the difference between net income and cash flow from operations, that is:

$NetIncome = CashFlowfromOperations + Accruals$   
 $Accruals = NetIncome - CashFlowfromOperations$

Change in Cash = Cash Flow From Operations (CFO) + Cash Flow From Investing + Cash Flow From Financing

$Beg.RetainedEarnings + NetIncome - Dividends(DividEnd.RetainedEarnings)$

### Week 5: Acquisitions / Financial Investments

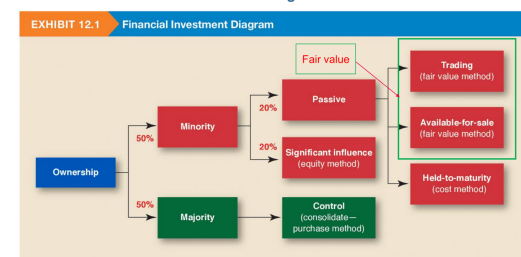
#### Acquisitions and goodwill

Steps for allocating the purchase price :

1. Fair value of tangible assets and liabilities.
2. *Identifiable* intangible assets: customer relationships, trade names, patents, etc. Subject to amortization with zero salvage value.
3. Goodwill. An intangible assets that is not separately identifiable: Everything else (the plug).

#### Investments

Fair value vs. historical cost accounting



#### Passive Investments

HTM: Hold to maturity

AFS: Available for sale

TRD: Trading

	B/S Effect	I/S Effect
HTM (debt)	no	
AFS (debt & equity)	yes	no
TRD (debt & equity)	yes	yes

Changes in market value affect the balance sheet for AFS and TRD securities. Changes in market value affect income statement only for TRD securities.

**HTM Example:** (A) Purchase 100 par bonds with face value of \$10. This is a 10% stake.

(B) A year later, bonds are trading at \$15 each. Trek Company does not sell.

(C) The following year, the bonds issue a coupon payment totaling \$100.

(D) At maturity, the bonds are trading at \$10 each. Trek Company receives back principal in cash.

Event	Cash	Inv	RE	OCI
(A)	-1000	1000		
(B)				
(C)	100		100	
(D)	1000	-1000		

**TRD Example:** (A)-(C) same as previous example  
(D) The following day, bonds are trading at \$13 each. Trek Company sells all of their bonds for cash.

Event	Cash	Inv	RE	OCI
(A)	-1000	1000		
(B)		500	500	
(C)	100		100	
(D)	1300	-1500	-200	

Event	Cash	Inv	RE	OCI
(A)	-1000	1000		500
(B)		500		
(C)	100		100	
(D)	1300	-1500	300	-500

- Equity Method**
- Initially record the investment at acquisition cost.
  - Adjust the book value of the investment by the investor's share of dividends and earnings or losses.
  - Record investor's share of investee's profit on the investor's income statements.
  - Dividends received reduce investment; they do not give rise to dividend income.

- Example: On 1/1/2010, Zsa Zsa purchased 1,000 shares of Zoltan common stock for \$15 cash per share. This 1,000 shares represents a 30% interest in Zoltan.
- Zoltan's book value per share is \$10. Zsa Zsa is paying a premium because it believes that Zoltan has unrecorded patents (with a life of 10 years) of \$5 per share.
  - On 6/30, Zsa Zsa received a dividend of \$1 per share on Zoltan common stock.
  - At 12/31/2010 the market price of Zoltan common stock is \$13 per share. (this creates no entry)
  - Zoltan reports its earnings for 2010 as \$20,000.
  - On 12/31/2010 Zsa Zsa amortizes the unrecorded patents (with a life of 10 years) of \$5 per share.
  - On 6/30/2011 Zsa Zsa sells the 1,000 shares of Zoltan common stock for \$17 per share

Dt	Cash	Inv	RE	Event
1/1	-15000	15000		buy@15
6/30	1000	-1000		dividend
12/31		6000	6000	.3 · 20000
12/31		-500	-500	$\frac{5}{10}$ 1000
6/30	17000	-19500	-2500	sell@17

- Take Away**
- Passive investments  $\Rightarrow$  mark-to-market
  - With some but not complete control  $\Rightarrow$  equity method
  - Greater than 50% ownership  $\Rightarrow$  consolidate
  - Whether it is equity or consolidated method makes a big difference on the appearance of the statements. Financial ratios (leverage ratios) will be very different

**Week 6A: Financial Statement Analysis and Ratios**  
**Solvency and Liquidity Ratios**

$Debt/EquityRatio = \frac{TotalLiabilities}{TotalShareholder'sEquity}$

$LeverageRatio = \frac{TotalAssets}{TotalShareholder'sEquity}$

$LeverageRatio = \frac{A}{L} = \frac{L+L}{L} = 1 + Debt/EquityRatio$

$CurrentRatio = \frac{CurrentAssets}{CurrentLiabilities}$

$WorkingCapital = CurrentAssets - CurrentLiabilities$

**Solvency and Liquidity Ratios**

$NetMargin = \frac{NetIncome}{Revenue}$

$GrossMargin = \frac{Revenue - COGS}{Revenue}$

$ROA = \frac{NetIncome}{TotalAssets}$

$ROE = \frac{NetIncome}{Shareholders'Equity}$

**Operating Efficiency**

$AssetTurnover = \frac{Revenue}{TotalAssets}$

$A/RTurnover = \frac{Revenue}{NetAccountsReceivable}$

$InventoryTurnover = \frac{COGS}{Inventory}$

$DaysReceivable = \frac{365}{A/RTurnover}$

**DuPont Decomposition**

$ROE = \frac{NI}{Equity}$

$ROE = \frac{NI}{Equity} \frac{Assets}{Equity} = ROA \cdot Leverage$

$ROE = \frac{NI}{Sales} \frac{Sales}{Assets} \frac{Assets}{Equity}$

$ROE = ProfitMargin \cdot AssetTurnover \cdot Leverage$

**Week 6B: Income Taxes**

$AccountingIncome \neq TaxableIncome$

$TaxExpense \neq CashTaxes$

**Deferred Tax Liability - DTL**

Deferred tax liabilities increase when a timing difference leads to:

