October 31, 2019

No Contest: Can Financial Reporting Standards Achieve Comparability in the Face of Financial Engineering

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No Contest: Can Financial Reporting Standards Achieve Comparability in the Face of Financial Engineering?[1]

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Abstract

By comparing the accounting of 10 transaction methods designed to achieve the same net economic effect for a firm borrowing a given amount of money, we show that these 10 methods, under the current financial reporting standards, have markedly different consequences for a firm's financial reporting. It follows that agents (e.g., managers, auditors, shareholders, and regulators, etc.) with different interests in financial reports may employ different methods of achieving the same net economic result. Accounting regulators can only specify how preparers should account for a given transaction; regulators have little control over the transactions and instruments firms choose to use. The broad range of financial reporting consequences of a given economic transaction, with regard to financial engineering, points to the difficulty—and even virtual impossibility—of regulators achieving comparability and consistency among firms' financial reports. Despite attempts at regulation and the voluminous GAAP regulations, we reveal that managers remain free to engineer their transactions to publish their firm's desired (or engineered) financial reports since these accounting methods are largely reported inconsistently with no comparability.

Keywords: Financial reporting standards, comparability, financial engineering, regulation

JEL Codes: G23, G28, M48

Draft October 31, 2019

[1] We are grateful to Elizabeth Viloudaki for her editing.

1. Introduction

Quality as applied to financial reporting remains ambiguous. Authoritative attempts by the Financial Accounting Standards Board (FASB) to clarify the parameters of financial report quality usually refers to their comparability and uniformity (FASB Concepts Statement # 8; IASB 2018: 2.23, 2.25). A broader exploration of the meaning of quality suggests other criteria such as social welfare, contract enforcement, statistical properties and other items (see Sunder 2016 for a review).

We report on the results of an investigation of the extent to which the comparability target has been, or might be, achieved in an environment where financial reporting co-habits with financial engineering. We conclude that financial engineering can and has been used to design various currency instruments and transactions to achieve a given net economic result. Even when these engineered methods represent events and transactions identical in their economic substance, the application of the prevailing reporting standards generates extremely varied financial reporting results.

If the goal of financial reporting is consistency and ease of comparability (events which are identical in their economic substance generating identical financial reports), then the current financial reporting regimes fail to achieve this goal. Furthermore, it is challenging to see how reporting standards *can* achieve this goal. We do not think it is a matter of relative ingenuity of writers of reporting rules and financial engineers. The constraints under which any regulator (including writers of accounting rules) functions prevents them from outwitting the financial engineers. Our detailed example's examination of the financial engineering consequences for reporting illustrates the more general problem of conflict between financial reporting and financial engineering analyzed in Dye, Glover and Sunder (2015).

2. Example

We analyze a simple transaction by entity X to take a leveraged position in a nominal sum of 100 dollars' worth of securities by borrowing. In his paper, Merton (1995) lists eleven different, but economically equivalent, combinations of transactions in various financial instruments for X to acquire the same net-leveraged position in Standard and Poor's (S&P) 500 stocks. These methods follow:

1. *Buy each stock individually on margin in the cash stock market.*
2. *Invest in an S&P 500 Index fund and borrow from a bank to finance it.*
3. *Go long on a futures contract on the S&P 500.*
4. *Go long on an OTC forward contract on the S&P 500.*
5. *Enter into a swap contract to receive the total return on the S&P 500 and pay LIBOR or some other standard interest rate.*
6. *Go long on exchange traded calls and short puts on the S&P 500.*
7. *Go long on OTC calls and short puts.*
8. *Purchase an equity-linked note which pays based on the S&P 500 and finance it by a repurchase agreement.*
9. *Purchase from a bank a certificate of deposit which has payment linked to the return on the S&P 500.*
10. *Buy on margin or purchase the capital appreciation component of a unit investment trust (examples are Super Shares or SPDRs) which holds the S&P 500.*
11. *Borrow to buy a variable-rate annuity contract that has its return linked to the S&P 500.*

As detailed in the Appendix, each of these eleven ways for firm X to achieve the same net effect involves different sets of transactions using different instruments with a variety of parties. We do not analyze the unit investment trust (Transaction/Instrument #10), because ascertaining the proper accounting for this uncommon instrument is difficult. We analyze the 10 remaining methods and apply to these 10 the prevailing U.S. financial reporting standards which are written to achieve comparability and uniformity in financial reporting. We then examine their

effectiveness in achieving comparability and uniformity. This analysis could be applied then to the other parties' financial reports, but we do not do so for the sake of brevity.

In a second piece of analysis, we assume that X wants to achieve one of several possible financial goals such as maximizing return on equity capital or minimizing leverage, for example, one at a time through financial reporting. This feat requires some financial engineering and the use of one of the 10 "equivalent" transactions. This analysis helps us assess the comparability and uniformity of financial reports in a financial engineering environment, a second goal of this research.

In summary, we find that without explicit optimization, choosing from the 10 ways of achieving a leveraged position generates non-trivial variations in all 12 properties of financial reports (examined in Figure 1). When X actively optimizes either net income or coverage ratio (with or without a leverage constraint) using financial engineering, the consequent investment allocation decision, and variations in net income and coverage ratio are illustrated in Table 1. From these variations, we infer that the ability of financial reporting standards to achieve comparability in the face of financial engineering is not robust.

3. Ten Ways of Achieving the Same Net Economic Result – the Process

To address the comparability and uniformity concept of financial reporting related to the 10 transactions in the face of financial engineering, we prepared journal entries for each of these transactions/instruments based on hypothetical examples. Several of the instruments noted in Merton (1995) are used for hedging purposes and thus may be subject to hedge accounting rules. The hedge accounting rules were originally outlined in ASC 815 – *Derivatives and Hedging* and

were recently updated to simplify and improve the rules[2]. However, Merton specifically points out that firms are using these instruments to take a levered position to try and obtain returns from the S&P 500, not for the purpose of hedging. Therefore, we presume that these derivatives are used for speculative purposes and are not subject to hedge accounting. The remaining sources of obtaining these levered positions tend to be loans from brokers to take positions on margin and bank loans.

For ease of comparison across transaction types, we assume that all levered positions are taken to purchase an initial $100 worth of securities. The amount of money needed to initiate the levered position may vary. For example, a firm may take out a $100 bank loan to buy the $100 of securities or it may open a margin account with $75 down to borrow the remaining $25 from a broker to purchase the $100 worth of securities. Setting a nominal amount to be put down in order to take the levered position would result in different amounts of investable funds across the transactions, which would confound comparability. So, for each transaction we assume a reasonable amount of cash is provided to initiate the levered position based on that instrument's characteristics and assume a fixed amount of investable levered funds, $100.

Journal entries are recorded from the perspective of all parties involved, with particular attention paid to those made by the firm X that takes the levered position. For transactions 1 & 2, we record separate journal entries and financial statement impacts to account for the stocks or index funds as either trading or available for sale (AFS) securities. The example we use has a two-year horizon, which suggests AFS classification. However, the inclusion of proper accounting for trading securities is done to ensure that our results are robust to shifting the

[2] See FASB Accounting Standards Codification Topic 815 – *Derivatives and Hedging*, and the related Accounting Standards Update No. 2017 – 12 for a complete description of proper hedge accounting.

horizon for our examples to one year or less. Journal entries to close out income to retained earnings are included only for the first two transactions, since the impact on net income and other comprehensive income (OCI) will differ based on classification of the securities. The closing entries to move income/loss to retained earnings will follow standard GAAP procedures to close realized gains and losses for the remaining eight transactions, so they are omitted from Appendix 1 for the sake of brevity. Journal entries for transactions 3 & 4 and 6 & 7 are grouped together, since the distinction between the two types of derivatives—over the counter (OTC) or exchange traded—do not have different accounting treatments.

We generate a set of pseudo-financial statements (untabulated) which show the financial statement impact of each of the 10 transactions in each year. Relevant ratios are also calculated to show parameters for optimization in the final analysis. We include a set of charts (Panels of Figures 1 and 2) designed to visualize the impact of the 10 transactions in each relevant period. Balance sheet items all have the same scale on the y-axis. Income statement items all have the same scale on the y-axis, which differs from the balance sheet items. Ratios have a y-axis scaling of their own, independent of the income statement and balance sheet items.

4. Results

Three panels of Figure 1 summarize the range and standard deviation across 10 different methods of achieving the same levered position on 12 different financial reporting variables.[3] These variables are organized into three panels (each with a different scale): Balance Sheet

[3] We shall present balance sheet values at the time the relevant transactions are closed. We could, equivalently, present the effect at the time the positions are opened. Since the purpose of the analysis here is simply to focus on how the financial engineering choice of transactions influences the variation in financial reports, the choice of closing rather than opening transactions and positions has no effect on analysis results. We assume a beginning value of $1,000 for assets, $500 for liabilities, and $500 for equity. This value plus the change in each balance sheet item over the period provides the denominator for both ROA and ROE, as well as both numerator and denominator for the leverage ratio.

variables in Panel A, Income Statement variables in Panel B, and financial ratios in Panel C. The 12 financial report variables are: Assets, Liabilities, Total Cash, Equity, Net Income, OCI, Interest Expense, Other Transaction Costs, Leverage, ROA, ROE and Coverage.

As shown in Panel A, the effect of economically equivalent transactions (of nominal borrowing of $100) on total assets of the firm has a range of (-103, +104) with a standard deviation of 54. Corresponding figures for total liabilities are almost identical at (-100, +100) with a standard deviation of 52. Change in cash ranges over (-98, +148) with a standard deviation of 53.339. It is clear that within the present financial reporting regime, financial engineering can alter assets and liabilities by as much as twice the amount of nominal borrowing, depending on the instruments chosen to execute the borrowing transaction.

