15.516x Financial Accounting

Financial Statement Analysis

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Where ingenuity drives results

Motivation: Financial Statement Analysis / Ratio Analysis

- Has many different uses:
  - Evaluate managers and determine compensation
  - Compare firms of different sizes
  - Generate “quick” measures of firm health/performance
  - Valuation analysis such as that involved in making acquisitions
  - Basis of “trading rules” (e.g., accrual anomaly, book-to-market anomaly)

Example: Comparing Amazon and Walmart

Both companies engage in retail sales but historically take different strategies:

- Amazon began online; is moving into physical stores.
- Walmart began in physical stores; is moving into online.

Amazon has a lower return on equity (ROE) than Walmart.

In this class we will explore why.

Note for our discussion today:

ROE = Net income/Ending Stockholders’ Equity

Balance Sheet - Assets (in millions)

	Walmart 2016	Amazon 2016
Assets:		
Cash	8,705	19,334
Receivables	5,694	8,576
Less: Allowance	(70)	(237)
Inventory	44,469	11,461
Other Current Assets	1,441	6,647
Total Current Assets	60,239	45,781
Property, Plant, & Equipment	176,958	37,230
Less: Accum Dep.	(66,787)	(8,116)
Goodwill	16,695	3,784
Other Assets	12,476	4,723
Total Assets	199,581	83,402

Balance Sheets - Common Size (% of total assets)

	Walmart 2016		Amazon 2016	
Assets:	$	%	$	%
Cash	8,705	4%	19,334	23%
Receivables	5,694	3%	8,576	10%
Less: Allowance	(70)	0%	(237)	0%
Inventory	44,469	22%	11,461	14%
Other Current Assets	1,441	1%	6,647	8%
Total Current Assets	60,239	30%	45,781	55%
Property, Plant, & Equipment	176,958	89%	37,230	45%
Less: Accum Dep.	(66,787)	-33%	(8,116)	-10%
Goodwill	16,695	8%	3,784	5%
Other Assets	12,476	6%	4,723	6%
Total Assets	199,581	100%	83,402	100%

Does inventory accounting affect comparison?

Recall that LIFO/FIFO can lead to big differences in income and assets.

Want to make sure that Amazon and Walmart are comparable.

How to get information?

Search annual report/10-K on “inventories”

Amazon on FIFO

Walmart – mixture, but approximately same as FIFO. Parts of Walmart footnote:

- Walmart uses LIFO method for U.S. inventories.
- Walmart uses FIFO method for international inventories.
- At January 31, 2016 and 2015, our inventories valued at LIFO approximated those inventories as if they were valued at FIFO.

Balance Sheets – Liabilities & SE Common Size (% of total assets)

	Walmart 2016		Amazon 2016	
Liabilities and Stockholder's Equity	$	%	$	%
Accounts Payable	38,487	19%	25,309	30%
Unearned Revenue	-	-	4,768	6%
Other Current Liabilities	26,132	13%	13,739	16%
Total Current Liabilities	64,619	32%	43,816	53%
Long term Debt	38,214	19%	7,694	9%
Other long term Liabilities	13,137	7%	12,607	15%
Stockholders' Equity:				
Contributed Capital	2,122	1%	17,191	21%
Other	(11,597)	-6%	(2,822)	-3%
Retained Earnings	90,021	45%	4,916	6%
Total Stockholder's Equity	80,546	40%	19,285	23%
Noncontrolling Interest	3,065	2%	-	-
Total Liabilities & Stockholders' Equity	199,581	100%	83,402	100%

Ratio Analysis: Agenda

We will consider some basic ratios

- Why are they calculated?
- Who would be interested?
- How would these ratios be affected by various management actions?

Liquidity / Solvency Ratios: Ability to pay bills

Profitability Ratios: Ability to generate profits

Efficiency Ratios: Ability to efficiently manage operations

Note on Ratio Analysis

- On the final, we will give definitions of applicable ratios.
- Will use to test understanding of material (as in the LIFO/FIFO example later).

Testing Your Understanding Liquidity/Solvency (Amazon)

Short-term Liquidity Measures

Working Capital = Current Assets - Current Liabilities

= 45,781 - 43,816

= 1,965

Current ratio = Current Assets / Current Liabilities

= 1.04

If Amazon paid off all its accounts payable with cash, how would that affect:

- its working capital?
  - *it would remain the same*
- its current ratio?
  - *it would increase*

Reference: Changes in Ratios

Ratio Value (Example)	Add to numerator and denominator (Example)	New Ratio vs. Old Ratio (Example)
Greater than 1 (e.g. 2/1 > 1)	Positive (e.g. +1)	Smaller (e.g. 3/2 < 2/1)
Greater than 1 (e.g. 2/1 > 1)	Negative (e.g. –0.5)	Bigger (e.g. 1.5/0.5 > 2/1)
Less than 1 (e.g. 1/2 < 1)	Positive (e.g. +1)	Bigger (e.g. 2/3 > 1/2)
Less than 1 (e.g. 1/2 < 1)	Negative (e.g. –1)	Smaller (e.g. 0/1 < 1/2)

