

What Drives the Value of Analysts' Recommendations: Cash Flow Estimates or Discount Rate Estimates?

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Background

- Security analysts provide investment advice
 - Reports
 - Earnings estimates
 - Stock recommendations
- Upgrades and downgrades when their valuation is different than that of the market
- Empirically: Price impact of recommendation changes
 - On average, changes in recommendations have a significant price impact
 - Not all information is impounded in prices immediately
 - ◆ E.g., Womack (1996), Barber et. al. (2001)



The Framework

- The basic valuation framework

$$P = \sum \frac{C_t}{(1 + r_t)^t}$$

$$P = \frac{C}{r - g}$$

- Valuation (of analysts and market) can diverge b/c of:
 - ◆ Different assessments of cash flows and/or
 - ◆ Different assessments of discount rate



The Framework

- When an analyst changes her recommendation and at the same time changes her (short-term) earnings estimate
 - We refer to these as **Earnings-Based Recommendations**
- Recommendations that are not accompanied by a change in estimated earnings are (implicitly or explicitly) based on changes in estimated discount rate and/or changes in long-term earnings growth rate
 - We refer to these as **Discount Rate-Based Recommendations**
 - Equivalently: Non-earnings based recommendations



Why might earnings-based recommendations have different information content than discount rate-based recommendations?

- **Hard information**
 - Earnings are the most followed statistics in company reporting
 - Always the focus of analysts' reports
- **Verifiable**
 - The accuracy of earnings estimates are easily verifiable
- **Short forecast horizon**
 - Earnings are reported frequently (quarterly)
 - Easier to estimate short-term than long-term factors
- **Soft information**
 - Discount rates and changes in growth rates are hardly ever mentioned explicitly
 - No company guidance for more than 2-3 years out
- **Not verifiable**
 - Hard to estimate, hard to verify ex post
 - Noisy estimates
- **Long forecast horizon**



Earnings-based recommendations vs. discount rate-based recommendations

- Earnings-based recommendations
 - Easier to estimate, less noisy
 - Less possibilities for incentive biases
 - Less possibilities for cognitive biases
- Discount rate-based recommendations
 - Longer forecast horizon: More subject to cognitive biases (e.g. Ganzach and Krantz, 1991)
 - Not verifiable: Easier to be biased--whether heuristics or conflict of interests, (e.g., Daniel, Hirshleifer and Subrahmanyam, 1998; Gervais and Odean 2001)



The Hypothesis

- Earnings-based recommendations are more informative than discount rate-based recommendations



Related Literature

- Value of recommendations
 - Stickel (1995), Womack (1996), Barber et al. (2001)
- Biases in recommendations
 - Lin & McNichols (1998), Michaely & Womack (1999)
- What makes recommendations more valuable
 - Firm characteristics: Jegadeesh et al. (2004)
 - Recommendation characteristics: Loh and Stulz (2009)
- Cash flow vs. discount rate information
 - Cohen, Polk, Vuolteenaho (2003), Campbell, Polk, Vuolteenaho (2009)



Testable Implications: Initial Market Reaction

- An upgrade with earnings increased (earnings-based rec) should be viewed more positively than an upgrade without an earnings increase (discount rate-based rec)
- A downgrade with earnings decreased (earnings-based rec) should be viewed more negatively than a downgrade without an earnings decrease (discount rate-based rec)



Testable Implications: The Drift

- A priori, it is not clear whether the drift after earnings-based recommendation changes should be bigger or smaller than after discount rate-based recommendation changes.
 - The market appears to undervalue information about intangibles versus tangibles (e.g., Lev and Sougiannis (1996), Daniel and Titman (2006)
 - ◆ The drift after earnings-based recommendation changes should be smaller
 - Previous studies on recommendations (as other corporate events) document a drift in the same direction as the initial return.
 - ◆ Since earnings-based recommendation changes appear to be more informative as evidenced by their bigger initial price reaction, the drift could be bigger



Plan for the Remainder of Presentation

- Data
- Univariate results
- Multivariate results
- What if the analysts opinion did not change but the market's expectations changed?
- The role of Growth rate
- Large (and innovative) changes in earnings and recommendaiotns
- Robustness
- Trading strategy
- Conclusion



Data and Sample

- 123,250 recommendation changes (firm-date observations)
 - Between 1994 and 2007
 - 7,040 unique firms
 - 3,517 unique trading dates
- Daily trading data from CRSP
- Recommendations and earnings from I/B/E/S (analyst-firm-date observations)
- Annual accounting data from Compustat
- Quarterly institutional ownership from Thomson's 13-F filings
- Analyst rankings from Institutional Investor magazine
- Random sample of 150 analyst reports



Recommendation Change Categories

- Recommendation changes and earnings estimate changes on the same day (tried 1-month long window as well)
- Definition of earnings estimate change
 - At least one of FY1 and FY2 increases and neither decreases
 - At least one of FY1 and FY2 decreases and neither increases
- Categories
 - Upgrades with
 - ◆ Earnings increased
 - ◆ Earnings not changed
 - ◆ Earnings decreased
 - Downgrades with
 - ◆ Earnings increased
 - ◆ Earnings not changed
 - ◆ Earnings decreased