Panel B of Figure 1 shows the effect of $100 of nominal borrowing on the range and standard deviation of five income statement variables—net income, other comprehensive income, change in equity, interest expense and other transaction costs. The effects on net income range over (-5, +5) with a standard deviation of 3.323. Other comprehensive income (OCI) has the same range, but a lower standard deviation of 2.085. The effect on owners' equity is in range (-5, +5) with a standard deviation of 3.575. Interest expense ranges over (0, 4) with a standard deviation of 1.148 and other transaction costs range over (-5, +5) with a standard deviation of 2.12. Despite the fact that all 10 transaction types considered are a form of borrowing in economic terms, some of these transactions can be engineered so the recorded interest expense is zero.

Panel C shows the variations in impact on four financial ratios: leverage (0.797 to 1.19) with a standard deviation of 0.101; return on assets (-0.5% to +0.5%) with a standard deviation of 0.003; return on equity (-0.1% to +0.1%) with a standard deviation of 0.007; and coverage

ratio (-2 to +5) with a standard deviation of 1.702. The choice of financial engineering instrument has a significant impact on the firm's interest coverage ratio—a frequently used metric of financial security.

Figure 1 summarizes the 12 different financial metrics by presenting the range and standard deviation across the 10 ways of portraying borrowing the same $100. The impact of each of the 10 transaction types across all relevant periods is shown in the 12 panels of Figure 2. It is clear from Figures 1 and 2 that under the extant financial reporting regulations, financial engineers can substantially change the key financial reporting metrics according to which instruments/transactions they choose. Accounting journal entries for the 10 different transaction choices from which the above-mentioned figures are derived are given in the Appendix.

5. Engineering to Optimize Financial Statements

The second and final part of the analysis captures optimizations using Excel's "Solver" add-in. We address the financial accounting implications of the 10 transactions from the perspective of several external financial statement users, such as a regulator, an analyst, or a banker providing capital to a firm. Keeping this perspective in mind, we use an array of optimization functions which assume that the firm has exactly 200 integer units to invest in any combination of the 10 instruments. The only constraints are that integer amounts greater than or equal to zero but less than or equal to 200 had to be invested in each security, and exactly 200 units must be invested across all available securities.

Maximizing return on equity capital, return on assets, or net income and minimizing debt-equity ratio (leverage) are reasons why financial engineers at firms use the financial

engineering tools we study. Firms may also seek to maximize or minimize these parameters of interest subject to cash or coverage constraints, among others.

The first part of this optimization procedure involves analyzing how firms would allocate each of these 200 investable units with the goal of maximizing net income while minimizing leverage. This engineering goal is worthy of examination given the multitude of reasons why managers would seek to maximize earnings (see Dechow, Ge & Schrand, 2010 for a thorough review of this literature), subject to trading off the tax benefits of using debt with the increased risk of bankruptcy from carrying too much debt (Kraus & Litzenberger, 1973; Miller, 1977).

Assuming the financial engineer is pursuing a goal of maximizing net income, we first examine the investment allocation decision subject to no leverage constraints. If the financial regulators achieved their goal of comparability across the 10 different transactions, then we should see a corner solution in which one investment vehicle is allocated all 200 investable units. While allocation of all 200 units to a single investment vehicle is a necessary condition for proof of comparability, it is not a sufficient condition. If a corner solution arises, the onus is on us to ensure that this corner solution is in fact equivalent to all other potential allocation decisions available to the engineer. Any deviations from this outcome would suggest that the regulations fail to achieve comparability across transactions with identical substance but different financial reporting requirements.

Table 1 Panel A (Panel B) provides the optimization outcomes for maximizing net income subject to no leverage constraints when Transaction 1 accounts for investments as trading (AFS) securities. This analysis does not render a corner solution. The fact that firms find it optimal to allocate investable units across investment vehicles—identical in substance but

differing in form—provides preliminary evidence that the stated goal of comparability across economically equivalent transactions is not possible.

We next analyze the allocation decisions for a financial engineer seeking to maximize net income, but subject to a binding leverage constraint. The results presented in Table 1 Panel C (Panel D) provides this constrained optimization when Transaction 1 accounts for investments as trading (AFS) securities. This optimization provides a corner solution. When trading (AFS) securities are used for Transaction 1, we find that the optimal allocation puts all 200 investable units into longing call options (investing in a certificate of deposit). From the constrained optimizations in Table 1 Panels C & D, we can see that longing call options as an investment strategy has the same impact on net income and leverage as investing in a certificate of deposit as an investment strategy. However, while the form of these two economically equivalent investment vehicles is comparable, their form is not comparable to other potential economically equivalent investment vehicles. This provides additional evidence for our claim that the 10 economic transactions studied fail to achieve the goal of financial statement comparability.

The second part of this optimization procedure involves analyzing how firms may allocate each of these 200 investable units with the goal of maximizing coverage ratios while minimizing leverage. This engineering goal is worthy of examination since higher coverage makes the firm look like a less risky borrower when applying for external debt financing. Obtaining more favorable credit terms may reduce the firm's borrowing constraints. Table 1 Panel E (Panel F) provides the optimization outcomes for maximizing the coverage ratio when Transaction 1 accounts for investments as trading (AFS) securities subject to a leverage constraint. This analysis, again, does not render a corner solution. The fact that firms find it optimal to allocate investable units across investment vehicles when the goal is to maximize the

coverage ratio provides further evidence that the stated goal of comparability across economically equivalent transactions is not met.

For the sake of brevity, we include analyses of only two potential financial engineering goals to illustrate our point. Similar illustrations of how agents interested in optimizing other financial reporting attributes can do so by choosing combinations of transactions and instruments are easy to construct. The current financial reporting regime incentivizes agents, especially firm managers, to engage financial engineers in order to window dress the financial reports by taking advantage of the various forms for the same economically equivalent transactions available to them through financial engineering.

6. Concluding Remarks

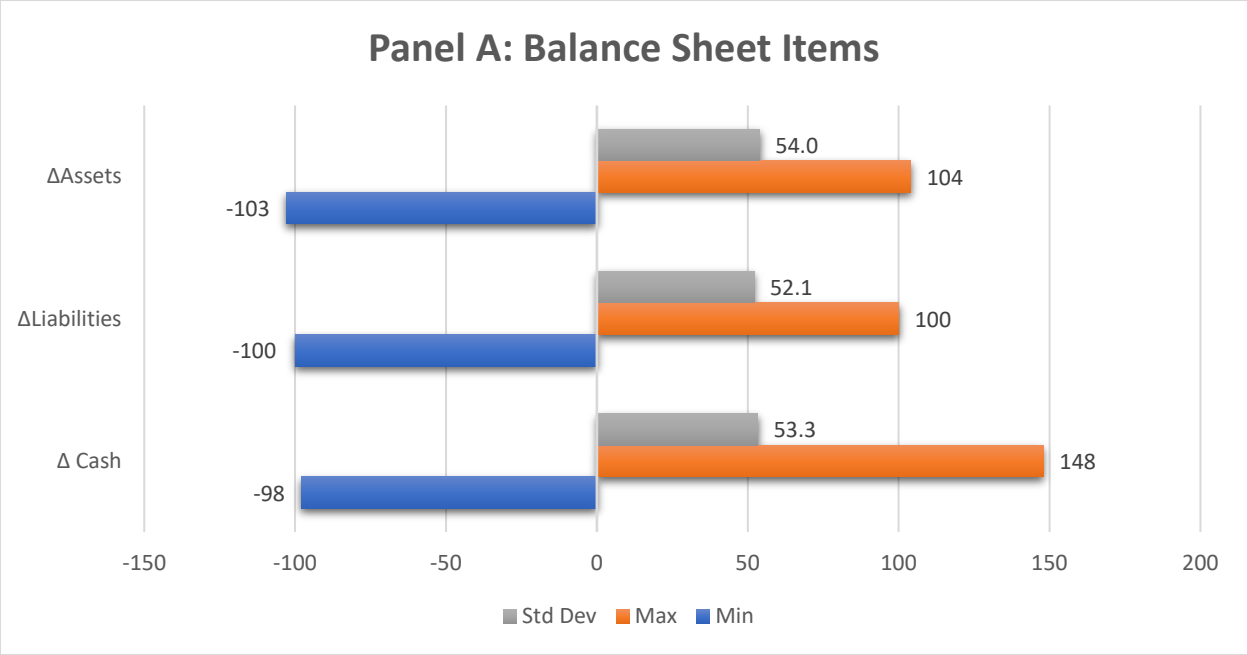
For some reason, the large and pervasive influence and impact of financial engineering on financial reports has received little attention in accounting and financial research. Financial regulators such as the Securities and Exchange Commission and privately-funded boards who write financial reporting rules largely refrain from drawing explicit attention to any consideration they may have given to robustness with respect to financial engineering of financial reports generated under their rules. The simple analysis presented in this paper suggests that in the absence of robustness to financial engineering, the oft-stated goal of generating uniform and comparable financial reports—similar reports for economically similar transactions and events—remains beyond the grasp of accounting regulators.