Example:
Effect of paying off A/P if current ratio is 1.04

Ratio Value (Example)	Add to numerator and denominator (Example)	New Ratio vs. Old Ratio (Example)
Greater than 1 (e.g. 2/1 > 1)	Positive (e.g. +1)	Smaller (e.g. 3/2 < 2/1)
Greater than 1 (e.g. 2/1 > 1)	Negative (e.g. –0.5)	Bigger (e.g. 1.5/0.5 > 2/1)
Less than 1 (e.g. 1/2 < 1)	Positive (e.g. +1)	Bigger (e.g. 2/3 > 1/2)
Less than 1 (e.g. 1/2 < 1)	Negative (e.g. –1)	Smaller (e.g. 0/1 < 1/2)

Liquidity / Solvency Ratios (Balance Sheet Ratios)

Long-term / Overall Financial Risk Measures

Debt-Equity Ratio:

Total Liabilities / Total Stockholders' Equity

Associated with bankruptcy risk, but also higher rate of return to equity holders

Also sometimes computed as (Long term debt + Short term debt) / Stockholders' Equity

Alternative: Leverage Ratio:

Total Assets / Total Stockholders' Equity

A/E = (L+E)/E = (1+L/E)

Leverage = 1 plus debt to equity

Liquidity / Solvency Ratios (Other Ratios)

Times interest earned =

Earnings before interest expense and taxes / interest expense

Altman's (1968) Z-score for bankruptcy prediction (not on exam)

$$\text{Z-score} = 1.2 \times \frac{\text{Working capital}}{\text{Total assets}} + 1.4 \times \frac{\text{Retained earnings}}{\text{Total assets}} + 3.3 \times \frac{\text{EBIT}}{\text{Total assets}} + 0.6 \times \frac{\text{Market value of equity}}{\text{Total liabilities}} + 0.99 \times \frac{\text{Sales}}{\text{Total assets}}$$

Combines five liquidity / solvency / profitability / efficiency ratios into a "score."

Z < 1.23 indicates high probability of bankruptcy.

Testing Your Understanding

Walmart Debt-Equity ratio = Total Liabilities / Total S/E

= 115,970 / 80,546 = 1.48

Amazon Debt-Equity ratio = Total Liabilities / Total S/E

= 64,117 / 19,285 = 3.32

Walmart Leverage ratio = Total Assets / Total S/E

= 199,581 / 80,546 = 2.48

Amazon Leverage ratio = Total Assets / Total S/E

= 83,402 / 19,285 = 4.32

Testing Your Understanding

Amazon Debt-Equity Ratio = Total Liabilities / Total Stockholders' Equity

= 64,117 / 19,285 = 3.32

Would the Debt-Equity Ratio increase, decrease or remain unchanged with each of these actions in 2016?

Amazon pays more dividends in 2016

D/E would increase

Amazon records more bad debt expense in 2016

D/E would increase

Amazon pays off all its accounts payable with cash in 2016

D/E would decrease

Amazon issues $1 billion of long-term debt and $1 billion of stock in 2016

D/E would decrease

Income Statements - Common Size (% of sales)

	Walmart 2016		Amazon 2016	
	$	%	$	%
Total Revenue	482,130	100%	135,987	100%
Cost of Sales	360,984	75%	88,265	65%
Selling General & Admin	87,587	18%	43,369	32%
Interest Expense	2,467	1%	384	0%
Other expenses	9,454	2%	167	0%
Operating Expenses	460,492	96%	131,801	97%
Other income	-	0%	90	0%
Income before taxes	21,638	4%	3,978	3%
Income Tax expense	6,558	1%	1,425	1%
Noncontrolling Interest	386	0%	-	-
Net Income	14,694	3%	2,371	2%

Profitability Ratios (Income Statement Ratios)

<u>Margins</u>

Net margin percentage: The ratio of net profits to revenues

(Often simply called profit margin)

<u>Other margins</u>

Gross margin percentage: The ratio of gross profits to revenues

Operating margin percentage: The ratio of operating profits to revenues

Profitability Ratios: Income Statement

Margins

Amazon Net Margin percentage: Net income/revenues

2,371 / 135,987 = 1.74 %

Walmart Net Margin percentage: Net income/revenues

14,694 / 482,130 = 3.04 %

Return on Investment
(Income as a % of Investment)

Return to all investors

Return on Assets (ROA) = Income / Total Assets

Which Income?

- We will focus on Net Income
- Others: Earnings without Interest Expense, EBITDA, etc.

Return to stockholders

Return on equity (ROE) = Net Income / Stockholders’ Equity

Which Investment Level?

- We will focus on Ending Stockholders’ Equity (more data available)
- Why is Average Stockholders’ Equity better?

Profitability Ratios

Assume we scale by ending assets or ending equity:

Walmart ROA = Net Income / Ending Total Assets

14,694 / 199,581 = 7.4%

Amazon ROA = Net Income / Ending Total Assets

2,371 / 83,402 = 2.8%

Walmart ROE = Net Income / Ending Total SE

14,694 / 80,546 = 18.2%

Note:
Net income to Walmart stockholders / Walmart stockholders' equity

Amazon ROE = Net Income / Ending Total SE

2,371 / 19,285 = 12.3%

Testing Your Understanding Profitability Ratios

Amazon ROE = Net Income / Ending Total SE
= 2,371 / 19,285 = 12.3%

In 2016, how would Amazon's ROE change if:

- On 12/31/2016, Amazon issued stock for cash
  - *ROE would decrease*
- On 12/31/2016, Amazon pays a cash dividend
  - *ROE would increase*
- On 12/31/2016, all of Amazon's customers paid off their receivables
  - *ROE is unaffected*
- On 12/31/2016, Amazon realizes that it has an error. It completely neglected to make the entries for an additional $100,000 in accrued compensation.
  - *ROE would decrease*
- On 12/31/2016, Amazon increases its expense on estimated returns.
  - *ROE would decrease*

Efficiency Ratios

Operating Efficiency

Asset Turnover = Revenue / Total Assets

(How fast are you generating revenue from your assets?)