Excess Returns for Event-time Analysis

- Daniel, Grinblatt, Titman, and Wermers (1997) excess of characteristics returns (matched on size quintiles, book-to-market quintiles, and momentum quintiles)



[T1] Percent of observations in each recommendation change category

All upgrades (56,341 observations)	100.00
Upgrades with earnings increased	32.49
Upgrades with no earnings change	53.46
Upgrades with earnings decreased	14.04
All downgrades (66,909 observations)	100.00
Downgrades with earnings increased	10.34
Downgrades with no earnings change	53.57
Downgrades with earnings decreased	36.09



[T1] Summary statistics for variable means across all recommendation change categories

Characteristic	Range
Market cap	76 th to 82 nd percentile
Book-to-market	35 th to 44 th percentile
Turnover	70 th to 71 st percentile
Institutional ownership	73 rd to 75 th percentile
Analyst coverage	14 to 16 analysts
Return volatility	37 th to 41 st percentile
Prestigious/not brokers	30% to 34% of rec chgs
Star/not analysts	11% to 12% of rec chgs

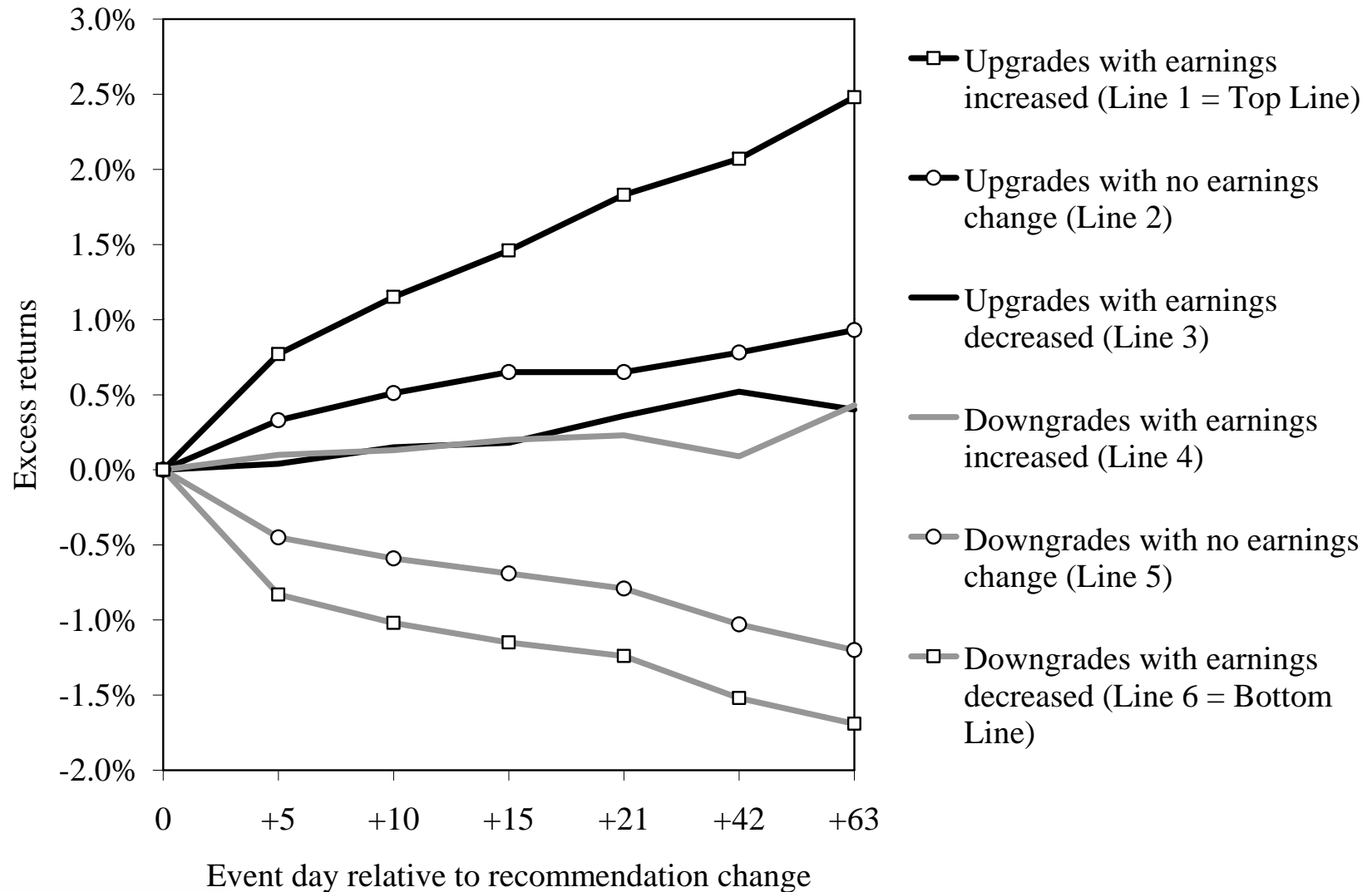


[T2] Univariate Analysis

Recommendation change category	Mean Excess Returns	
	[-1,0]	[+1,+21]
All upgrades	2.45***	0.99***
Upgrades with earnings increased	3.55***	1.83***
Upgrades with no earnings change	2.13***	0.65***
Upgrades with earnings decreased	1.11***	0.36***
All downgrades	-2.81***	-0.85***
Downgrades with earnings increased	-0.35***	0.23
Downgrades with no earnings change	-1.72***	-0.79***
Downgrades with earnings decreased	-5.11***	-1.24***