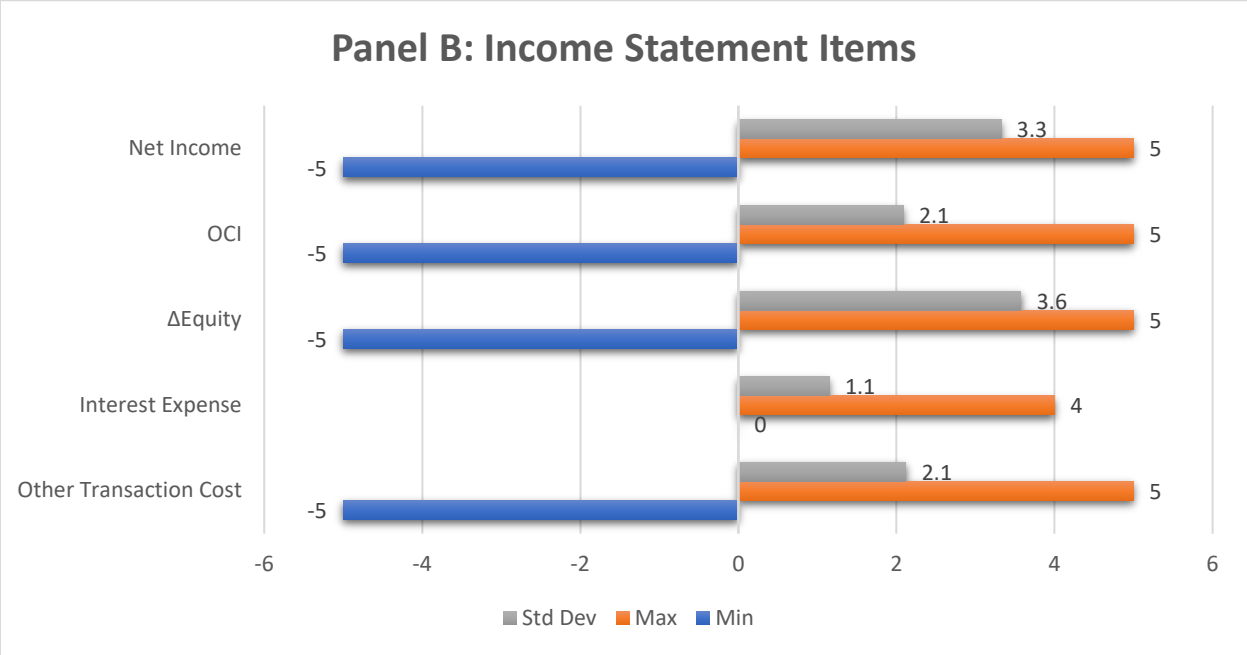
Table 1: Optimization Results

Panel A: Transaction 1 (Classified as Trading Securities) without Leverage Constraint					
Investment Instrument No. (1)	**No. of Units of Instrument (2)**	**Net Income over Life of Instrument (3)**	**Average Leverage over Life of Instrument (4)**	**Weighted Net Income = (2) x (3) (5)**	**Weighted Leverage = (2) x (4) (6)**
1	0	-2.00	1.002	-	-
2	0	1.00	0.998	-	-
3 & 4	0	-1.00	1.003	-	-
5	0	0.67	0.999	-	-
6 & 7 Long	20	5.00	0.990	100	19.802
6 & 7 Short	0	-5.00	1.010	-	-
8	112	1.00	0.998	112	111.776
9	27	5.00	0.990	135	26.733
11	41	3.67	0.993	150.333	40.691
				Column Sum = 497.333	**Column Sum /200 = 0.995**
Panel B: Transaction 1 (Classified as AFS) without Leverage Constraint					
1	0	-2.00	1.002	-	-
2	0	1.00	0.998	-	-
3 & 4	0	-1.00	1.003	-	-
5	0	0.67	0.999	-	-
6 & 7 Long	1	5.00	0.990	5	0.990
6 & 7 Short	0	-5.00	1.010	-	-
8	0	1.00	0.998	-	-
9	3	5.00	0.990	15	2.970
11	196	3.67	0.993	718.667	194.523
				Column Sum = 738.667	**Column Sum /200 = 0.992**
Panel C: Transaction 1 (Classified as Trading Securities) with Leverage Constraint					
1	0	-2.00	1.002	-	-
2	0	1.00	0.998	-	-
3 & 4	0	-1.00	1.003	-	-
5	0	0.67	0.999	-	-
6 & 7 Long	200	5.00	0.990	1,000	198.020
6 & 7 Short	0	-5.00	1.010	-	-
8	0	1.00	0.998	-	-
9	0	5.00	0.990	-	-
11	0	3.67	0.993	-	-
				Column Sum = 1,000	**Column Sum /200 = 0.990**

Panel D: Transaction 1 (Classified as AFS) with Leverage Constraint					
Investment Instrument No. (1)	**No. of Units of Instrument (2)**	**Net Income over Life of Instrument (3)**	**Average Leverage over Life of Instrument (4)**	**Weighted Net Income = (2) x (3) (5)**	**Weighted Leverage = (2) x (4) (6)**
1	0	-2.00	1.002	-	-
2	0	1.00	0.998	-	-
3 & 4	0	-1.00	1.003	-	-
5	0	0.67	0.999	-	-
6 & 7 Long	0	5.00	0.990	-	-
6 & 7 Short	0	-5.00	1.010	-	-
8	0	1.00	0.998	-	-
9	200	5.00	0.990	1,000	198.020
11	0	3.67	0.993	-	-
				Column Sum = 1,000	**Column Sum / 200 = 0.990**
Panel E: Transaction 1 (Trading Securities) with Leverage Constraint					
Investment Instrument No. (1)	**No. of Units of Instrument (2)**	**Coverage Ratio over Life of Instrument (3)**	**Average Leverage over Life of Instrument (4)**	**Weighted Coverage Ratio = (2) x (3) (5)**	**Weighted Leverage = (2) x (4) (6)**
1	84	0.60	1.002	50.4	84.143
2	0	1.50	0.998	-	-
3 & 4	0	0.00	1.003	-	-
5	0	0.00	0.999	-	-
6 & 7 Long	0	0.00	0.990	-	-
6 & 7 Short	0	0.00	1.010	-	-
8	0	1.25	0.998	-	-
9	116	0.00	0.990	0	114.851
11	0	2.67	0.993	-	-
				Column Sum = 50.40	**Column Sum / 200 = 0.995**
Panel F: Transaction 1 (AFS Securities) with Leverage Constraint					
1	1	0.60	1.002	0.6	1.002
2	21	1.50	0.998	31.50	20.951
3 & 4	10	0.00	1.003	0	10.030
5	32	0.00	0.999	0	31.957
6 & 7 Long	42	0.00	0.990	0	41.584
6 & 7 Short	12	0.00	1.010	0	12.121
8	2	1.25	0.998	2.50	1.996
9	57	0.00	0.990	0	56.436
11	23	2.67	0.993	61.33	22.827
				Column Sum = 95.93	**Column Sum / 200 = 0.995**

