Week 2: Revenue Recognition; Allowance Accounting

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
+ **A**dditions
- **S**ubstractions
= **E**nding Balance
Example:

Beginning balance (e.g. ADA - allowance for doutful accounts)
+ **A**dditions (e.g. bad debt expense a.k.a. provision charged to income statement)
- **S**ubstractions (e.g. write-offs a.k.a. amount deemed uncollectible)
= **E**nding 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**:Acconts 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 $\Longrightarrow$ LIFO for financial reporting FIFO for tax purposes $\Longrightarrow$ 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)

$$LIFOReserve = EndingInv_{FIFO} - EndingInv_{LIFO}$$
$$EndingInv_{FIFO} = EndingInv_{LIFO} + LIFOReserve$$

Derivation of adjustment LIFO to FIFO:

(1): $EndInv_{FIFO} = BegInv_{FIFO} + Additions - COGS_{FIFO}$
(2): $EndInv_{LIFO} = BegInv_{LIFO} + Additions - COGS_{LIFO}$
(1)-(2):

$$EndInv_{FIFO} - EndInv_{LIFO} = BegInv_{FIFO} - BegInv_{LIFO} - COGS_{FIFO} - -COGS_{LIFO}$$
$$EndLIFOReserve = BegLIFOReserve + COGS_{LIFO} - COGS_{FIFO}$$
$$\Delta LIFOReserve = COGS_{LIFO} - COGS_{FIFO}$$

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

Ratios Involving Intentory

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

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.

$$Acquisitions = EndingPP\&E - BeginningPP\&E + PP\&ESold$$
$$Beginningaccumulateddepreciation + Depreciationexpense - depreciationonsoldassets = Endingaccumulateddepreciation$$

$$Gain(Loss) = Saleprice - BookValue$$
$$BookValue = Purchaseprice - AccumulatedDepreciati$$

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

$$Beg.RetainedEarnings + NetIncome - Dividends(Divs$$
$$End.RetainedEarnings$$

Week 5: Acquisitions / Financial Investments

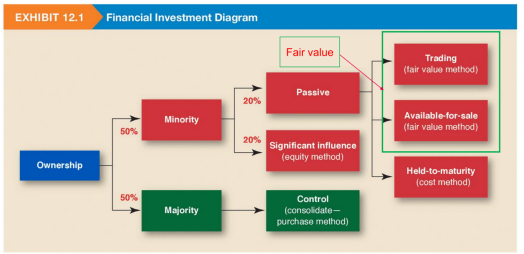
Acquisitions and goodwill

Steps for *allocating the purchase price* :

1. Fair value of tangigle assets and liabilities.
2. *Identifiable* intangile 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	

AFS Example: (A)-(D) the same but AFS accounting.

Event	Cash	Inv	RE	OCI
(A)	-1000	1000		
(B)		500		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	$.3 \cdot 20000$
12/31		-500	-500	$\frac{5}{10}1000$
6/30	17000	-19500	-2500	sell@17

Take Away

- Passive investments $\implies$ mark-to-market
- With some but not complete control $\implies$ equity method
- Greater than 50% ownership $\implies$ 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

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

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

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

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

$$WorkingCapital = CurrentAssets - CurrentLiabilities$$

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

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

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

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

$$ROE = ProfitMargin \cdot AssetTurnover \cdot Leverage$$

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
	ΔDTL	$-\Delta DTL$

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
ΔDTA		ΔDTA

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

Bonds

For financial accounting purposes:

$InterestExpense$ = market rate at the time the bond is issued × net bond payable

$InterestPayable$ = coupon rate × par amount

The difference between interest expense and interest payable is amortized against the bond discount (premium) account. A bond issued at par value (i.e., Coupon Rate = Market Rate). A zero coupon bond (i.e., Coupon Rate = 0%)

Leases

	Old Std ≤ 2018	New Std ≥ 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 Lease A	Liability Lease L	S/E
PV_0	PV_0	

During the lease (t-th period):

Assets Cash	-Acc Depr	Liability Lease L	S/E 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 Cash	Lease A	Liability Lease L	S/E 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

Contributed Capital: Commong Stock

Common stock is divided into Par Value and Additional paid-in capital (APIC). Par value is the stated value on the face of the security. APIC is the difference between capital raised and par value.

Underwriting expenses:

- If $Cash = Par + APIC \implies$ were subtracted from APIC.
- If $Cash < Par + APIC \implies$ capitalized. An asset is created such that $Cash + CapitalizedCosts = Par + APIC$

Earnings Per Share

$$BasicEPS = \frac{NIavailableToCommonShareholders}{WeightedAverageSharesOutstanding}$$

$$Numerator = NI - NIattributabletononcontrollingi$$
$$Preferreddividends$$

$$DilutedEPS = \frac{NIavailableToCommonShareholders+Ad}{WeightedAverageSharesOutstanding+Con}$$

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.