[F1] Stock returns for rec chgs and earnings chgs



Multivariate Analysis

- Multiple recommendation changes
- Recommendation changes by a prestigious broker
- Recommendation changes around earnings announcements
- Previous recommendation changes during the previous week/month
- Previous consensus earnings changes during the previous week/month
- Stock returns during the previous week/month
- “Market efficiency”
 - Size
 - Turnover
 - Institutional ownership
 - Analyst coverage
- Book-to-market
- Momentum
- Return Volatility
- Industry and quarter fixed effects (not tabulated)
- Base category (constant in regressions) is recommendation change with no earnings change
- Quarter fixed effect
- Industry fixed effect



[T3] Multivariate analysis for absolute earnings changes

	Excess returns for upgrades during		Excess returns for downgrades during	
	[-1,0]	[+1,+21]	[-1,0]	[+1,+21]
Earnings increased dummy	1.272***	1.232***	1.428***	0.969***
Earnings decreased dummy	-1.347***	-0.340**	-2.934***	-0.443***

(Omitted dummy is no earnings change)
(Control variables not shown)



Multivariate analysis results for upgrades ([-1,0]) ([+1,+21])

- (+) (+) Multiple recommendation changes
- (+) (+) Recommendation changes around earnings announcements
- (+) (0) Recommendation changes by a prestigious broker
- (0) (+) Previous recommendation changes
- (0) (0) Previous consensus earnings changes
- (-) (-) Stock returns during the previous week
- (-) (-) Market efficiency
 - Size
 - Turnover
 - Institutional ownership
 - Analyst coverage
- (+) (0) Book-to-market
- (-) (0) Momentum
- (+) (0) Return volatility



Multivariate analysis results for downgrades $([-1,0])$ $([+1,+21])$

- (-) (0) Multiple recommendation changes
- (-) (+) Recommendation changes around earnings announcements
- (-) (0) Recommendation changes by a prestigious broker
- (-) (0) Previous recommendation changes
- (-) (0) Previous consensus earnings changes
- (+) (-) Stock returns during the previous week
- (+) (+) Market efficiency
 - Size
 - Turnover
 - Institutional ownership
 - Analyst coverage
- (+) (-) Book-to-market
- (-) (-) Momentum
- (-) (-) Return volatility



What if the recommendation change is not because the analyst changes his estimates but because the market estimates changed?

- When an analyst changes his recommendation only—It will be classified as discount-rate based recommendation (since there is no change in his earnings estimates)
- DR-based recommendation changes might be misclassified (might be relative E-based)
- Misclassification biases the results against finding a difference in market reaction and understates our results.
- How large this potential bias?



First approach: Control for changes in the market's estimates in regressions

- ◆ Prior changes in consensus earnings estimates
 - ◆ Prior changes in recommendations
 - ◆ Prior changes in stock prices
- From results of Table 3: Does not affect the spread in the reaction between earning- based and discount-rate-based recommendations



Second approach: Compare reaction to recommendation changes above and below consensus

- If analyst's previous earnings estimate $>$ consensus
 - ◆ then she may upgrade to reiterate her relative earnings optimism (and possibly be classified as Earnings-based recommendation)
- But if her previous earnings estimate $<$ consensus
 - ◆ then the upgrades is not b/c her earnings estimates are better than the market (they are worse) but more likely b/c of her DR decreases
- Thus if market movement in earnings expectations (relative to that of the analyst) play a significant role-- the market reaction should be bigger for upgrades where earnings were above the consensus.
- Same logic but opposite direction for downgrades



[T4] Testing Whether Discount Rate-Based Recommendation Changes Are Driven By implicit changes in earnings

	Excess returns for upgrades during		Excess returns for downgrades during	
	[-1,0]	[+1,+21]	[-1,0]	[+1,+21]
Previous earnings above the consensus dummy	-0.048	0.043	0.096	-0.117
(Control variables not shown)				

Key takeaways:

- Market reaction isn't different, control variables do not affect the spread
- Hence, rec changes with no earnings changes more likely to be driven by changes in discount rates



The Role of Growth Rates

- A priori, growth rates estimates are based on soft information, less verifiable (than short-term earnings), and have long horizon. Similar to discount rate estimates.
- In our I/B/E/S sample, 62% of obs have growth rates of which 5% have growth rate changes, 57% report no change in growth.
- In our 150 analyst reports, corresponding figures 51% of obs have growth rates of which 3% have growth rate changes
- Questions
 - Are growth rate changes the same as discount rate changes?
 - Are earnings-based recommendation changes simply a double signal (earnings plus recommendations) versus discount rate-based recommendation changes (recommendations only)?