A/R Turnover = Revenue / Net Accounts Receivable

(Measures how quickly you collect cash on your credit sales. If company has lots of credit revenue, but very low receivables, implies you collect cash on your credit revenues quickly)

Inventory Turnover = Cost of Goods Sold / Inventory

(How quickly do you sell your inventory? If company has lots of COGS, but very low inventory, implies turn your inventory around pretty quickly)

Review / Testing Your Understanding

Assume that Amazon uses the definition

Inventory Turnover = COGS / Ending Inventory = 88,265 / 11,461 = 7.70

Amazon uses FIFO. If Amazon switched to LIFO, would inventory turnover be higher or lower?

Assume that:

- Amazon's 2016 LIFO reserve is greater that 0, and
- Amazon's 2016 LIFO reserve is greater than its 2015 LIFO reserve.

COGS under LIFO:

Larger

Ending Inventory under LIFO:

Smaller

Inventory Turnover under LIFO:

Larger

Efficiency Ratios

	Amazon:	Walmart:
Asset turnover:	$\frac{135{,}987}{83{,}402} = 1.63$	$\frac{482{,}130}{199{,}581} = 2.42$
Net A/R turnover:	$\frac{135{,}987}{8{,}339} = 16.31$	$\frac{482{,}130}{5{,}624} = 85.73$
Days Receivable:	$\frac{365}{16.31} = 22.4$ days	$\frac{365}{85.73} = 4.3$ days

"Dupont" Analysis
(Understanding the Drivers of Return on Equity)

$$\text{ROE} = \frac{\text{NI}}{\text{SE}} = \frac{\text{Net Income}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{SE}}$$

Operating Performance

Return on Assets

Leverage

(Assets to Equity ratio)

"Dupont" Analysis
(Understanding the Drivers of Return on Equity)

$$\text{ROE} = \frac{\text{NI}}{\text{SE}} = \frac{\text{Net Income}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{SE}}$$

Operating Performance

Return on Assets

Leverage

(Assets to Equity ratio)

$$\frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}}$$

Profit Margin

Asset Turnover

Completing the analysis: What explains ROE differences?

NI/EQUITY	=	NI/SALES	*	SALES/ASSETS	*	ASSETS/EQUITY
"ROE"	=	"Profit margin"		"Asset Turnover"		"Leverage"

ROE for Amazon:

2,371 / 19,285	=	2,371 / 135,987	*	135,987 / 83,402	*	83,402 / 19,285
12.3%		0.017	*	1.63	*	4.32

ROE for Walmart:

14,694 / 80,546	=	14,694 / 482,130	*	482,130 / 199,581	*	199,581 / 80,546
18.2%	=	0.03	*	2.42	*	2.48

What is an easy thing to do if Amazon wished to increase its ROE?

If it paid a cash dividend, asset turnover and leverage would both increase.
The reduction in interest income would slightly reduce NI, but overall ROE would increase.

Takeaway Slide

Introduced financial statement analysis and ratio analysis.

Important uses include:

- Determining compensation (including yours!)
- Comparing companies and aiding stock selection
- Valuing companies

Dupont model is a powerful way to understand drivers of profitability

Caveat:
Effect of leverage change on ROE

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Suppose Walmart doubled its leverage while holding assets constant.
Would its ROA and ROE double?

NI/EQUITY	=	NI/SALES	*	SALES/ASSETS	*	ASSETS/EQUITY
"ROE"	=	"Profit margin"		"Asset Turnover"		"Leverage"

Current ROE for Walmart:

17.2%	=	0.03	*	2.42	*	2.48

ROE for Walmart with 2X leverage:

?	=	?	*	2.42	*	2 X 2.48

Does Profit margin change?

Assume asset turnover does not change, since assets are held constant.

Yes, assuming the additional leverage brings more interest expense.

A “better” measure of ROA

Return on Assets (ROA) = Earnings without Interest Expense / Total Assets

Earnings without Interest Expense (EWI) = Net income + [Interest expense X (1-statutory tax rate)]

Advantages:

Reflects idea that changes in leverage affect interest expense (after taxes); theoretically better; concept will be used in your finance classes to compute the value of unlevered firm.

Disadvantages:

More costly to compute; tax effects can be complicated as we will discuss next week

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Accounting for Income Taxes

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Accounting for Income Taxes

Objectives:

- Understand how financial statements reflect taxes paid and taxes owed
- Interpret income tax disclosures
- Understand the effects of events on income taxes
  - Tax law changes
  - Valuation allowances

Motivation / Big Picture

- Taxes are a significant use of cash for firms and individuals.
  - Econ: To maximize profits, minimize costs.

- As a manager (individual), important to understand impact of taxes on decisions:
  - Asset purchase and sale
  - Financing decisions
  - Location decisions

- As investor, interpret financial statements to understand future cash flows related to tax.

