Informed Trading by Non-Financial Companies

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Abstract

It is well documented in the finance literature how share prices go up when companies increase dividend payouts. The long-term trend, however, is that more companies now retain excess cash rather than paying dividends. In this paper I investigate if companies retain cash to invest on private information in domestic stock markets. I look at 20,620 domestic non-financial companies trading shares on the Oslo Stock Exchange (OSE) over the period 1993 to 2006. I find that companies earn excess risk-adjusted-returns from active trading. I conclude that companies retain at least some cash to take advantage of private information.

JEL classification: G11, G14, G15

Keywords: Companies, Portfolio choice, Portfolio performance

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1. Introduction

It is well documented in the finance literature how in recent years few companies pay dividends to shareholders; see Fama and French (2001) and DeAngelo, DeAngelo, and Skinner (2004). This observation is puzzling given the empirical evidence linking payouts to positive stock-price reactions; see Grullon, Michaely and Swaminathan (2002). The argument for retaining cash is to maintain financial slack for future investment needs and potential financial distress; see Berk and DeMarzo (2016). If cash is retained to maintain financial slack, companies should arguably invest in well diversified portfolios to optimize risk-return characteristics; see Markowitz (1952). Another possibility, however, is that companies retain cash to trade on private information in stock markets. If trading on private information is the purpose, we should see that companies earn excess risk-adjusted-returns from active portfolio investments.

Investigating this question has in the past been hampered by the lack of readily available data on the portfolio holdings of many companies over a long period of time. In this paper I investigate unique data from the OSE VPS database which includes 20,620 domestic non-financial companies with 1.2 million investor-month portfolio holdings from January 1993 to July 2006. I only include non-financial (industrial) companies in the sample to make sure that I only look at investors trading their own excess funds not needed for normal business operations.

My main empirical finding is that companies who increase portfolio concentration (active management) by one-standard-deviation increase annual risk-adjusted-returns by 2.2%. I calculate portfolio concentration following Choi, Fedenia, Skiba, and Sokolyk (2017) as the investor portfolio weights in deviation from the market value weights.

Following Choi et al. (2017) I regress portfolio monthly excess returns on investor portfolio concentration, investor size (portfolio value), the number of actual stock investments, a binary variable taking the value of one for publicly traded companies, traditional risk factors (RM-RF, SMB, HML, Momentum), as well as various fixed effects. Any relation between return and portfolio concentration is therefore in excess of what is expected based on portfolio size, the number of investments, public status, portfolio risk characteristics, and time effects.

I only observe shares held on the OSE. It is possible that investors hold their OSE portfolio as part of an internationally diversified portfolio. Treynor and Black (1973) explain that the information ratio can be used to evaluate the contribution of a subsection of a portfolio to an overall diversified portfolio. I find that non-financial companies who increase portfolio concentration also increase information ratios.

I conclude that non-financial companies retain cash to trade on private information in domestic stock markets.

I contribute to a large area of the literature that investigates cash retention and payout policy. DeAngelo et al. (2004) document that only a small fraction of companies pays dividends to shareholders. This finding is puzzling as Grullon et al. (2002) document that stock prices go up when companies increase dividends. I document a positive relation between concentration and return which shows that companies retain cash because they have private information about stock markets.

I also contribute to the literature that investigates the relation between portfolio concentration and stock-market returns. Kacperczyk, Sialm, Zheng (2005), Ivković, Sialm, and Weisbenner (2008), and Choi et al. (2017) document how mutual funds, retail investors, and large international institutional investors improve returns from portfolio concentration, respectively.

Fjesme (2018a) show that the relation between portfolio concentration and return is stronger for institutional investors than for retail investors while Fjesme (2018b) show that government related investors reduce return from portfolio concentration. I show that domestic non-financial (industrial) companies increase risk-adjusted-returns from placing retained cash in highly concentrated portfolios.

2. Related literature and hypothesis development

Miller and Modigliani (1961) show theoretically that paying dividends does not change company value under perfect and complete capital market assumptions. However, market imperfections such as taxes, bankruptcy costs, agency costs, and asymmetric information means that increasing dividends can increase company value. Berk and DeMarzo (2016) explain that companies can rationally retain some cash to maintain financing slack for future positive NPV projects or avoiding financial distress. Markowitz (1952), Markowitz (1959), and Tobin (1958) explain that investors who place cash in stock markets will optimize portfolio risk-return characteristics by holding the market portfolio.

There are many papers that empirically document the benefits to companies from paying dividends. Grullon et al. (2002) show that stock markets react positively to dividend increases and negatively to dividend decreases while Charest (1978) show that companies have positive long-run returns following dividend increases and negative long-run returns following dividend decreases.

Based on Berk and DeMarzo (2016) and Grullon et al. (2002) I expect that non-financial companies will pay out cash not needed to maintain financial slack to shareholders. Based on

Markowitz (1952) I expect that any retained cash invested in stock markets will be placed in the market portfolio. I formalize this as hypothesis H1.

H1: Non-financial companies who invest on the OSE will hold the market portfolio.