Growth rate changes: No restrictions [T2] vs. equal to zero [T5]

	[-1,0]		[+1,+21]	
	Full sample	No growth rate chgs sub-sample	Full sample	No growth rate chgs sub-sample
Upgrades				
With earnings increases	3.55	3.81	1.83	1.83
With no earnings changes	2.13	2.23	0.65	0.76
Downgrades				
With no earnings changes	-1.72	-1.77	-0.79	-0.65
With earnings decreases	-5.11	-5.50	-1.24	-1.22

- Firms with no growth rate changes have similar pattern as the overall sample, suggesting the impact of growth is not overwhelming



Impact of growth rate changes (T-5)

	Observations	Excess returns during [-1,0]	Excess returns during [+1,+21]
Upgrades			
With earnings increases and			
No growth rate changes	9,868	3.81	1.83
Growth rate increases	1,102	3.91	1.61
Difference		-0.10	0.22
With no earnings changes and			
No growth rate changes	17,705	2.23	0.76
Growth rate increases	516	2.21	0.50
Difference		0.02	0.26
Downgrades			
With no earnings changes and			
No growth rate changes	21,318	-1.77	-0.65
Growth rate decreases	564	-2.21	-0.59
Difference		0.44	-0.06
With earnings decreases and			
No growth rate changes	13,406	-5.50	-1.22
Growth rate decreases	1,993	-7.25	-0.46
Difference		1.75***	-0.76**



Summary: How important are growth rate estimates?

- Growth rate changes are rare. Most analysts do not change their growth rates estimates when changing their stock recommendations.
- restricting the sample to no-change-in-growth-rates-estimates yield the same the outcome as for the whole sample, implying growth rate estimate changes do not have strong impact on our results.
- Direct examination of the incremental impact of growth rate changes (6,638 obs.) reveal they have only a minor impact on both Earnings based recommendations and on Discount rate based recommendations.
- Are earnings-based recommendation changes simply a double signal (earnings plus recommendations) versus discount rate-based recommendation changes (recommendations only)?
 - Doesn't look like it. Also the pair of (recommendation + growth change) is a double signal and yet, not the same reaction as the pair of (recommendation + earning change)



Big recommendation changes, big earnings changes, and earnings estimate changes relative to the consensus

- Big recommendation changes
 - Measure recommendation changes on a three-point rating scale
 - Define big recommendation changes are two-point recommendation changes
- Big earnings changes
 - Measure earnings estimate changes (scaled by stock price)
 - Define big earnings changes as earnings changes above the median earnings



Earnings relative to consensus earnings

- The degree of informativeness might be also a function of relative earnings estimate changes
 - Earnings increase to above the consensus
 - Earnings decrease to below the consensus
- Definition of relative earnings estimate changes
 - If FY1 increases, does FY1 end up above/below consensus?
 - If FY1 decreases, does FY1 end up above/below consensus?



[T6A] Stock Returns for Big Recommendation Changes and Big Earnings Changes

	Excess returns for upgrades during		Excess returns for downgrades during	
	[-1,0]	[+1,+21]	[-1,0]	[+1,+21]
Earnings increase dummy	0.807***	0.803***		
Earnings increase and big recommendation change dummy	-0.086	0.342		
Big earnings increase	0.995***	0.938***		
No earnings changes and big recommendation change dummy	0.150	0.637***	-0.041	-0.249
Earnings decrease dummy			-1.710***	-0.446***
Earnings decrease and big recommendation change dummy			-0.400***	-0.270
Big earnings decrease			-2.250***	0.015

(Control variables not shown)