Accounting (Book) Income vs. Taxable Income
Intuition based on Marketable Securities

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Example: Eva owns 100 Attila bonds. The price increases by $10. Eva does not sell. Accounting is trading securities. Assume a tax rate of 35%.

Based on GAAP:

- What is Eva's accounting (book) income?

  $1,000

- What is Eva's tax expense?

  $350

Based on IRS tax code:

- What is Eva's taxable income?

  $0

- What is Eva's current tax payable?

  $0

Eva has a deferred tax liability of $350. Tax will have to be paid to the IRS when the bonds are sold.

Accounting Income vs. Taxable Income

Companies do two types of accounting:

1. one for reporting to their shareholders, and
2. one for reporting to tax authorities

1. Financial accounting reports to investors and other stakeholders
   - Accounting/Book Income
   - Uses accrual accounting

   Relevant

2. Tax returns report to tax authorities
   - Taxable Income
   - More like cash accounting

   Reliable

Key point: If you forget everything else, remember this

- Accounting income ≠ Taxable income
- Tax expense ≠ Cash taxes
- Cash taxes is the cash outflows owed to the US tax authorities (some of these taxes may be paid a few months later).
- Tax expense on the income statement is an accrual number just like every other expense on the income statement.
  - Accrual:
    - Estimate of future cash outflows
    - Matched to income when it is earned

Temporary Differences between GAAP and Tax Code

- Items recognized by GAAP and by the tax code – but the items are recognized in different periods.

Examples:

- Depreciation expense on fixed assets
  - GAAP => straight-line
  - Tax code => accelerated
- Deferred revenue
  - GAAP => income when earned
  - Tax code => income when cash received

Deferred Tax Liability: Summary

Deferred tax liabilities arise/increase when a timing difference leads to:

Pretax Income > Taxable income

(GAAP) (Tax code)

Example: Depreciation expense is lower in early years under GAAP (straight-line) than for tax (accelerated).

Less cash taxes early; more cash taxes later.

Illustration of Timing Difference: Depreciation

Cooke Company bought a $100,000 asset in the beginning of 2010.

	Financial Reporting	**Tax Reporting**
Asset Life	2 years	1 year
Depreciation Rate	Straight Line	100%, 0%
Salvage Value	$0	$0

What is Cooke's depreciation expense for financial reporting purposes?

$50,000 in both 2010 and 2011

For tax purposes?

$100,000 in 2010, $0 in 2011

Deferred Tax Liability: Illustration Depreciation – 2010

Again, assume all taxes paid in cash. There may be a small amount of taxes payable; but will be paid soon in cash.

Suppose Cooke has income before depreciation and taxes of $100,000 for both financial and tax reporting in both 2010 and 2011. Tax rate is 35%.

100K "IBDT" – 50K depreciation = 50K NI before taxes

	Financial Reporting	Tax Reporting
2010 NI before taxes	50,000	0 (=100K "IBDT" – 100K dep. exp)
Cash		0 (there is no income tax)
Tax Expense	17,500	

50K NI before taxes * 0.35 tax rate

BSE Equation Entry

	Assets	=	Liab	+	S/E
	Cash		Def Tax Liab		R/E
2010	0		17,500		–17,500 (exp)

Deferred tax liability is an accrual that estimates taxes expected to be paid in future. It is similar to a long-term payable. It occurs because tax expense is matched to revenue.

Deferred Tax Liability: Illustration
What Happens in 2011?

Suppose Cooke has income before depreciation and taxes of $100,000 for both financial and tax reporting in both 2010 and 2011. Tax rate is 35%.

Again in 2011, 100K inc. – 50K dep. = 50K NI before taxes

	Financial Reporting	Tax Reporting
2011 NI before taxes	50,000	100,000 (=100 "IBDT" – 0 dep. exp)
Cash		35,000 (=100 income * 0.35 tax rate)
Tax Expense	17,500	

50K NI before taxes * 0.35 tax rate

BSE Equation Entry

	Assets	**=**	**Liab**	**+**	**S/E**
	Cash		Def Tax Liab		R/E
2010	0		17,500		–17,500 (exp)
2011	–35,000		–17,500		–17,500 (exp)

A deferred tax liability of $17,500 was created in 2010 (like an accrued "payable").
The reversal occurs in 2011 when the firm pays cash taxes.

Example: $200K equipment purchase fully deductible; depreciated over 4 years

Year	Tax Reporting: Full Deduction	Financial Accounting Reporting: Straight-Line Depreciation	Tax vs. Book Difference	Cumulative Tax-Book Difference
1	$200,000	$50,000	$150,000	$150,000
2	0	50,000	(50,000)	100,000
3	0	50,000	(50,000)	50,000
4	0	50,000	(50,000)	0

The deferred tax liability schedule would be as follows:

Year	Cumulative Tax-Book Difference	Tax Rate	Deferred Tax Liability, End of Year	Deferred Tax Expense
1	$150,000	25%	$37,500	$37,500
2	100,000	25%	25,000	(12,500)
3	50,000	25%	12,500	(12,500)
4	0	25%	0	(12,500)

Tax Disclosures: Goldman Sachs Income Tax footnote 2016

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BSE Equation Entry for 2016:

Assets	**=**	**Liab**	**+**	**S/E**
Cash		Def Tax Liab		R/E
–2,355		551		–2,906

Amount currently payable in cash to tax authorities

$ in millions	**2016**	2015	2014
	Year Ended December		
Current taxes			
U.S. federal	**$1,032**	$1,116	$1,908
State and local	**139**	(12)	576
Non-U.S.	**1,184**	1,166	901
Total current tax expense	**2,355**	2,270	3,385
Deferred taxes			
U.S. federal	**399**	397	190
State and local	**51**	62	38
Non-U.S.	**101**	(34)	267
Total deferred tax expense	**551**	425	495
Provision for taxes	**$2,906**	$2,695	$3,880

Income tax expense

Deferred Tax Asset: Summary

Deferred tax assets arise/increase when a timing difference leads to:

Pretax Income < Taxable income

(GAAP) (Tax code)

Example: If deferred revenue is received, income is lower in early years under GAAP (when earned) than for tax (when received).

