Complicated firms

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Contents

Introduction – Backgrounds

- If investors have limited resources and capacity to collect, interpret, and finally trade on value-relevant information, we would expect asset prices to incorporate information only gradually.
- Investors' limited attention to information
  - Theoretical: Merton, 1987; Hong and Stein, 1999; Hirshleifer and Teoh, 2003
  - Empirical: Huberman and Regev (2001), Barber and Odean (2008), DellaVigna and Pollet (2006), Hou (2007), Menzly and Ozbas (2006), Hong, Torous, and Valkanov (2007), and Cohen and Frazzini (2008)

- Investors' biased interpretations of information:
  - Attach too high a precision to their prior beliefs and private signals: Kahneman and Tversky (1974) and Daniel, Hirshleifer, and Subrahmanyam (1998)
  - Underreact to firm-specific public information and corporate events: Chan, Lakonishok, and Sougiannis (2001), Ikenberry and Ramnath (2002), Hirschey and Richardson (2003), Kadiyala and Rau (2004), and Zhang (2006)
- Diversification discounts of conglomerate firms
  - Average valuation differences (i.e., ''discounts'') between diversified and their corresponding focused firms: Lamont and Polk (2001)

Introduction – Research Problem

- Whether simple firms' return could predict complicated ones?
  - Yes
- If yes, what's the underlying mechanism?
  - Information processing channel

Research Design – Data

- Sample period: 1977 ~ 2009 (segment reporting from 1976)
- All firms are required to report relevant financial information of any industry segment that comprises more than 10% of firm's total consolidated yearly sales.
- Compustat segment files
- Industry: two-digit SIC codes/one-digit SIC from Fama
  - Standalone firm: operate in only one industry and segment sales account for more than 80% of the total.
  - Conglomerate firm: in multiple industries and aggregate sales from all reported segments account for more than 80% of the total sales.

- Stock files: CRSP
  - Require firms to have non-missing market equity and book equity data at the end of the last year.
  - At least a six-month gap between firm fiscal-year ends and stock returns
  - use segment financial information from a fiscal year only after June of the following year
  - Exclude from our sample those stocks that are priced below five dollars a share at the beginning of the holding period

- Analyst earnings forecast: IBES
  - calculate the consensus analyst forecast revision by taking either the mean or medium forecast revision across all analysts, and standardize it by the lagged stock price
- Sample size: 98000 distinct firm-year observations (68000 standalones & 30000 conglomerate)

Research Design

- Main result: portfolio test
- Mechanism:
  - More complicated firms
  - Difficult-to-arbitrage firms
  - Investors' inattention
  - Firms switch status
  - Analyst information
- Sentiment and categorical thinking

Research Design

- Portfolio test
- At the end of June in each year, construct a "pseudo-conglomerate" for each conglomerate
- The conglomerate firm's industry segments constructed using solely the standalone firms (easy-to-analyze firms) in each industry
- The segment portfolios are then weighted by the percentage of sales contributed by each industry segment within the conglomerate

- Strategy:
- Use segment information from the previous fiscal year, we sort all conglomerate firms into deciles based on the returns of their corresponding pseudo-conglomerate portfolios in the previous month
- Rebalance at the beginning of each month

- Regression tests (Fama-Macbeth)

Mechanism:

- Complicated firms
  - The more complicated the firm, the more severe the lag in incorporating information into prices, and thus the stronger the return predictability
  - Measure how complicated: Herfindahl index
- Difficult-to-arbitrage firms
  - The more binding limits to arbitrage, the stronger return effect, as more sophisticated investors are less able to fully update these firms' prices
  - Idiosyncratic volatility/ firm size

- Investors' inattention
  - Stronger return predictability for conglomerate firms that attract less investor attention
  - Institutional investor ownership/ turnover/ analyst coverage
- Change of firm status
  - Change status within 3 years, eg mergers and acquisitions, and initializing new business lines
  - For conglomerate: its corresponding pseudo-conglomerate should be a significant and positive predictor of its future price movements
  - For standalone: the analogous pseudo-conglomerate portfolio (all other standalones in the same industry) should have relatively weaker predictability

- Analyst information updating in complicated firms
  - Analysts also have limited information processing capacity, but trading frictions doesn't affect analysts.
  - Sell-side analysts who usually cover both simple and complicated firms
  - Test whether analysts' earnings forecast revisions (instead of stock return), aggregate into pseudo-conglomerate forecast (PCFt-1), predict future forecast revisions of their corresponding complicated conglomerate firms (Ft)

- Sentiment test
  - if complicated firms are more difficult to categorize, we expect that sentiment-related return shocks affect simple-to-analyze firms to a larger extent than complicated-to-analyze firms
  - retail investor demand
- Robustness check and return horizon
  - Weekly
  - Weight each industry based on segment assets
  - Cumulative return responses of conglomerate firms over an extended horizon