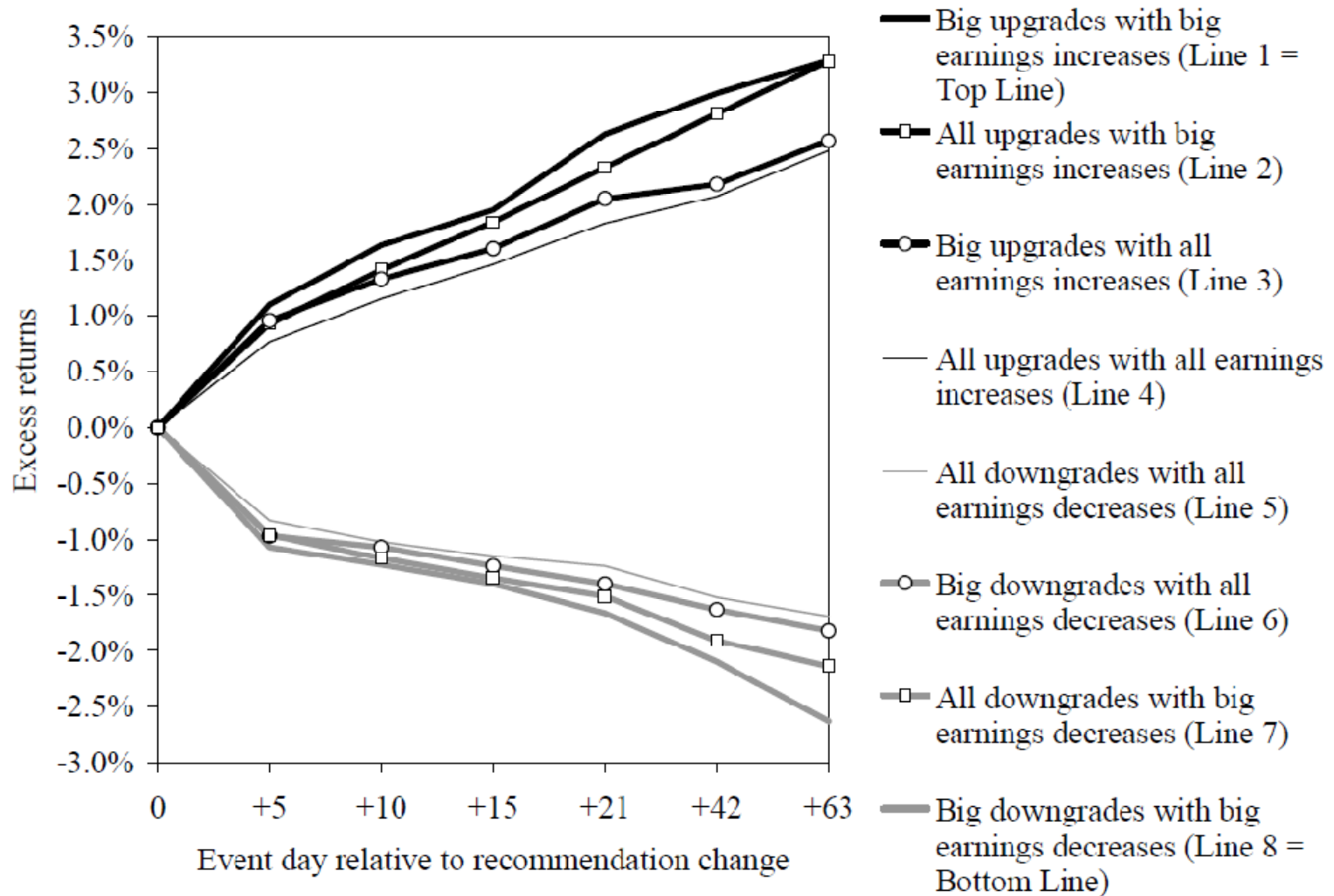
[T6B] Stock Returns for Earnings Estimate Changes Relative to the Consensus

	Excess returns for upgrades during		Excess returns for downgrades during	
	[-1,0]	[+1,+21]	[-1,0]	[+1,+21]
Earnings increased dummy	0.950***	0.617***		
Earnings increased to above the consensus dummy	0.542***	1.033***		
Earnings decreased			-3.375***	-0.471***
Earnings decreased to above the consensus dummy			1.816***	0.114