More cash taxes early; less cash taxes later.

Deferred Tax Asset: Illustration
A Company that rents property out – 2010

Suppose that total rent collected in 2010 was $100,000, of which $50,000 was paid in advance for 2011.

Tax rate is 35%. (Ignore other expense)

Recognized first half of $100K collected for two year rental

	Financial Reporting	Tax Reporting
2010 NI before taxes	50,000	100,000 (100K cash inflow)
Cash		35,000 (100K * 0.35 tax rate)
Tax Expense	17,500	

50K NI before taxes * 0.35 tax rate

BSE Equation Entry

	Assets		**=**	**Liab**	**+**	**S/E**
	Cash	Def Tax Asset				R/E
2010	–35,000	17,500				–17,500 (exp)

Note: Similar to prepaid expense.

Deferred Tax Asset: Illustration
What Happens in 2011?

Suppose that total rent collected in 2010 was $100,000, of which $50,000 was paid in advance for 2011.

Tax rate is 35%. (Ignore other expense)

Recognized second half of 100K collected for two year rental

	Financial Reporting	Tax Reporting
2011 NI before taxes	50,000	0 (no new cash inflow)
Cash		0 (there is no income to tax)
Tax Expense	17,500	

50K NI before taxes * 0.35 tax rate

BSE Equation Entry

	Assets		=	Liab	+	S/E
	Cash	Def Tax Asset				R/E
2010	–35,000	17,500				–17,500 (exp)
2011	0	–17,500				–17,500 (exp)

A deferred tax asset of $17.5K was created in 2010. Reversal occurs in 2011 when financial reporting revenue is recognized.

TAX DISCLOSURES: GOLDMAN SACHS INCOME TAX FOOTNOTE 2016

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Intuition: Deferred compensation is expensed when granted, but only is tax-deductible when employee receives.

$ in millions	As of December 2016	2015
Deferred tax assets		
Compensation and benefits	**$2,461**	$2,744
ASC 740 asset related to unrecognized tax benefits	**231**	197
Non-U.S. operations	**967**	1,200
Net operating losses	**427**	426
Occupancy-related	**100**	80
Other comprehensive income-related	**757**	521
Other, net	**394**	836
Subtotal	**5,337**	6,004
Valuation allowance	**(115)**	(73)
Total deferred tax assets	**$5,222**	$5,931
Depreciation and amortization	**$1,200**	$1,254
Unrealized gains	**342**	853
Total deferred tax liabilities	**$1,542**	$2,107
Net deferred tax assets	**$3,680**	$3,824

Intuition: Straight-line depreciation for book; accelerated depreciation for tax.

Deferred compensation DT Asset

Very simplified example 1: Suppose we promise to pay an employee $1,000K in 3 years. We deduct this when we pay it; for financial reporting we expense now. Assume 30% tax rate.

Year	Tax Deduction	Accounting Expense	Tax vs. Book Difference	Deferred Tax Asset (30%)
1	0	1,000	-1,000	300
2	0	0	0	300
3	1,000	0	1,000	0

BSE in year 3:

Cash	**DTA**
300	-300

Deferred Tax Liability Disclosures: Goldman Sachs

Depreciation and amortization	**$1,200**	$1,254
Unrealized gains	**342**	853
Total deferred tax liabilities	**$1,542**	$2,107

Focusing on Depreciation and amortization – What does 1,200 mean?

Deferred tax liability of $1,200 million related to Depreciation and amortization.

To date, tax depreciation is higher than GAAP depreciation. Therefore, total taxable income is lower than total GAAP income. In future, when this reverses, Goldman will pay more tax.

To date, how much higher is total tax depreciation than GAAP depreciation (assume 35% tax rate)?

1,200 / 0.35 = $3,428 million over life of firm

Deferred Tax Liability Disclosures: Goldman Sachs

$ in millions	As of December 2016	2015
Total deferred tax assets	**$5,222**	$5,931
Total deferred tax liabilities	**$1,542**	$2,107
Net deferred tax assets	**$3,680**	$3,824

In the future, how much higher will total GAAP income be than total taxable income (assume 35% tax rate)?

Net deferred tax assets are $3,680 million.

3,680 / 0.35 = $10,514 million. Total GAAP income will be $10,514 million higher than total taxable income.

What would Net deferred tax assets be if a 21% tax rate were instead assumed?

$10,514 million x .21 = $2,208 million

Deferred Tax Liability Disclosures: Goldman Sachs

$ in millions	As of December 2016	2015
Total deferred tax assets	**$5,222**	$5,931
Total deferred tax liabilities	**$1,542**	$2,107
Net deferred tax assets	**$3,680**	$3,824

What would Net deferred tax assets be if a 21% tax rate were instead assumed?