Figure 1: Summary Statistics for Transactions of Interest





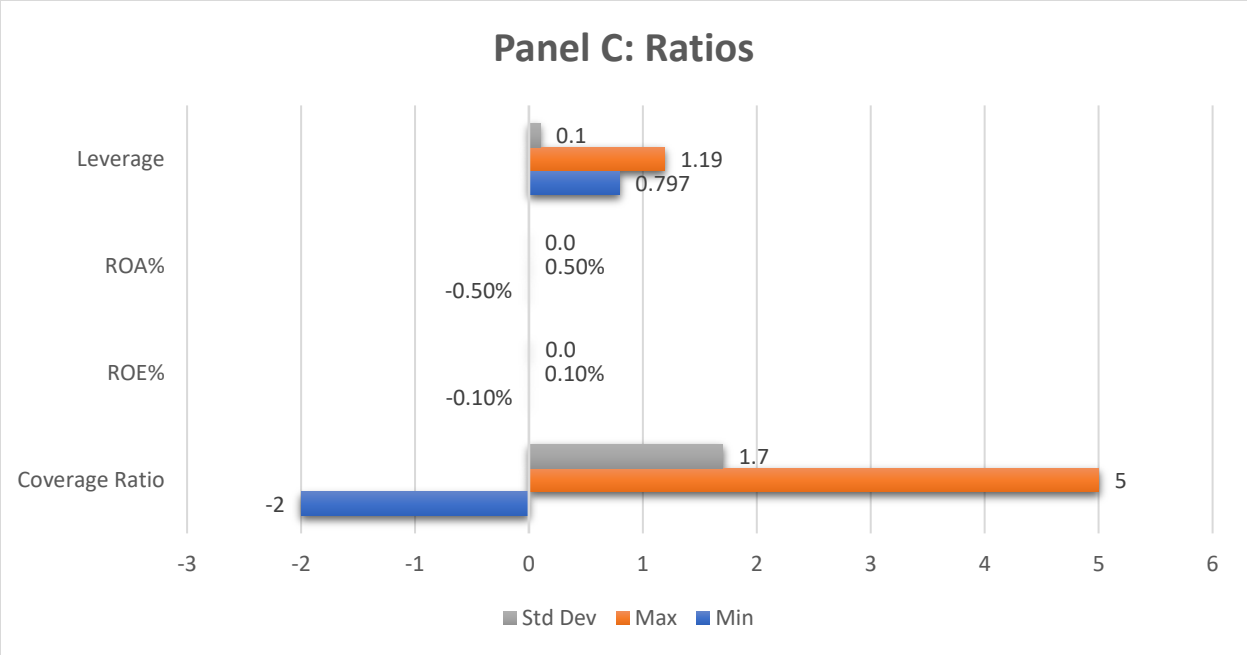
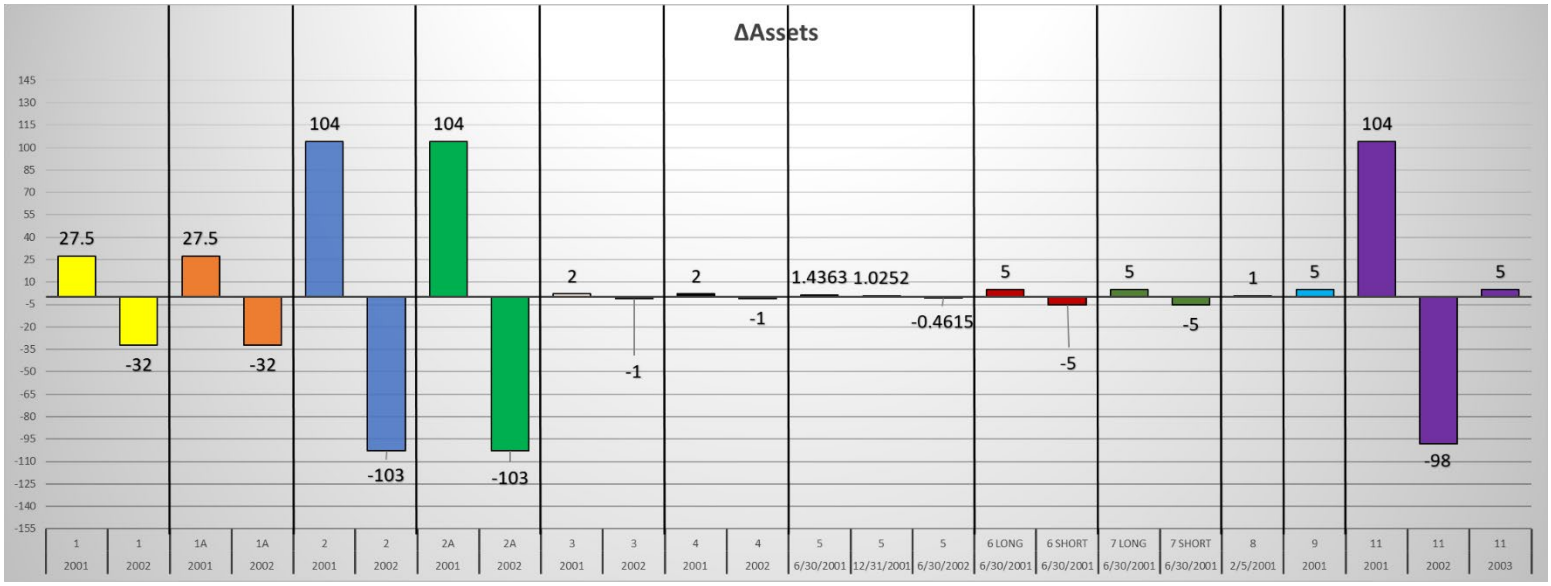
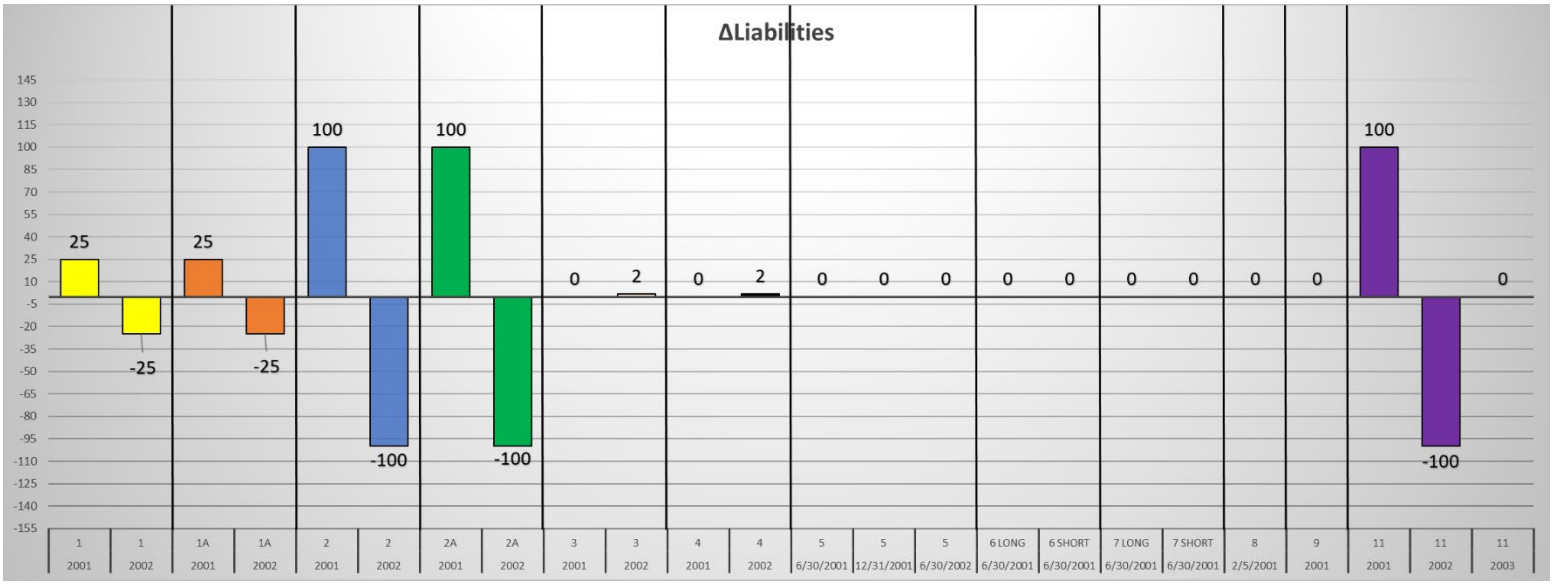
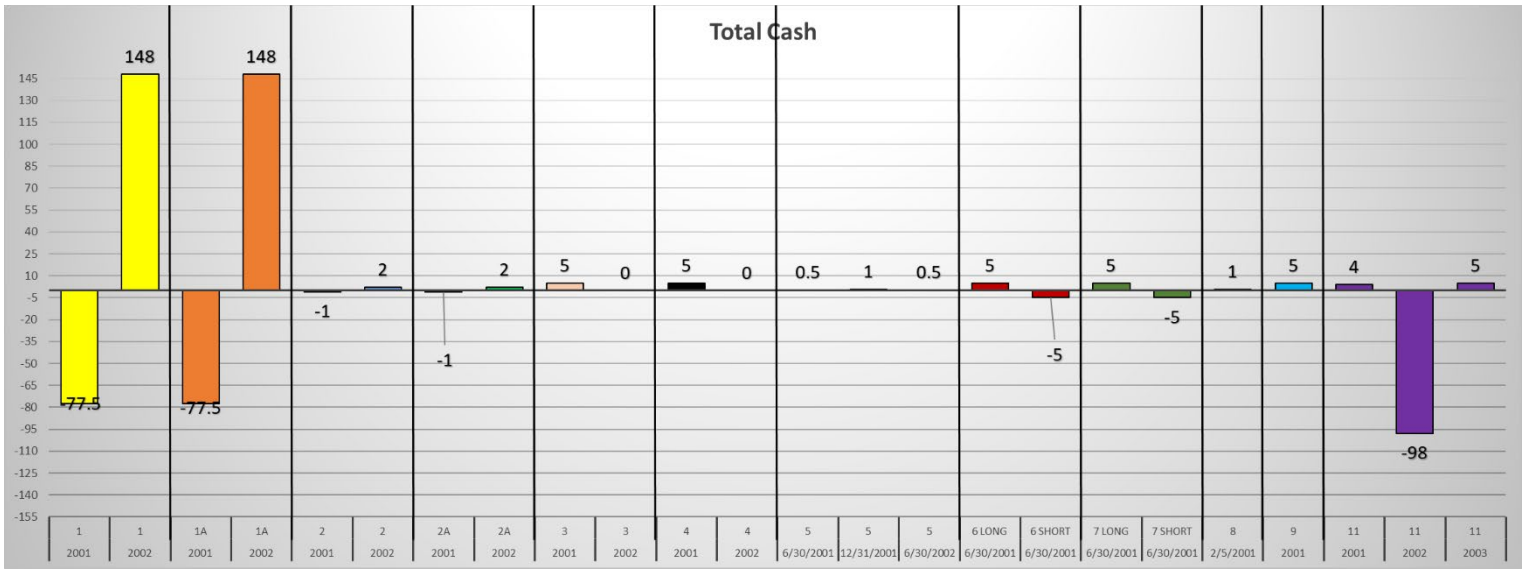
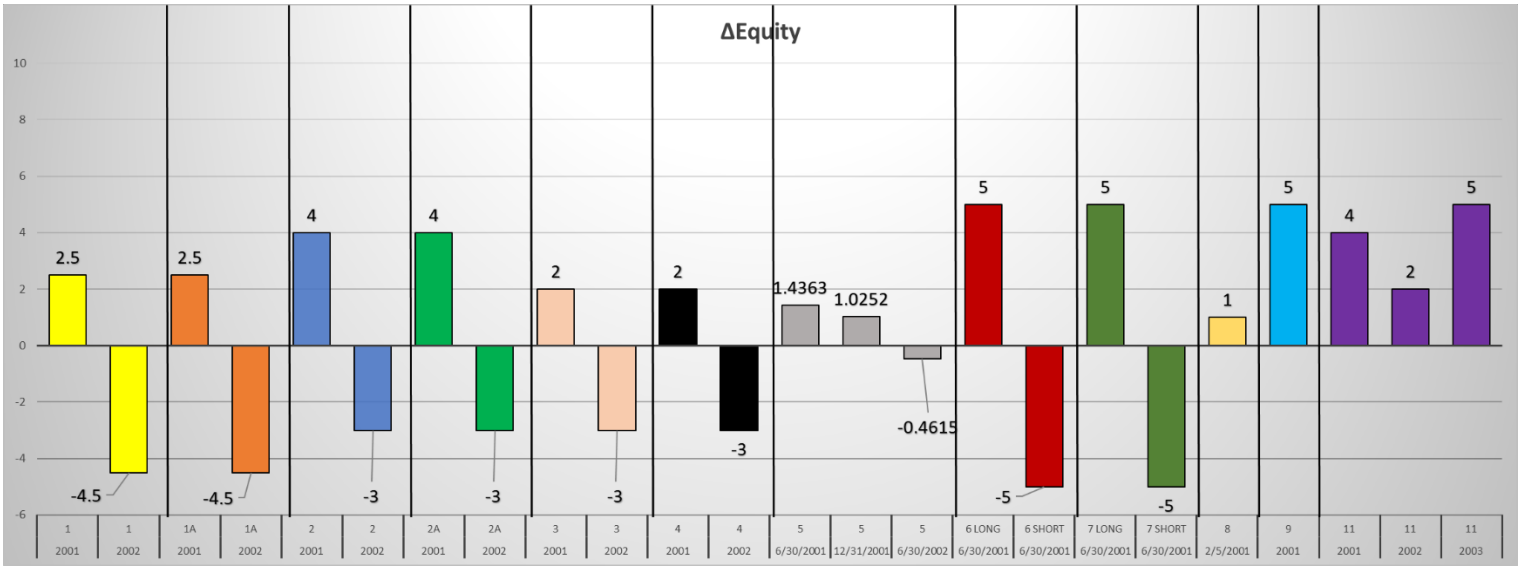