Empirical Results

Table 2 Complicated processing portfolios, abnormal returns 1977–2009

Decile	Excess returns	1-Factor alpha	3-Factor alpha	4-Factor alpha	5-Factor alpha
Panel A: Equal weights					
1	0.14%	−0.47%	−0.71%	−0.61%	−0.65%
(Low)	(0.43)	(−2.83)	(−4.80)	(−4.01)	(−4.39)
2	0.08%	−0.50%	−0.73%	−0.64%	−0.68%
	(0.28)	(−3.57)	(−5.94)	(−5.35)	(−5.90)
3	0.50%	−0.03%	−0.25%	−0.18%	−0.20%
	(1.85)	(−0.25)	(−2.30)	(−1.63)	(−1.85)
4	0.67%	0.14%	−0.09%	0.00%	−0.01%
	(2.48)	(1.11)	(−0.82)	(0.01)	(−0.09)
5	0.85%	0.34%	0.11%	0.18%	0.19%
	(3.26)	(2.83)	(1.16)	(1.90)	(1.96)
6	0.85%	0.32%	0.08%	0.15%	0.15%
	(3.20)	(2.72)	(0.84)	(1.54)	(1.50)
7	0.90%	0.37%	0.13%	0.15%	0.16%
	(3.38)	(3.11)	(1.36)	(1.43)	(1.57)
8	0.97%	0.44%	0.21%	0.22%	0.24%
	(3.63)	(3.67)	(2.15)	(2.00)	(2.20)
9	0.99%	0.46%	0.24%	0.24%	0.25%
	(3.66)	(3.61)	(2.23)	(2.12)	(2.12)
10	1.31%	0.74%	0.48%	0.47%	0.47%
(High)	(4.34)	(4.63)	(3.63)	(3.30)	(3.09)
L/S	**1.18%**	**1.21%**	**1.18%**	**1.08%**	**1.12%**
	(5.51)	(5.52)	(5.30)	(4.48)	(4.50)

Table 4 Complicated processing returns, cross-sectional regressions 1977–2009

Dep variable	RET_t		RET_t -$INDRET_t$		$RET_t - PCRET_t$	
*100	(1)	(2)	(3)	(4)	(5)	(6)
$PCRET_{t-1}$	**7.408**	**6.896**	**3.047**	**4.652**	**3.260**	**4.098**
	(5.84)	(6.67)	(2.72)	(5.35)	(2.56)	(3.21)
RET_{t-1}		**−4.422**		**−4.183**		**−4.583**
		(−6.88)		(−6.72)		(−7.18)
$INDRET_{t-1}$		**4.783**		−1.341		−0.296
		(3.85)		(−1.27)		(−0.25)
SIZE	−0.052	−0.048	−0.029	−0.023	−0.034	−0.031
	(−1.24)	(−1.12)	(−1.49)	(−1.05)	(−1.56)	(−1.32)
B/M	**0.212**	**0.229**	**0.209**	**0.225**	**0.217**	**0.234**
	(2.35)	(2.50)	(2.93)	(3.02)	(2.91)	(3.02)
MOM	**0.285**	**0.283**	**0.296**	**0.311**	**0.265**	**0.270**
	(2.51)	(2.46)	(2.89)	(3.02)	(2.45)	(2.54)
TURNOVER	**−0.027**	**−0.029**	**−0.025**	**−0.027**	**−0.029**	**−0.031**
	(−3.36)	(−3.51)	(−3.67)	(−3.88)	(−3.92)	(−4.09)
Adj R^2	0.06	0.07	0.03	0.04	0.03	0.04

RET-INDRET: excess conglomerate return over its value-weighted industry return

RET-PCRET: excess return of the conglomerate over its paired pseudo-conglomerate

Table 5 Level of complexity in complicated firms, 1977–2009.

Dep variable	Conglomerate return (t)					
*100	(1)	(2)	(3)	(4)	(5)	(6)
$PCRET_{t-1}$	**8.504**	**5.995**	**8.456**	**7.871**	**7.033**	**6.720**
	(5.77)	(4.60)	(5.09)	(5.38)	(5.24)	(6.23)
$PCRET_{t-1}$* *Herfindahl > median*	**−3.458**					
	(−3.33)					
$PCRET_{t-1}$* *Idio vol > median*		**3.159**				
		(2.43)				
$PCRET_{t-1}$* *MktCap > NYSE median*			**−3.181**			
			(−2.23)			
$PCRET_{t-1}$* *Res inst own > median*				−1.698		
				(−1.20)		
$PCRET_{t-1}$* *Turnover > median*					0.361	
					(0.24)	
$PCRET_{t-1}$* *#Analyst > median*						−0.500
						(−0.37)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.09	0.09	0.09	0.08	0.08	0.08

- Firms that are relatively less complicated exhibit less pronounced predictable returns
- Complications in information processing have an even larger impact on difficult-to-arbitrage stocks.
- The return effect is driven by complications in the processing of information for conglomerate firms, and not simply by investors ignoring this underlying information and/or the underlying stocks.