$10,514 million x .21 = $2,208 million (a reduction of 1,472 million).

What would the income effect be on Goldman Sachs as of 12/2016 if the tax rate were reduced from 35% to 21%?

BSE Equation Entry

	Assets		**=**	**Liab**	**+**	**S/E**
	Cash	Def Tax Asset				R/E
2016	$0	-$1,472				-$1,472 (tax expense)

Effective Tax Rate

Effective Tax Rate = Tax Expense / GAAP pre-tax income

The effective tax rate can differ from the US statutory rate (35% in 2017). Examples of why:

- Items recognized by GAAP but not the tax code ("permanent differences"):
  - Interest received on tax-exempt bonds
  - Fines paid to government and associated legal expenses
- Differences in tax rates on foreign earnings
- Revaluation of DTA / DTL due to tax rate changes
- Stock compensation

Tax Disclosures: Goldman Sachs Income Tax

in millions, except per share amounts	Year Ended December 2016	2015	2014
Revenues			
Investment banking	**$ 6,273**	$ 7,027	$ 6,464
Investment management	**5,407**	5,868	5,748
Commissions and fees	**3,208**	3,320	3,316
Market making	**9,933**	9,523	8,365
Other principal transactions	**3,200**	5,018	6,588
Total non-interest revenues	**28,021**	30,756	30,481
Interest income	**9,691**	8,452	9,604
Interest expense	**7,104**	5,388	5,557
Net interest income	**2,587**	3,064	4,047
Net revenues, including net interest income	**30,608**	33,820	34,528
Operating expenses			
Compensation and benefits	**11,647**	12,678	12,691
Total non-compensation expenses	**8,657**	12,364	9,480
Total operating expenses	**20,304**	25,042	22,171
Pre-tax earnings	**10,304**	8,778	12,357
Provision for taxes	**2,906**	2,695	3,880
Net earnings	**7,398**	6,083	8,477

Effective tax rate = 2,906 / 10,304 = 28.2% < 35%. Why?

Tax Disclosures: Goldman Sachs Income Tax footnote 2016

U.S. tax rate = 35%

	Year Ended December		
	2016	2015	2014
U.S. federal statutory income tax rate	**35.0%**	35.0%	35.0%
State and local taxes, net of U.S. federal income tax effects	**0.9%**	0.3%	3.2%
Tax credits	**(2.0)%**	(1.7)%	(1.1)%
Non-U.S. operations	**(6.7)%**	(12.1)%	(5.8)%
Tax-exempt income, including dividends	**(0.3)%**	(0.7)%	(0.3)%
Non-deductible legal expenses	**1.0%**	10.2%	—
Other	**0.3%**	(0.3)%	0.4%
Effective income tax rate	**28.2%**	30.7%	31.4%

Effective tax rate calculated on prior slide

Tax Disclosures: Goldman Sachs Income Tax footnote 2016

MANAGEMENT SLOAN SCHOOL

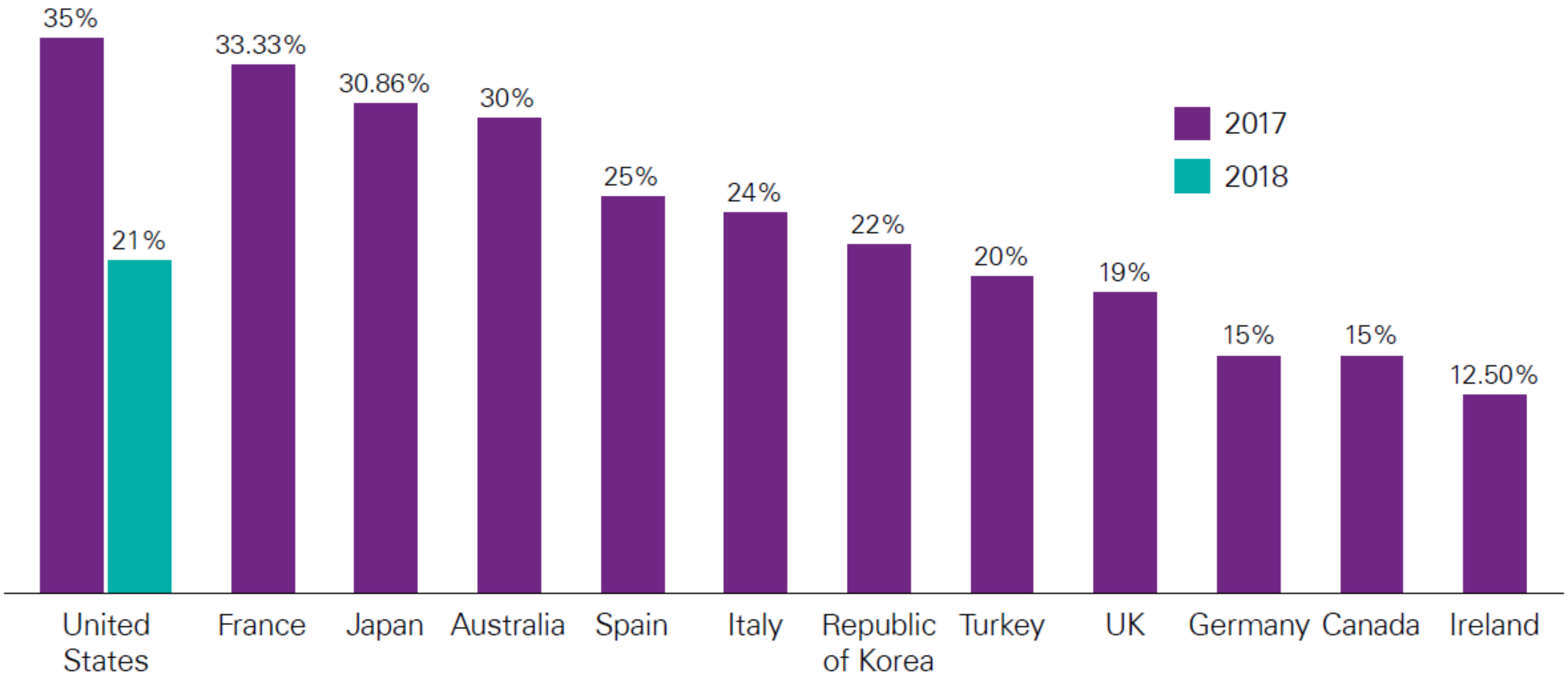
	Year Ended December		
	2016	2015	2014
U.S. federal statutory income tax rate	**35.0%**	35.0%	35.0%
State and local taxes, net of U.S. federal income tax effects	**0.9%**	0.3%	3.2%
Tax credits	**(2.0)%**	(1.7)%	(1.1)%
Non-U.S. operations	**(6.7)%**	(12.1)%	(5.8)%
Tax-exempt income, including dividends	**(0.3)%**	(0.7)%	(0.3)%
Non-deductible legal expenses	**1.0%**	10.2%	—
Other	**0.3%**	(0.3)%	0.4%
Effective income tax rate	**28.2%**	30.7%	31.4%