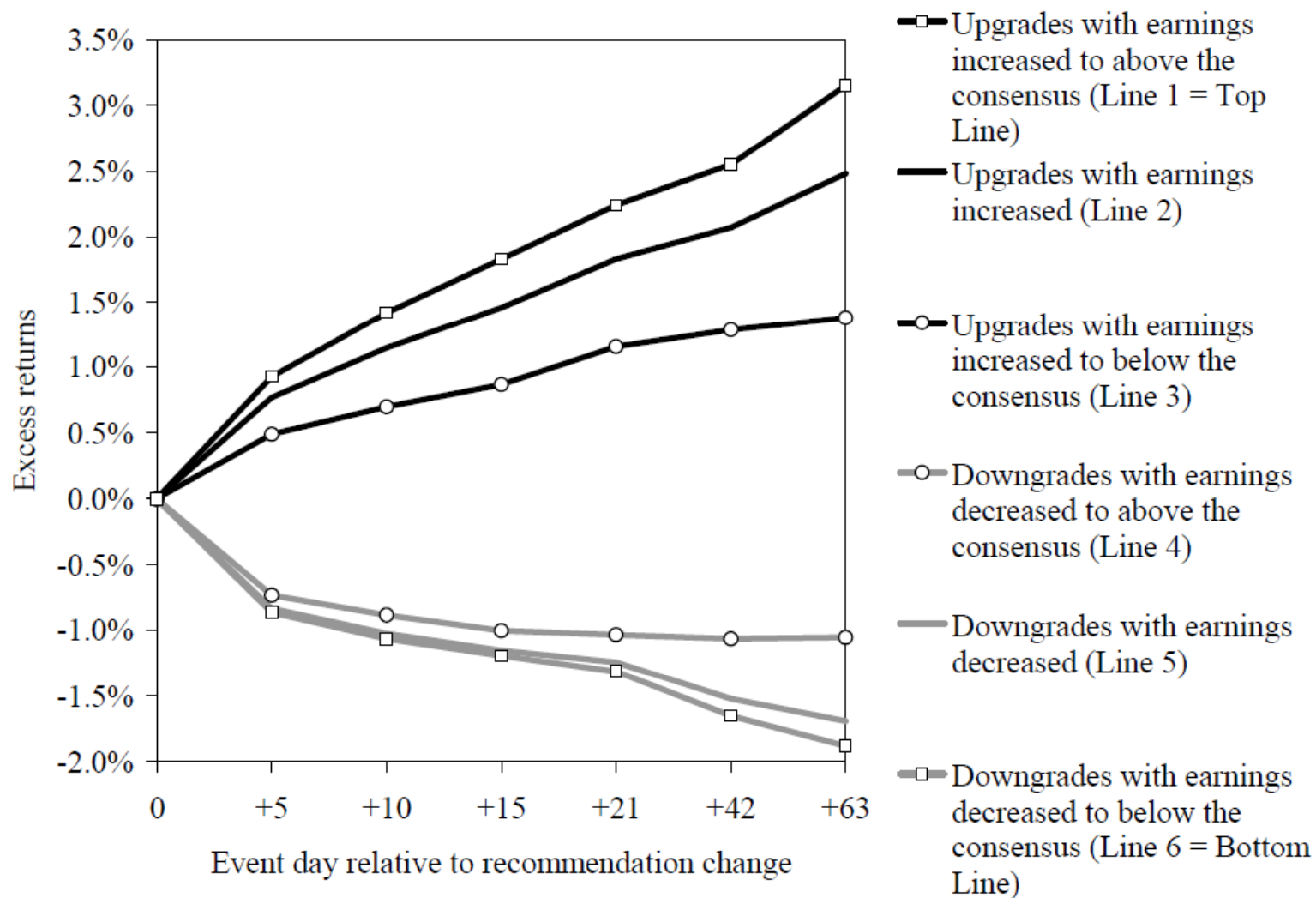
(Control variables not shown)



[F2A] Stock returns for big recommendation changes and big earnings changes



[F2B] Stock returns for earnings estimate changes relative to the consensus



Robustness Tests

1. Contemporaneous earnings announcements (exclude them)
2. Earnings surprises during the previous quarter (post-recommendation drift and post-earnings announcement drift)
3. Star analysts
4. Unobserved analyst heterogeneity (analyst fixed effects)
5. Unobserved broker heterogeneity (broker fixed effects)
6. Level of previous recommendation
 - Structural changes in the equity research industry (Regulation FD and Global Settlement)
 - Clustering of observations (by firm-date-rec chg category)



[T7] Robustness tests

	Earnings announcements	Previous earnings surprises	Star analysts	Analyst fixed effects	Broker fixed effects	Previous rec level
Panel A: Excess returns during [-1,0] for Upgrades						
Earnings increases dummy	0.808*** (11.225)	0.810*** (11.076)	1.251*** (17.919)	1.147*** (16.390)	1.211*** (18.141)	1.276*** (19.334)
Panel B: Excess returns during [+1,+21] for Upgrades						
Earnings increases dummy	1.270*** (9.267)	1.244*** (8.839)	1.239*** (9.914)	1.207*** (9.577)	1.268*** (10.589)	1.234*** (10.594)
Panel C: Excess returns during [-1,0] for Downgrades						
Earnings decreases dummy	-2.928*** (-33.698)	-2.901*** (-33.120)	-2.920*** (-35.339)	-2.566*** (-31.480)	-2.525*** (-32.475)	-2.925*** (-37.148)
Panel D: Excess returns during [+1,+21] for Downgrades						
Earnings decreases dummy	-0.432*** (-3.317)	-0.482*** (-3.617)	-0.412*** (-3.396)	-0.576*** (-4.644)	-0.495*** (-4.207)	-0.443*** (-3.887)



Trading Strategy

- Form calendar-time long minus short portfolios
- Two strategies
 - Buy all upgrades and sell all downgrades (unconditional strategy)
 - Buy all upgrades with earnings increased and sell all downgrades with earnings decreased (conditional strategy)
- Robustness
 - Exclude observations for firms with prices less than \$5 or market cap in the bottom NYSE cap quintile



[T8 & T9] 10-day portfolio holding period

Portfolio type	Number of daily returns	Mean number of firms	Means of the following statistics			
			Mean (standard deviation) of raw daily returns	Holding period raw return (%)	Four-factor alpha (t-statistic) from daily returns	Holding period four-factor alpha (%)
Buy (sell) all upgrades (downgrades)						
Long	3,505	16.1	0.107 (1.438)	1.070	0.076 (4.73)	0.764
Short	3,512	19.0	-0.056 (1.476)	-0.556	-0.077 (-4.58)	-0.770
Long-short	3,503	35.1	0.163 (1.312)	1.629	0.154 (6.92)	1.536
Buy (sell) all upgrades (downgrades) with earnings increased (decreased)						
Long	3,366	5.4	0.169 (1.912)	1.687	0.131 (4.61)	1.314
Short	3,470	7.0	-0.098 (1.994)	-0.984	-0.114 (-4.07)	-1.143
Long-short	3,331	12.4	0.268 (2.279)	2.677	0.247 (6.27)	2.469