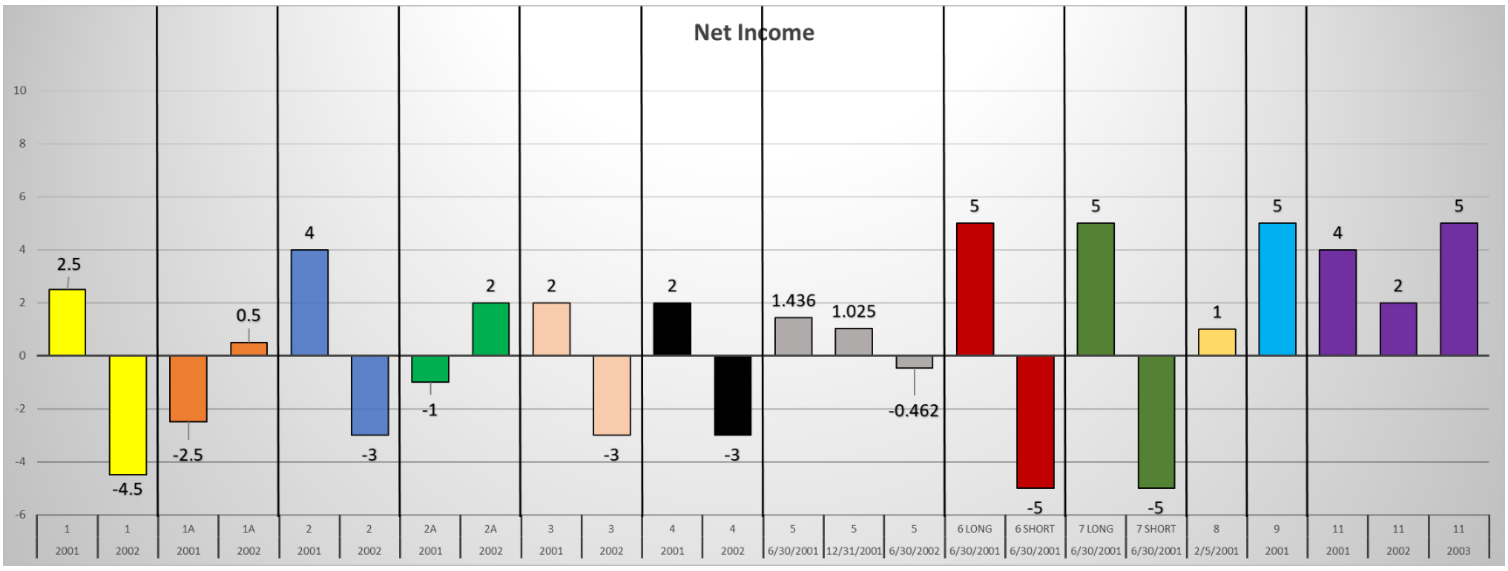
Figure 2: Graphs of Changes in Variables of Interest