Table 6 Change of status and complicated processing, 1977–2009

Dep variable	Standalone status		Conglomerate status	
*100	RET_t (1)	$RET_t - PCRET_t$ (2)	RET_t (3)	$RET_t - PCRET_t$ (4)
$PCRET_{t-1}$	**5.198**	0.581	**8.768**	**3.206**
	(3.57)	(1.08)	(5.06)	(2.71)
RET_{t-1}	**−4.903**	**−5.874**	**−2.961**	**−3.342**
	(−4.25)	(−5.01)	(−2.15)	(−2.50)
SIZE	−0.054	−0.033	−0.122	−0.092
	(−0.83)	(−0.61)	(−1.53)	(−1.31)
B/M	0.327	0.225	0.505	0.502
	(1.69)	(1.24)	(1.83)	(1.94)
MOM	0.352	**0.382**	1.612	1.526
	(1.50)	(2.17)	(1.21)	(1.31)
TURNOVER	0.010	0.011	0.019	0.001
	(0.37)	(0.49)	(0.45)	(0.03)
Adj R^2	0.18	0.13	0.17	0.15

- Significant return predictability when the same firm is a more complicated conglomerate firm

Table 7 Analyst compounding of information, 1984–2009

Dep variable *100	F_t (1)	F_t (2)	PCF_t (3)
PCF_{t-1}	**6.389**	**5.370**	
	(2.76)	(2.51)	
F_{t-1}		**37.014**	0.682
		(19.84)	(0.31)
$INDF_{t-1}$	**38.558**	**9.651**	**32.788**
	(8.53)	(2.57)	(17.25)
SIZE	**0.033**	**0.022**	**0.010**
	(8.25)	(8.25)	(7.29)
B/M	**−0.047**	**−0.040**	**−0.010**
	(−3.16)	(−3.71)	(−2.10)
MOM	**0.100**	**0.056**	0.005
	(5.31)	(4.37)	(0.84)
TURNOVER	**−0.002**	**−0.001**	**0.000**
	(−2.34)	(−2.06)	(−2.11)
Adj R^2	0.12	0.19	0.21

- The return predictability pattern we show in this paper is more consistent with the complicated-information-processing channel, and less so with complications in trading.

Table 8 Industry sentiment, cross-sectional regressions 1983–2000.

The aggregate sentiment shocks for the conglomerate firm's component industries.

Dep variable *100	$PCRET_t$ (1)	RET_t (2)	RET_t-$PCRET_t$ (3)
Panel A: Industry sentiment on future returns			
$PCIMBL_{t-1}$	−0.090	0.023	**0.113**
	(−1.81)	(0.45)	(2.08)
$IMBL_{t-1}$		**−0.036**	**−0.037**
		(−2.11)	(−2.23)
RET_{t-1}	0.160	**−4.320**	**−4.479**
	(0.88)	(−6.01)	(−6.16)
$INDRET_{t-1}$	**6.206**	**9.529**	**3.323**
	(4.68)	(6.26)	(2.63)
SIZE	0.011	0.044	0.033
	(0.25)	(0.68)	(0.86)
B/M	−0.003	**0.373**	**0.376**
	(−0.03)	(2.99)	(3.51)
MOM	0.062	**0.437**	**0.375**
	(1.10)	(2.80)	(2.64)
TURNOVER	−0.046	**−0.295**	**−0.248**
	(−1.12)	(−2.35)	(−2.38)
Adj R^2	0.11	0.07	0.05

Panel B: Industry sentiment on contemporaneous returns

$PCIMBL_t$	**1.233**	−0.419	**−1.652**
	(2.53)	(−1.11)	(−2.38)
$IMBL_t$		**3.017**	**3.004**
		(4.34)	(4.03)
RET_{t-1}	0.456	**−4.070**	**−4.526**
	(0.70)	(−5.02)	(−5.35)
$INDRET_{t-1}$	**9.384**	**10.495**	1.111
	(4.84)	(7.26)	(0.59)
SIZE	−0.027	0.061	0.088
	(−0.63)	(1.01)	(1.28)
B/M	0.112	**0.636**	**0.524**
	(1.20)	(4.04)	(3.41)
MOM	−0.058	**0.319**	**0.377**
	(−1.03)	(2.37)	(2.74)
TURNOVER	−0.002	**−0.598**	**−0.595**
	(−0.07)	(−3.43)	(−3.62)
Adj R^2	0.15	0.09	0.07

- We find that difficult-to-categorize firms are not subject to the shift away from fundamental value due to sentiment, nor do they experience the subsequent reversal back to fundamental value

Robustness

Table 10 Cross-sectional regressions, weekly returns, 1977–2009.

Dep variable *100	RET_t (1)	RET_t (2)	RET_t (3)	RET_t (4)
$PCRET_{t-1}$	**2.558** (7.29)			
$PCRET_{t-2}$		**1.860** (6.65)		
$PCRET_{t-3}$			**1.260** (5.03)	
$PCRET_{t-4}$				**1.019** (4.53)
CONTROLS	Yes	Yes	Yes	Yes
Adj R^2	0.06	0.05	0.05	0.05

Conclusion

- Easy-to-analyze firms incorporate industry information first, and hence, their returns strongly predict the future updating of firm values that require more complicated analyses.
- The more complicated the firm, the more pronounced the return predictability.