[T8 & T9] 21-day portfolio holding period

Means of the following statistics						
Portfolio type	Number of daily returns	Mean number of firms	Mean (standard deviation) of raw daily returns	Holding period raw return (%)	Four-factor alpha (t-statistic) from daily returns	Holding period four-factor alpha (%)
Buy (sell) all upgrades (downgrades)						
Long	3,494	16.1	0.083 1.436	1.744	0.052 (3.24)	1.097
Short	3,501	19.0	-0.023 (1.460)	-0.492	-0.044 (-2.72)	-0.923
Long-short	3,492	35.1	0.106 (1.293)	2.224	0.095 (4.36)	2.005
Buy (sell) all upgrades (downgrades) with earnings increased (decreased)						
Long	3,355	5.4	0.134 (1.937)	2.806	0.095 (3.35)	1.996
Short	3,459	6.9	-0.050 (1.972)	-1.044	-0.065 (-2.38)	-1.375
Long-short	3,320	12.4	0.182 (2.285)	3.825	0.160 (4.08)	3.366

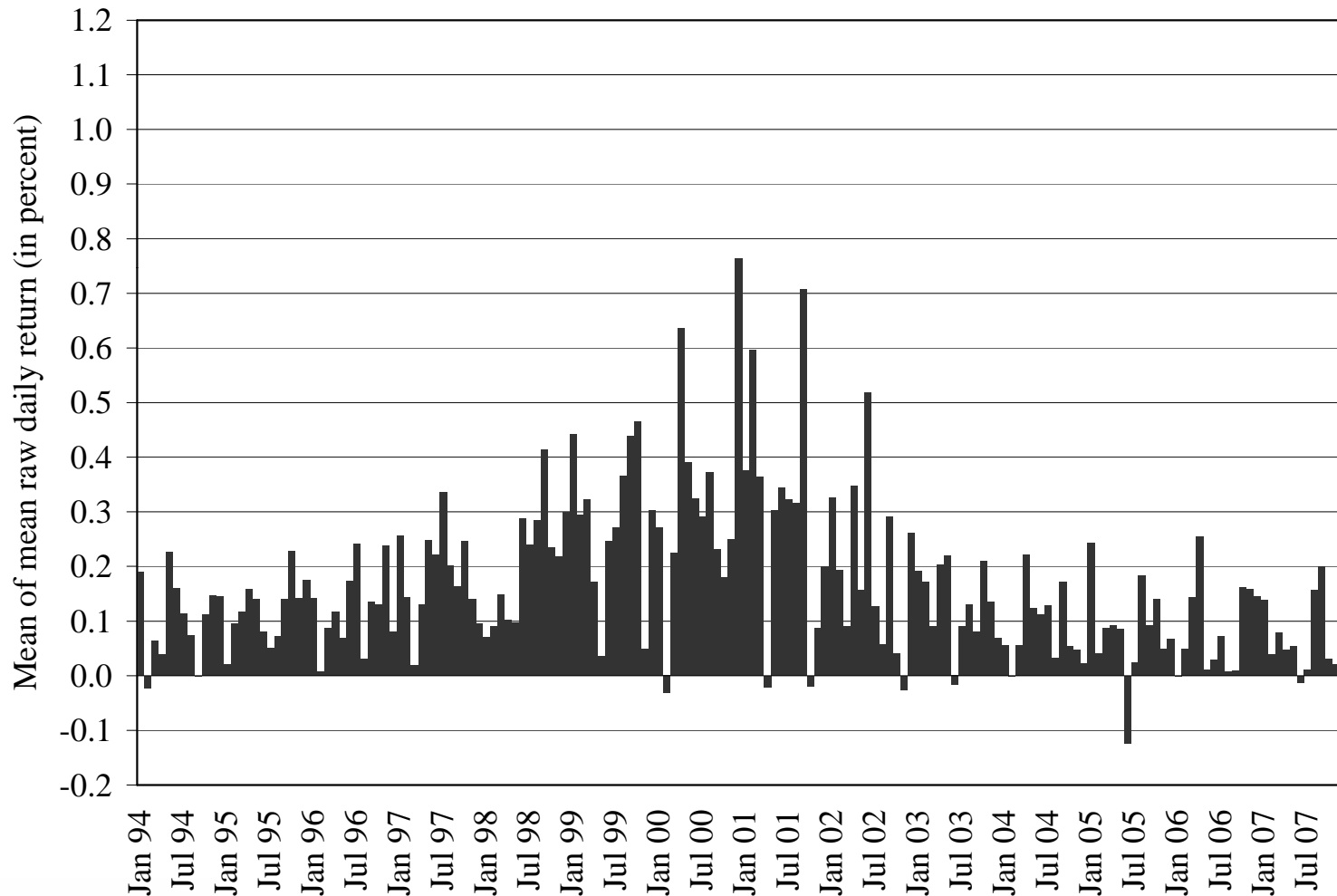


Changes in drift through sample period

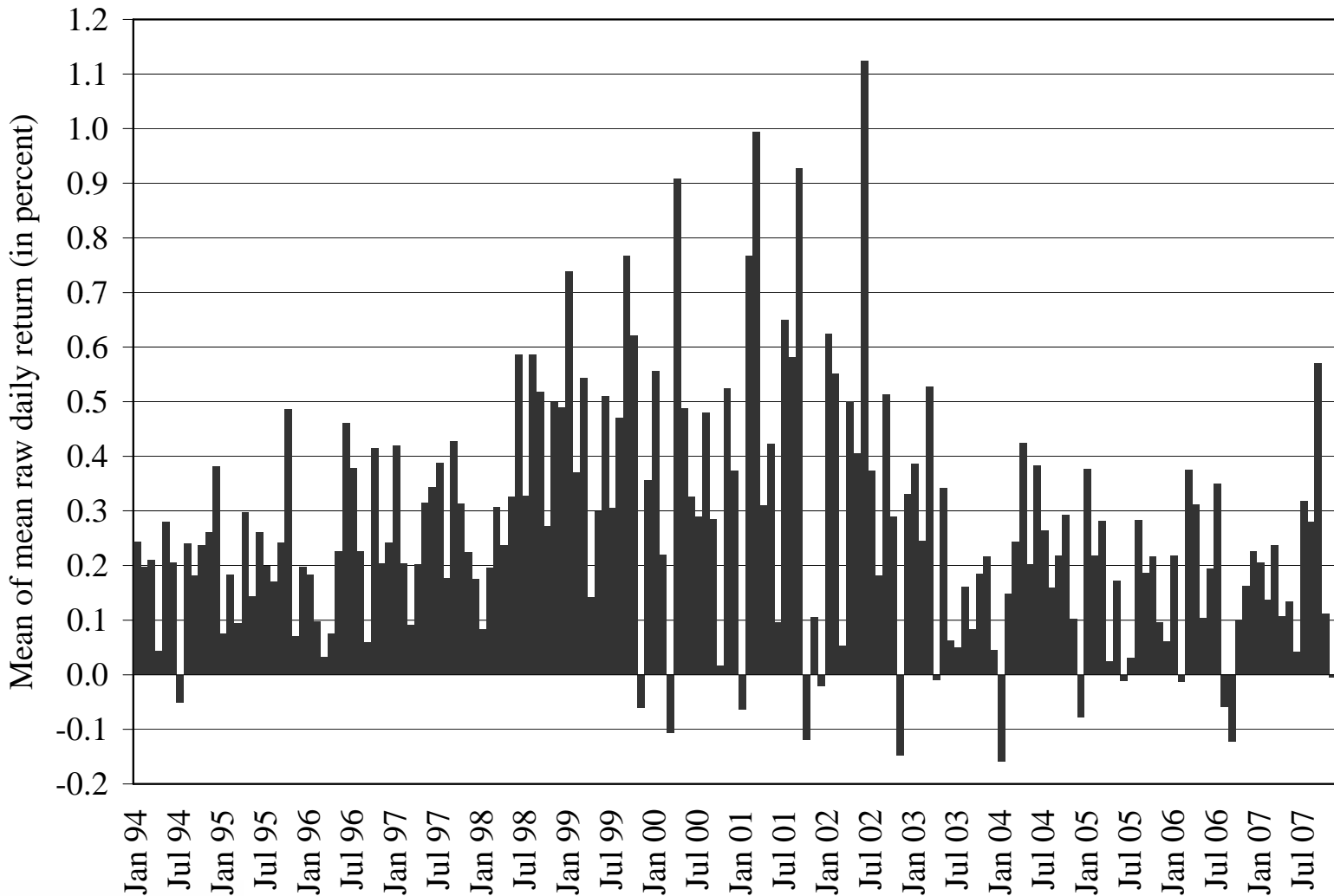
- Same two strategies as before
- Sample period is 1994 to 2007
- Drift during $[+1,+10]$
- Does drift get arbitrated away?



[F3] Drift during [+1,+10] for unconditional strategy



[F3] Drift during [+1,+10] for conditional strategy



Summary and Conclusion

- Any valuation model is based (explicitly or implicitly) on expected cash flows and expected discount rate
- Any change in recommendation by analysts is based (explicitly or implicitly) on differences between the analyst and the market regarding expected cash flows and/or expected discount rate
- Estimates based on hard information, that are verifiable, and for shorter forecast horizons are easier to estimate and are also less subject to cognitive biases and conflict of interests
- Earnings-based recommendations have greater information content and greater investment value than discount rate-based recommendations



Summary and Conclusion

- The economic difference between earnings based recommendations and discount rate based recommendations is consistent with standard economic models and agents' behavior.
- What is more surprising is that the investment value emerging out of these findings is so large and persists through time.
- Finally, one may ask why analysts don't issue more earnings based recommendations
 - ◆ Equilibrium
 - ◆ Analysts' perception