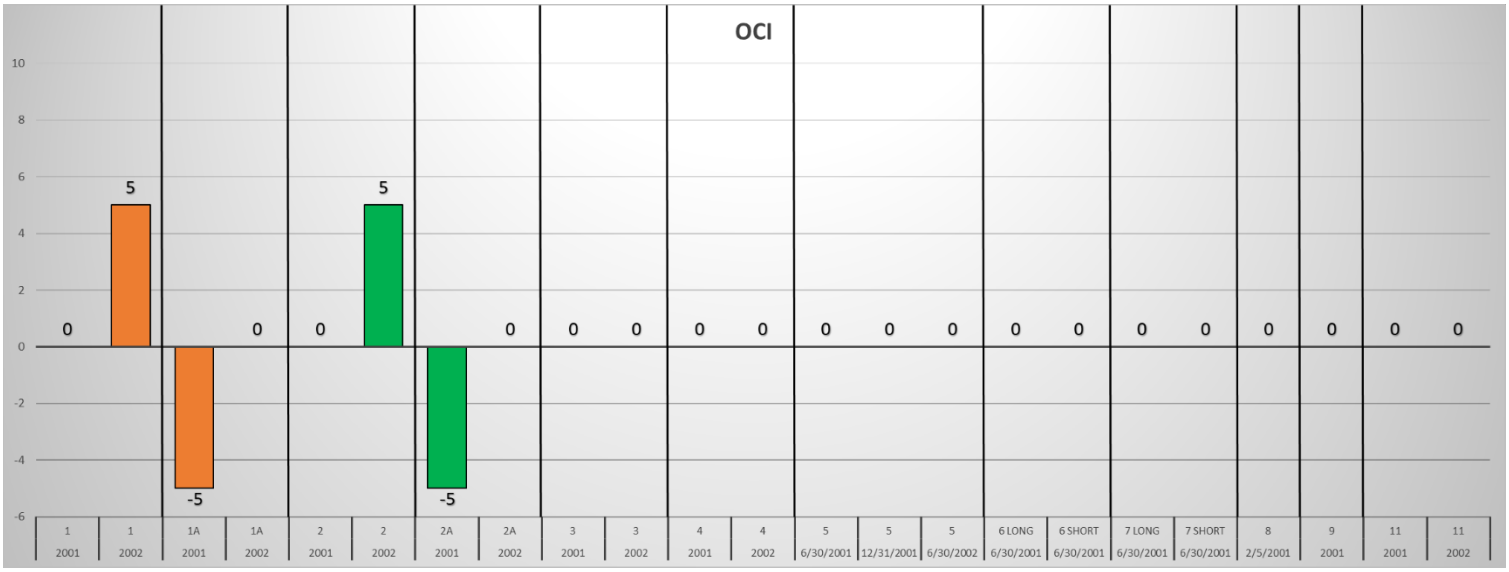


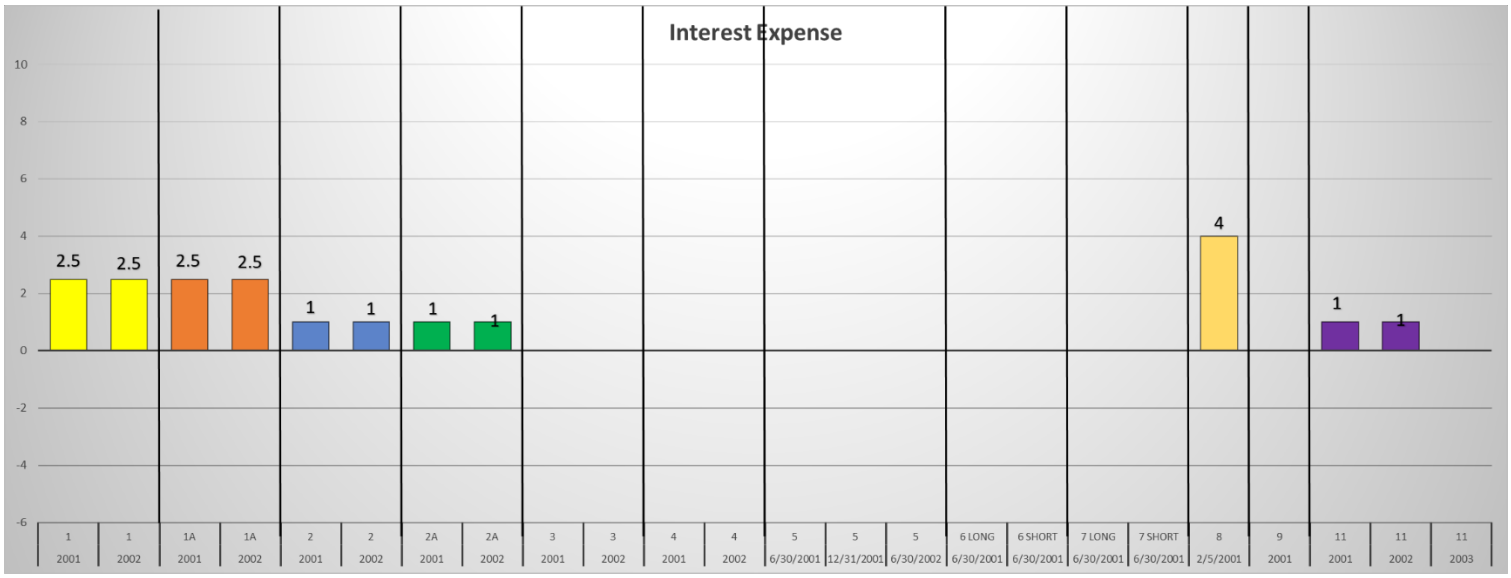


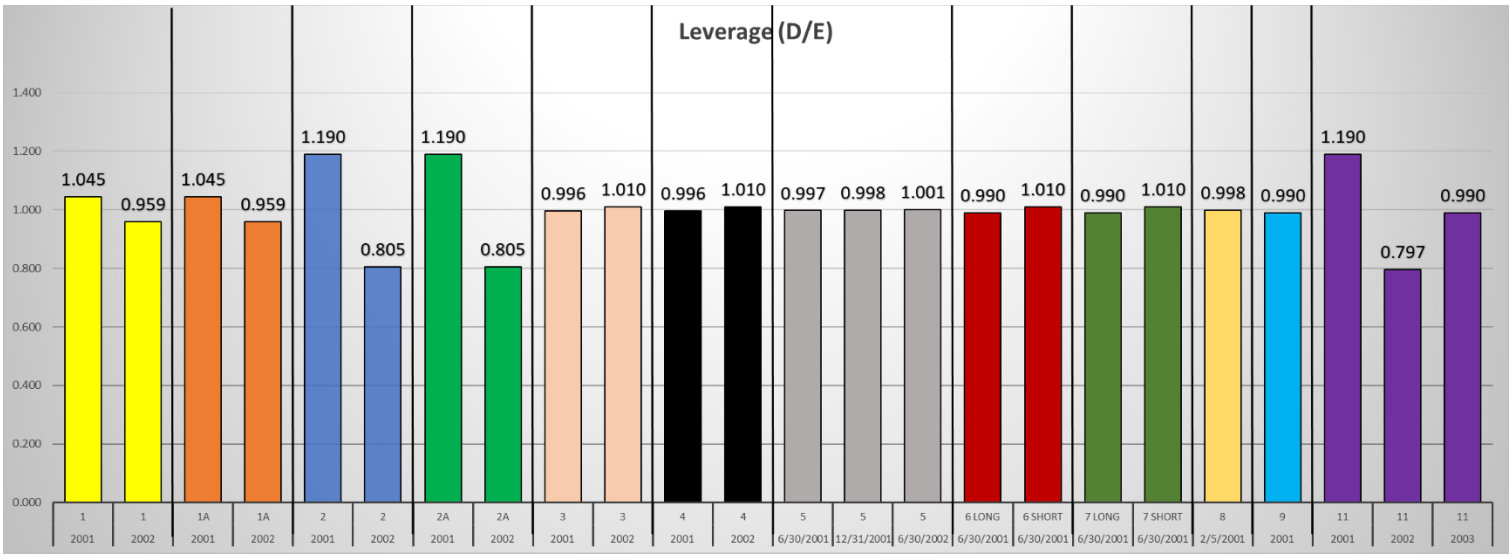


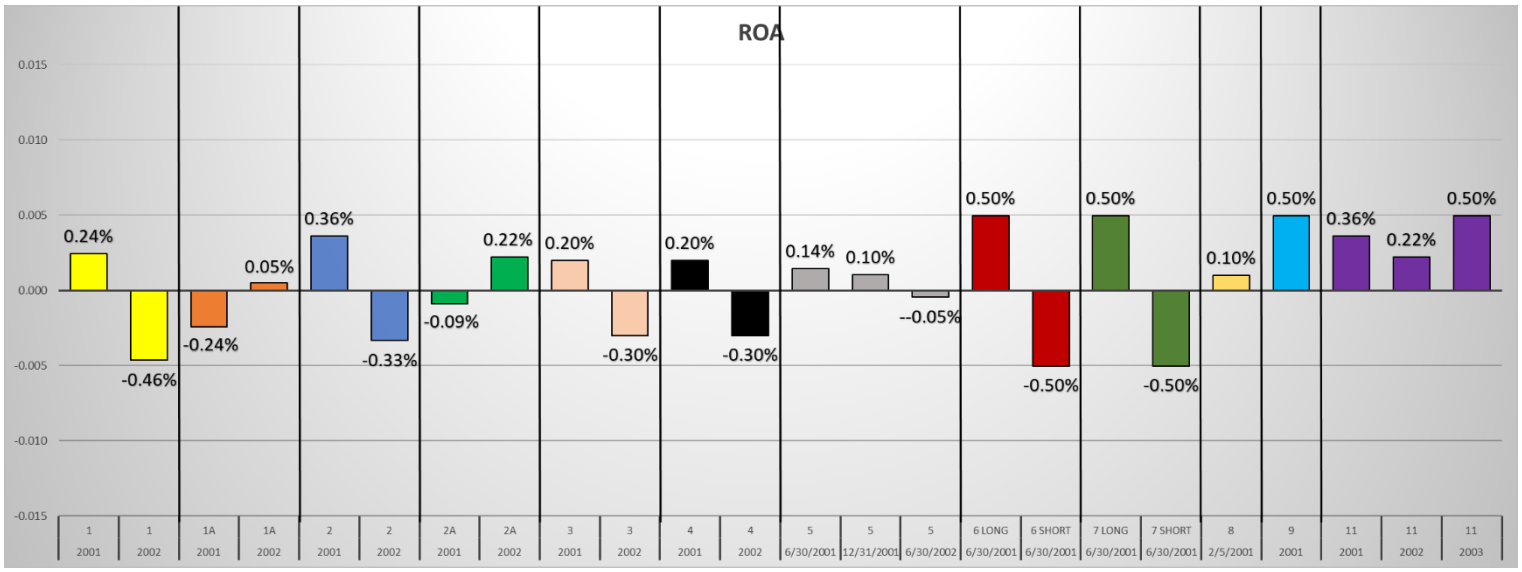


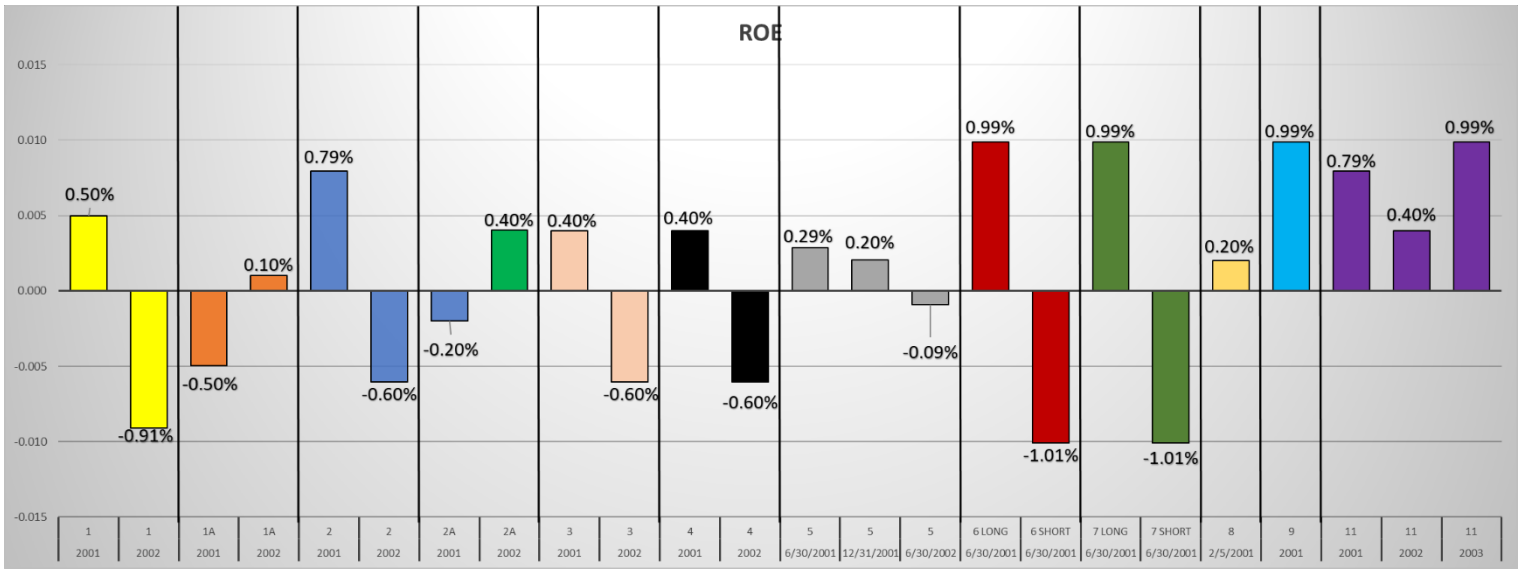


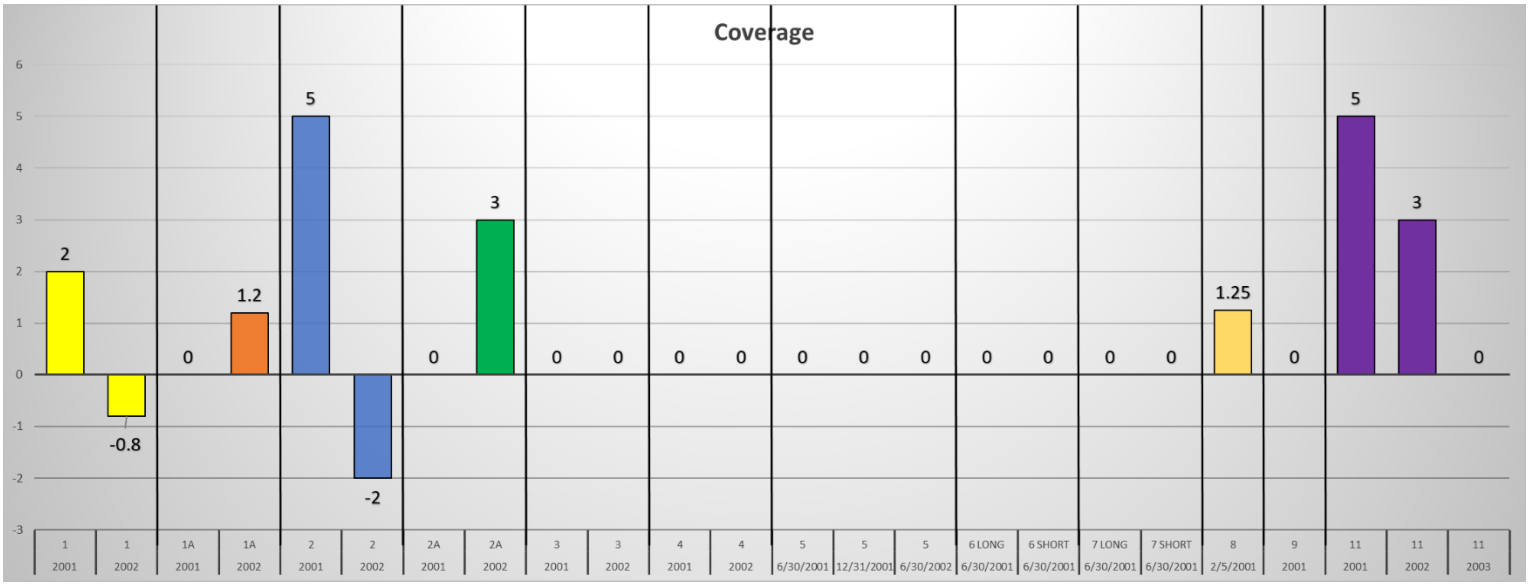












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Appendix 1: Financial Engineering Excel Workbook Journal Entries

Transaction #1

	My Books			Broker's Books		
Step 1: Set up margin account. Assume a $75 deposit in the account allows you to purchase up to $100 worth of securities.						
1/1/2001	Margin Account Investment	75		Cash	75	
	Cash		75	Brokerage Loanable Funds		75
Step 2: Purchase $100 worth of stocks, using $75 of the firm's cash and borrowing the other $25 from the margin broker.						
1/1/2001	Cash (Loan from Broker)	25		Margin Account Receivable	25	
	Margin Account Payable		25	Cash		25
1/1/2001	Marketable Securities	100		*No Entry*		
	Cash		75			
	Cash (Loan from Broker)		25			
Step 3: Stocks go to $105 in value on 12/31/01						
Trading Security				*No Entry*		
12/31/2001	Fair Value Adjustment: Marketable Securities	5				
	Unrealized Holding Gain: IS		5			
Available for Sale Security				*No Entry*		
12/31/2001	Fair Value Adjustment: Marketable Securities	5				
	Unrealized Holding Gain: OCI		5			
Held to Maturity Security				*No Entry*		
12/31/2001	No Entry					
Step 4: Pay Interest of 10% on margin loan from broker						
12/31/2001	Interest Expense	2.5		Cash	2.5	
	Cash		2.5	Interest Income		2.5
Step 5a: Close Income to Retained Earnings						
12/31/2001	Unrealized Holding Gain: IS	5				
	Interest Expense		2.5			
	Retained Earnings		2.5			
Step 5b: Close Income to Retained Earnings, and OCI to AOCI						
12/31/2001	Unrealized Holding Gain: OCI	5				
	AOCI		5			
	Retained Earnings	2.5				
	Interest Expense		2.5			

Step 6: Stocks go to $103 in Value on 12/31/02 when sold								
Trading Security					*No Entry*			
12/31/2002	Realized Loss: IS	2						
	Fair Value Adjustment: Marketable Securities		2					
Available for Sale Security					*No Entry*			
12/31/2002	*See Step 8b*							
Held to Maturity Security					*No Entry*			
12/31/2002	No Entry							
Step 7: Pay Interest of 10% on margin loan from broker								
12/31/2002	Interest Expense	2.5			Cash	2.5		
	Cash		2.5		Interest Income		2.5	
Step 8a: Cash out securities at $103								
12/31/2002	Cash	103			No Entry			
	Marketable Securities		103					
Step 8b: Cash out securities at $103 on 12/31/02								
12/31/2002	Cash	103			No Entry			
	Unrealized Holding Gain: OCI	5						
	Marketable Securities		105					
	Realized Gain on Investment: I/S		3					
Step 9: Pay back the margin loan from the broker								
12/31/2002	Margin Account Payable	25			Cash	25		
	Cash		25		Margin Account Receivable		25	
Step 10: Close out the margin account								
12/31/2002	Cash	75			Brokerage Loanable Funds	75		
	Margin Account Investment		75		Cash		75	
Step 11a: Close Income to Retained Earnings								
12/31/2002	Retained Earnings	4.5						
	Interest Expense		2.5					
	Realized Loss: IS		2					
Step 11b: Close Income to Retained Earnings, OCI to AOCI, Close AOCI to 0								