$PretaxIncome_{GAAP} > TaxableIncome_{TaxCode}$

Balance sheet equation for cash paid in tax vs tax liability and income tax expense:

Assets =	Liab +	S/E
CashTax	DefTaxLiab	InTaxExp

If a company has a net deferred tax liability on its balance sheet, cash taxes in the future will be higher than future tax expense.

**Deferred Tax Assets - DTA**

Deferred tax assets increase when a timing difference leads to:

$PretaxIncome_{GAAP} < TaxableIncome_{TaxCode}$

more tax cash early, less cash taxes later.

$DefTaxAsset$  is similar to prepaid expense:

Assets =	Liab +	S/E
CashTax	DefTaxAsset	InTaxExp

**Tax Disclosures**

When the tax rate falls, the DTA (or DTL) shrinks. When a company has net DTL, we can think of this shrinking DTL as a one-time tax benefit which will reduce tax expense.

The DTL will shrink by the ratio of the rates:  $\frac{tax_{new}}{tax_{old}}$

$DTL_{new} = DTL_{old} \frac{tax_{new}}{tax_{old}}$

$\Delta DTL = DTL_{new} - DTL_{old} = (\frac{tax_{new}}{tax_{old}} - 1)DTL_{old}$

Assets =	Liab +	S/E
$\Delta DTL$		$-\Delta DTL$

Similarly when a company has a net DTA:

$\Delta DTA = DTA_{new} - DTA_{old} = (\frac{tax_{new}}{tax_{old}} - 1)DTA_{old}$

Assets =	Liab +	S/E
$\Delta DTA$		$\Delta DTA$

**Effective Tax Rate**

$EffectiveTaxRate = \frac{TaxExpense}{GAAPpretaxIncome}$

$pretaxIncome = NetIncome + TaxExpense$

$EffectiveTaxRate = \frac{TaxExpense}{TaxExpense + NetIncome}$

**DTAs and Valuation Allowance**

Deferred tax assets arise when future taxes payable will be less than future tax expense. DTAs are like "pre-paid" assets. Firms reduce deferred tax assets by creating a valuation allowance, a contra-asset that is similar to the allowance for doubtful accounts.

Example: In 2015, a firm has a \$30,000 deferred tax asset. Suppose instead, at end of 2016, management expects that it will not have enough future income to use the DTA:

Asset	-ContraAsset =	Liab +	S/E
	30000		-30000

**Week 7: Long-Term Debt and Leases**  
**Leases**

	Old Std $\leq 2018$	New Std $\geq 2019$
"Rental" Accounting	Operating Off B/S	Operating On B/S
"Ownership" Accounting	Capital On B/S	Finance On B/S

**Financial Lease**

Both the asset and liability are valued at the PV of lease  $n$  payments  $pmt$  at interest rate  $r$ .

$PV_0 = PV(r, n, pmt)$

When signing the lease:

Assets	Liability	S/E
Lease A	Lease L	
$PV_0$	$PV_0$	

During the lease (t-th period):

Assets		Liability	S/E
Cash	-Acc Depr	Lease L	Ret Earn
$-pmt$		$-(pmt - r \cdot PV_{t-1})$	$-r \cdot PV_{t-1}$
	$\frac{PV_0}{n}$		$-\frac{PV_0}{n}$

$pmt \neq LeaseExpense$ . the rest of the period the logic continues amortizing the lease liability, the lease expense uses the remaining lease balance, the lease asset is depreciated using straight-line.

**Operating Lease**

At the signing of lease is the same as financing leases. During the lease (t-th period):

Assets		Liability	S/E
Cash	Lease A	Lease L	Ret Earn
$-pmt$		$-pmt$	
	$r \cdot PV_{t-1} - pmt$	$r \cdot PV_{t-1}$	$-pmt$

$pmt = LeaseExpense$ . This two line items can be combined. No amortization expense, the lease asset does not have an acc. amort. contra asset, both lease asset and liability amortize over time.

**Week 8: Shareholders' Equity and Earnings Per Share**

**Earnings Per Share**

$BasicEPS = \frac{NI_{availableToCommonShareholders}}{WeightedAverageSharesOutstanding}$

$Numerator = NI - NI_{attributableto noncontrolling interest} - PreferredDividends$

$DilutedEPS = \frac{NI_{availableToCommonShareholders} + Addbacks}{WeightedAverageSharesOutstanding + ConvertibleShares}$

Addbacks in the numerator include dividends paid to preferred shareholders and after-tax interest paid to convertible debt holders. Diluted shares include convertible instruments and stock option exercises. Assume all convertible instruments convert to common stock. Stock option exercises require more calculations.