Differences in tax rates on foreign earnings

Permanent difference: Settlement with US related to alleged mortgage-backed securities fraud

U.S. and other OECD statutory corporate tax rates

Corporate income tax rates* in select OECD countries



*Basic, top corporate income tax rate levied by central government. Local level taxes and surtaxes are not included and can be substantial for some countries (e.g., the 2017 German rate could vary between 22.83-36.83% with local trade tax rates).

Source: KPMG International, Tax Rates Online, 2017 data

Corporate Tax Changes Enacted 12/2017

Lowered US corporate tax rate from 35% to 21% in 2018

Previously earned foreign income was "deemed repatriated" and taxable

- Under old tax law, corporations did not pay US tax on foreign income until money was brought back to US ("repatriated")

Tax Disclosures: Goldman Sachs Income Tax Footnote 2017

	Year Ended December		
	2017	2016	2015
U.S. federal statutory income tax rate	**35.0%**	35.0%	35.0%
State and local taxes, net of U.S. federal income tax effects	**1.5%**	0.9%	0.3%
Non-U.S. operations	**(6.3)%**	(6.7)%	(12.1)%
Tax credits	**(2.1)%**	(2.0)%	(1.7)%
Tax-exempt income, including dividends	**(0.2)%**	(0.3)%	(0.7)%
Tax Legislation — repatriation tax	**29.8%**	–	–
Tax Legislation — remeasurement of deferred tax assets	**9.7%**	–	–
Non-deductible legal expenses	**0.5%**	1.0%	10.2%
Other	**(6.4)%**	0.3%	(0.3)%
Effective income tax rate	**61.5%**	28.2%	30.7%

Effective tax rate doubles in 2017!

Previously earned foreign income was "deemed repatriated" and taxable

Tax rate change lowers value of net DTA and increases tax expense (as illustrated above).

Net Operating Losses (NOL) and Deferred Tax Assets

If a firm incurs a loss for tax purposes:

- The firm does not pay negative taxes (get a refund) due to the loss.
- Instead, the firm can carry the loss forward and offset future taxable income

Net operating loss (NOL) carryforwards or “Loss Carry Forwards” create a deferred tax **asset**

- Intuition: Firm will pay less cash taxes in future.

NOL Carryforward Example

XYZ has book and tax income of -$100,000 in 2015. It carries this tax loss forward. Tax rate is 30%.

	Financial reporting	**Tax reporting**
2015 NI before taxes	-100,000	-100,000
Cash Taxes		0
Tax Expense (Benefit)	-30,000	

<u>BSE Equation Entry</u>

	Assets		=	**Liab**	+	**S/E**
	Cash	Def Tax Asset				R/E
2015	0	30,000				30,000 (benefit)

Use of NOL Carryforward Example

XYZ has book and tax income (before carryforwards) of $100,000 in 2016. After it uses its $100,000 tax loss carryforward, tax income is $0. Tax rate is 30%.

	Financial reporting	**Tax reporting**
2016 NI before taxes	100,000	100,000 - 100,000 = 0
Cash Taxes		0
Tax Expense	30,000	

BSE Equation Entry

	Assets		=	**Liab**	+	**S/E**
	Cash	Def Tax Asset				R/E
2015	0	30,000				30,000 (benefit)
2016	0	-30,000				-30,000

DTAs and Valuation Allowance

- Deferred tax assets arise when future taxes payable will be less than future tax expense, as in prior example and as with NOLs.
  - DTAs are like "pre-paid" assets.