12/31/2002	AOCI	5						
	Unrealized Holding Gain: OCI		5					
	Realized Gain on Investment: I/S	3						
	Retained Earnings		0.5					
	Interest Expense		2.5					

Transaction # 2

	My Books			Bank Books			Fund Books		
Step 1: Take out bank loan (2 year note, 1% annual interest due at end of year)									
1/1/2001	Cash	100		Notes Receivable	100		No Entry		
	Notes Payable		100	Cash		100			
Step 2: Purchase Index Fund									
1/1/2001	Investment	100		No Entry			Cash	100	
	Cash		100				Accounts Payable		100
Step 3: Index Fund Goes to $105 in value on 12/31/01									
Trading Security									
12/31/2001	Fair Value Adjustment: Investment	5		No Entry			Fair Value Adjustment: Fund	5	
	Unrealized Holding Gain: IS		5				Fund Retained Earnings		5
Available for Sale Security									
12/31/2001	Fair Value Adjustment: Investment	5		No Entry			Fair Value Adjustment: Fund	5	
	Unrealized Holding Gain: OCI		5				Fund Retained Earnings		5
Held to Maturity Security									
12/31/2001	No Entry			No Entry			Fair Value Adjustment: Fund	5	
							Fund Retained Earnings		5
Step 4: Pay Interest to bank for loan									
12/31/2001	Interest Expense	1		Cash	1		No Entry		
	Cash		1	Interest Income		1			
Step 5a: Close Income to Retained Earnings									
12/31/2001	Unrealized Holding Gain: IS	5							
	Interest Expense		1						
	Retained Earnings		4						
Step 5b: Close Income to Retained Earnings, and OCI to AOCI									
12/31/2001	Unrealized Holding Gain: OCI	5							
	AOCI		5						
	Retained Earnings	1							
	Interest Expense		1						
Step 6: Index Fund goes to $103 in Value on 12/31/02, when sold									
Trading Security									
12/31/2002	Realized Loss: IS	2		No Entry			Fund Retained Earnings	2	
	Fair Value Adjustment: Investment		2				Fair Value Adjustment: Fund		2
Available for Sale Security									
12/31/2002	*See Step 8b*			No Entry			Fund Retained Earnings	2	
							Fair Value Adjustment: Fund		2
Held to Maturity Security									
12/31/2002	No Entry			No Entry			Fund Retained Earnings	2	
							Fair Value Adjustment: Fund		2

Step 7: Pay Interest to bank for loan											
12/31/2002	Interest Expense	1			Cash	1			No Entry		
	Cash		1		Interest Income		1				

Step 8a: Cash out Index Fund											
12/31/2002	Cash	103			No Entry				Accounts Payable	100	
	Investment		103						Fund Retained Earnings	3	
									Cash		103

Step 8a: Cash out Index Fund at $103 on 12/31/02											
12/31/2002	Cash	103									
	Unrealized Holding Gain: OCI	5			No Entry				Accounts Payable	100	
	Marketable Securities		105						Fund Retained Earnings	3	
	Realized Gain on Investment: I/S		3						Cash		103

Step 9: Pay off bank loan											
12/31/2002	Note Payable	100			Cash	100			No Entry		
	Cash		100		Note Receivable		100				

Step 10a: Close Income to Retained Earnings			
12/31/2002	Retained Earnings	3	
	Interest Expense		1
	Realized Loss: IS		2

Step 10b: Close Income to Retained Earnings, OCI to AOCI, Close AOCI to 0			
12/31/2002	AOCI	5	
	Unrealized Holding Gain: OCI		5
	Realized Gain on Investment: I/S	3	
	Retained Earnings		2
	Interest Expense		1

Transactions # 3&4 (identical accounting treatment)

	My Books			Counterparty's Books			Broker's Books		
Step 1: Assume I enter into a forward/futures contract on 1/1/2001 when the S&P 500 is trading at $100. I expect the price to go up by 12/31/02, so I take a long position on the contract. I must put down a $20 margin deposit to enter the forward/futures contract.									
1/1/2001	Margin Deposit	20		Margin Deposit	20		Cash	40	
	Cash		20	Cash		20	Margin Deposit		40
Step 2: Assume that the S&P 500 is trading at $103 at 12/31/01. I must recognize the gain on the futures contract (bought at $100) on my income statement each year, since this derivative does not meet the hedging classification.									
12/31/2001	Receivable from Futures Broker	3		Loss on Futures Contract	3		Futures Contract	3	
	Gain on Futures Contract		3	Payable to Futures Broker		3	Net Payable to "Winner"		3
Step 3: Assume both parties must pay a $1 broker's fee at the end of each year									
12/31/2001	Broker's Fee Expense	1		Broker's Fee Expense	1		Cash	2	
	Cash		1	Cash		1	Broker's Fee Revenue		2
Step 4: Now, assume that the S&P is trading at $101 at 12/31/02. I must recognize the loss on the futures contract (valued at $103 at the end of last year) on my income statement, since this derivative does not meet the hedging classification.									
12/31/2002	Loss on Futures Contract	2		Receivable from Futures Broker	2		Net Payable to "Winner"	2	
	Payable to Futures Broker		2	Gain on Futures Contract		2	Futures Contract		2
Step 5: Assume both parties must pay a $1 broker's fee at the end of each year									
12/31/2002	Broker's Fee Expense	1		Broker's Fee Expense	1		Cash	2	
	Cash		1	Cash		1	Broker's Fee Revenue		2
Step 6: Now, we need to have a net settlement on the futures contract. Since the price is at $101, and I took the long position, the counterparty owes me $1. This will be received from the broker, after he is paid by the counterparty.									
12/31/2002	Cash	1		Net Payable to Futures Broker	1		Net Payable to "Winner"	1	
	Net Receivable From Futures Broker		1	Cash		1	Futures Contract		1
Step 7: Last, I get back my Margin Deposit and close out the account.									
12/31/2002	Cash	20		Cash	20		Margin Deposit	40	
	Margin Deposit		20	Margin Deposit		20	Cash		40

Transaction # 5

	My Books			Counterparty's Books		
Step 1: I enter into an 18-month interest rate swap with the counterparty. Since this interest rate swap is NOT being used to hedge, no journal entry is required on the initial date. Assume the two rates are equal at the beginning, so the swap has a fair value of zero at the initial date.						
1/1/2001	No Entry			No Entry		
Step 2: The swap dictates that I will pay a standard rate of interest, and receive a variable rate of interest which is tied to the S&P 500 total return. Assume S&P 500 returns are 5% for 6 months, and standard interest rate is 4.5% on an underlying principal amount of $100 at 6/30/01. We need to record the net cash settlement:						
6/30/2001	Cash	0.5		Interest Expense	0.5	
	Interest Income		0.5	Cash		0.5
Step 3: We also need to record the fair value of the interest rate swap on the balance sheet at 6/30/01. It shows up as either an asset or a liability depending on if the swap generates a gain or a loss, respectively.						
6/30/2001	Interest Rate Swap	0.9363		Holding loss - interest rate swap	0.9363	
	Holding gain - interest rate swap		0.9363	Interest Rate Swap		0.9363
Step 4: Assume that on 12/31/01, the S&P 500 returns are 5% for 6 months, but the standard interest rate has fallen to 4% on the underlying amount of $100. We need to record the net cash settlement:						
12/31/2001	Cash	1		Interest Expense	1	
	Interest Income		1	Cash		1
Step 5: We also need to record the fair value of the interest rate swap on the balance sheet at 12/31/01. It shows up as either an asset or a liability depending on if the swap generates a gain or a loss, respectively.						
12/31/2001	Interest Rate Swap	0.0252		Holding loss - interest rate swap	0.0252	
	Holding gain - interest rate swap		0.0252	Interest Rate Swap		0.0252
Step 6: Assume that on 6/30/02, the S&P 500 returns are 5% for the 6 months, but the standard interest rate has risen to 4.5% on the underlying amount of $100. We need to record the net cash settlement:						
6/30/2002	Cash	0.5		Interest Expense	0.5	
	Interest Income		0.5	Cash		0.5
Step 7: We also need to record the fair value of the interest rate swap on the balance sheet at 6/30/02. Since the 18-month period covering the swap is now over, we write-off the swap entirely.						
6/30/2002	Holding loss - interest rate swap	0.9615		Interest Rate Swap	0.9615	
	Interest Rate Swap		0.9615	Holding gain - interest rate swap		0.9615

Transactions 6 & 7 (Long)

	My Books			Option Seller's Books		
Step 1: Purchase (long) 1 call option of the S&P 500 with a strike price of $100 and a premium of $5. The option expires on 6/30/2001.						
1/1/2001	Purchased Call Option	5		Cash	5	
	Cash		5	Purchased Call Option		5
Step 2: Record the change in the time value of the purchased call option. The time value is $5 at initiation, and $0 at the expiration date.						
6/30/2001	Option Expense	5		No entry		
	Purchased Call Option		5			
Step 3: Assume the S&P 500 trades at 110 at the expiration of the option. The option is exercised, and the intrinsic value of the option is 1 x (110-100)						
6/30/2001	Purchased Call Option	10		No entry		
	Gain on Option Contract		10			
Step 4: Record the cash settlement of the call option. $10 x 1 option.						
6/30/2001	Cash	10		Purchased Call Option	10	
	Purchased Call Option		10	Cash		10

Transactions 6 & 7 (Short):

	My Books			Option Buyer's Books		
Step 1: Sell (short) 1 put option of the S&P 500 with a strike price of $100 and a premium of $5. The option expires on 6/30/2001.						
1/1/2001	Cash	5		Sold Put Option	5	
	Sold Put Option		5	Cash		5
Step 2: Record the change in the time value of the sold put option. The time value is $5 at initiation, and $0 at the expiration date.						
6/30/2001	Sold Put Option	5		Change in time value of Put Option	5	
	Change in time value of Put Option		5	Sold Put Option		5
Step 3: Assume the S&P 500 trades at 90 at the expiration of the option. The option is exercised by the buyer, and the intrinsic value of the option is 1 x (100-90) to the buyer.						
6/30/2001	Loss on Option Contract	10		Sold Put Option	10	
	Sold Put Option		10	Gain on Option Contract		10
Step 4: Record the cash settlement of the put option. $10 x 1 option.						
6/30/2001	Sold Put Option	10		Cash	10	
	Cash		10	Sold Put Option		10

Transaction 8 (example courtesy of PwC)

	My Books				Bank Books		
Step 1: Record the repurchase agreement. I transfer security with $100 fair value for $98 cash. I agree to repurchase the security in 35 days. The fair value of the security remains constant. My return from investing the cash is linked to the S&P 500 return. The bank receives a fee of $4 from me, based on an approximate 4% annual rate for 35 days.							
1/1/2001	Cash	98			Reverse repo agreements	98	
	Obligations under repo agreements		98		Cash		98
Reclassify the pledged security that the secured party has the right to sell or repledge							
	Securities pledged	100			No entry to recognize the security on balance sheet		
	Securities		100				
Step 2: Bank records the investment of the cash collateral.							
1/1/2001	Equity linked note investment	98			No entry		
	Cash		98				
Step 3: Assume the S&P 500 returns at the end of the 35 days is 5%. Now, we close out the repurchase agreement.							
2/5/2001	Cash	103			Cash	102	
	Interest Income		5		Reverse repo agreements		98
	Equity linked note investment		98		Interest Income		4
	Securities	100			No entry		
	Securities pledged		100				
Step 4: Record repayment of repurchase principal and interest							
2/5/2001	Obligations under repo agreements	98			No entry		
	Interest expense	4					
	Cash		102				

Transaction # 9

	My Books				Bank Books		
Step 1: Purchase $100 CD from Bank, paying the annual return on the S&P 500 at maturity, with a 1 year maturity							
1/1/2001	CD Investment	100			Cash	100	
	Cash		100		Deposits		100
Step 2: Assume the S&P 500 returns are 5% for the year							
12/31/2001	CD Interest Receivable	5			CD Interest Expense	5	
	CD Interest Revenue		5		CD Interest Payable		5
Step 3: Bank Pays the Interest and returns the deposit							
12/31/2001	Cash	105			Deposits	100	
	CD Investment		100		CD Interest Payable	5	
	CD Interest Receivable		5		Cash		105

Transaction #11

	My Books			Bank Books			Annuity Provider's Books		
Step 1: Take out bank loan (2 year note, 1% annual interest due at end of year)									
1/1/2001	Cash	100		Notes Receivable	100		No Entry		
	Notes Payable		100	Cash		100			
Step 2: Purchase Annuity Contract, paying the return on the S&P 500 annually									
1/1/2001	Annuity Investment	100		No Entry			Cash	100	
	Cash		100				Annuity Deposit		100
Step 3: Assume the S&P 500 returns are 5% for the first year									
12/31/2001	Cash	5		No Entry			Annuity Expense	5	
	Annuity Revenue		5				Cash		5
Step 4: Pay Interest to bank for loan									
12/31/2001	Interest Expense	1		Cash	1		No Entry		
	Cash		1	Interest Income		1			
Step 5: Assume the S&P 500 returns are 3% for the second year									
12/31/2002	Cash	3		No Entry			Annuity Expense	3	
	Annuity Revenue		3				Cash		3
Step 6: Pay Interest to bank for loan									
12/31/2002	Interest Expense	1		Cash	1		No Entry		
	Cash		1	Interest Income		1			
Step 7: Pay off bank loan									
12/31/2002	Note Payable	100		Cash	100		No Entry		
	Cash		100	Note Receivable		100			
Step 8: Assume the S&P 500 returns are 5% for the third year (This entry will continue in perpetuity over the life of the annuity)									
12/31/2003	Cash	5		No Entry			Annuity Expense	5	
	Annuity Revenue		5				Cash		5