- What happens if a firm does not expect high future income?
  - There will not be future income to use the DTA; DTA is not "realizable"

- If a DTA is not "realizable," then it should be reduced. An analogy is accounts receivable that are not expected to be collected.
  - Firms reduce deferred tax assets by creating a valuation allowance, a contra-asset that is similar to the allowance for doubtful accounts.

Deferred Tax Asset Valuation Allowance: Illustration

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.

<u>BSE Equation Entry</u>

	Assets		=	Liab	+	S/E
	DTA	- Valuation Allowance (XA)				R/E
2016		30,000				-30,000 (tax expense)

Note: the valuation allowance is similar to allowance for doubtful accounts.

TAX DISCLOSURES: GOLDMAN SACHS INCOME TAX FOOTNOTE 2016

MIT MANAGEMENT SLOAN SCHOOL

	As of December	
$ in millions	**2016**	2015
Deferred tax assets		
Compensation and benefits	**$2,461**	$2,744
ASC 740 asset related to unrecognized tax benefits	**231**	197
Non-U.S. operations	**967**	1,200
Net operating losses	**427**	426
Occupancy-related	**100**	80
Other comprehensive income-related	**757**	521
Other, net	**394**	836
Subtotal	**5,337**	6,004
Valuation allowance	**(115)**	(73)
Total deferred tax assets	**$5,222**	$5,931
Depreciation and amortization	**$1,200**	$1,254
Unrealized gains	**342**	853
Total deferred tax liabilities	**$1,542**	$2,107
Net deferred tax assets	**$3,680**	$3,824

Citigroup and Deferred Taxes (CNBC.com 10/30/2009)

- Citigroup may have to write down about $10 billion in deferred tax assets in the fourth-quarter, according to CLSA banking analyst Michael Mayo, sending the shares down over 5 percent.

  Question: Why did share prices fall?

  Hint: when would a firm not be able to use deferred tax assets?

  - The DTA is valuable only if future income is positive. When a company writes down a DTA, it is because expects low future income.
  - This is a rare case when the accounting system signals low future income.

- Deferred tax assets can be used to offset future (taxable) gains. However, if over time, a company does not have gains to offset, the value of the deferred tax assets must be written down.

Stock compensation DT Asset (not on exam)

Very simplified example 2: Now suppose we have given the employee stock with a grant date expected value of $1,000K in 3 years. For financial reporting we expense now. But value turns out to be $10,000K, and we deduct $10,000K when employee recognizes income.

Year	Tax Deduction	Accounting Expense	Tax vs. Book Difference	Deferred Tax Asset (30%)
1	0	1,000	-1,000	300
2	0	0	0	300
3	10,000	0	10,000	0

BSE in year 3 (before 2017):

Cash	**DTA**	**CC**
3,000	-300	2,700

BSE in year 3 (2017 and after):

Cash	**DTA**	**RE**
3,000	-300	2,700 (tax benefit)

Joe Biden's Twitter fight with Amazon perfectly sums up the battle over America's new tax code (6/14/19)

Amazon News @amazonnews

We've paid $2.6B in corporate taxes since 2016. We pay every penny we owe. Congress designed tax laws to encourage companies to reinvest in the American economy. We have $200B in investments since 2011 & 300K US jobs. Assume VP Biden's complaint is w/ the tax code, not Amazon.

> **Joe Biden** @JoeBiden
>
> I have nothing against Amazon, but no company pulling in billions of dollars of profits should pay a lower tax rate than firefighters and teachers. We need to reward work, not just wealth. nytimes.com/2019/04/29/us/...

25.3K 5:55 PM - Jun 13, 2019

9,385 people are talking about this

Source: https://www.cnbc.com/2019/06/14/joe-biden-fight-with-amazon-sums-up-battle-over-corporate-taxes.html

Amazon Tax Footnote 2018

	Year Ended December 31,		
	2016	2017	2018
Income taxes computed at the federal statutory rate	35.0%	35.0%	21.0%
Effect of:			
Tax impact of foreign earnings	-1.8%	31.0%	1.1%
State taxes, net of federal benefits	2.8%	3.0%	2.3%
Tax credits	-3.1%	-5.8%	-3.7%
Stock-based compensation (2)	4.9%	-24.1%	-9.6%
Domestic production activities deduction	-2.4%	0.0%	0.0%
2017 Impact of U.S. Tax Act	0.0%	-20.7%	-1.4%
Other, net	1.2%	1.9%	1.0%
Total	36.6%	20.2%	10.6%

The big change in ETR from 2016 to 2017 is driven by the change in accounting for tax benefit from stock compensation (not on exam).

Apple's Tax Avoidance Illustrates Gap Between Law and Economics (WSJ 9/7/16)

American companies like Apple Inc. aren't just world-class innovators in personal technology and marketing.

They are also, it turns out, world-class innovators in tax avoidance.

Apple's Tax Strategy Aims at Low-Tax States and Nations (NYT 4/28/12)

Apple's headquarters are in California. By putting an office in Nevada, just 200 miles away, Apple sidesteps state income taxes.

California's corporate tax rate is 8.84 percent. Nevada's? Zero.

Accounting for Income Taxes: Take-Away Slide

- We discussed how financial statements reflect taxes paid and taxes owed

- We interpreted income tax disclosures

- We examined the effects of events on income taxes
  - Tax law changes
  - Valuation allowances