Van Nieuwerburgh and Veldkamp (2009 and 2010) show that investors can learn about assets before they invest. With information learning rational investors will move away from the market portfolio by concentrating investments in assets with more information. Hendershott, Livdan, and Schurhoff (2015) show that institutional investors can have private information about companies before it becomes publicly available. Based on Van Nieuwerburgh and Veldkamp (2009) and Hendershott et al. (2015) I expect that companies retain cash to invest in stock markets on private information. If non-financial companies retain cash to invest on private information, I expect that they will hold concentrated (active) portfolios and earn excess returns from this concentration. I formalize this as hypothesis H2.

H2: Non-financial companies earn positive risk-adjusted-returns from portfolio concentration on the OSE.

3. The Oslo Stock Exchange

The OSE is similar to other US and European Union stock exchanges as the OSE is regulated under the European Union regulation of financial instruments. However, one key distinction is that companies listing on the OSE must as part of the listing process register all shareholders into the OSE VPS database. Portfolio holdings are continually updated in the data through market trading.

From the OSE VPS I observe all investor portfolios at the beginning of the calendar month and returns during the month from January 1993 to July 2006 (when the data supply is stopped). From the OSE VPS I can then investigate the relation between portfolio weights and returns for all non-financial institutional investors on the OSE. Actual and complete portfolio holdings are in general difficult to obtain.

4. Data

Table 1 shows the number of companies trading on the OSE over the sample period. Table 2 shows descriptive statistics for the 1,228,551 investor-month portfolio observations. The average *Return, Concentration, Portfolio, N. Companies, and Public* are 1.23%, 0.950, $1.891 USD million, 3.387 companies, and 0.8% public, respectively. Table 3 shows that the variables are very similar when averaged by each unique investor ID.

5. Empirical results

5.1 The market portfolio

Hypothesis 1 predicts that non-financial companies who invest on the OSE will hold the market portfolio. In Table 4 I compare the investor portfolios to the market portfolio for the 1,228,551 investor-month portfolio observations. From Table 4 we see that the average non-financial company keeps a portfolio with 3.4 companies and a *Concentration* of 0.95. A concentration of 0.95 means that the average investor holds only 5% of the value weighted market portfolio (1.0 – 0.95). This is significantly lower than the average OSE market portfolio of 151 companies and a value weighted concentration of zero. These findings are not consistent with hypothesis 1. I conclude that non-financial companies do not hold the market portfolio on average.

5.2 Portfolio concentration and risk-adjusted-returns

Hypothesis 2 predicts that non-financial companies earn positive risk-adjusted-returns from portfolio concentration on the OSE. Following Choi et al. (2017) using international data and Fjesme (2018a and 2018b) using Norwegian data I regress *Return* on *Concentration* and controls for every company (i) in every calendar month (t) on the OSE over the period 1993 to 2006 using equation (1).

$$Return_{it} = \alpha + \beta_1[Concentration_{it}] + \beta_2[Ln\ (Portfolio_{it})] + \beta_3[N.\ Companies_{it}] + \beta_4[Public_{it}] + \beta_5[RM\text{-}RF_t] + \beta_6[SMB_t] + \beta_7[HML_t] + \beta_8[MOM_t] + Year\ Fixed\ Effects + Investor\ Type\ Fixed\ Effects + e_{it} \quad (1)$$

From Column 1 of Table 5 we see that there is a positive relation between *Return* and *Concentration*. The interpretation is that investors who increase *Concentration* by one-standard-deviation will increase *Return* by 0.18% (0.09 * 2). A monthly increase in *Return* of 0.18% is equivalent to an annual increase in *Return* of 2.18%. The results are consistent with hypothesis 2 which predicts that non-financial companies earn positive risk-adjusted-returns from portfolio concentration on the OSE. I conclude that non-financial companies hold less diversified portfolios on the OSE because they have private information.

To make sure that the results are not driven by investors size I control for the investor portfolio value (*Portfolio*) in all regressions. As many investors also hold very few companies I

control for the actual number of companies in the portfolio (*N. Companies*). Michaely and Roberts (2012) also document that there are some differences in the payout policy of publicly traded and privately held companies. To account for these potential differences, I include the binary variable that takes the value of one for all public companies (and zero else) in all regressions (*Public*). There is a negative relation between *Return* and *Portfolio* and a positive relation between *Return* and *N. Companies*. There is no relation between *Return* and *Public*.

N. Companies and *Concentration* are naturally negatively correlated as they are both calculated from the investor portfolio. In Column 2 of Table 5 I drop *N. Companies* from the analysis. The results remain unchanged. The sample size is naturally very large as I observe all domestic non-financial companies on the OSE. In Column 3 I drop 90% of the sample size at random and redo the analysis. The results remain unchanged. I conclude that the results are not driven by the large sample size or the way I specify the control variables.

5.3 Information ratios

I only observe shares held on the OSE. It is possible that investors hold also other assets in addition to the observed portfolios. Treynor and Black (1973) explain that the information ratio can be used to evaluate the contribution of a specific section of a portfolio to an overall portfolio. In Table 6 I regress the *Information ratio* on *Mean Concentration* and controls for every unique non-financial company on the OSE. I only observe one *Information ratio* per company so I average all control variables by each unique company ID over the sample period.

From Table 6 we see that there is a positive relation between *Information ratio* and *Mean concentration*. The interpretation is that companies who increase the *Mean concentration* by one-standard-deviation will increase the *Information ratio* by 0.034 (0.073 * 0.470). This is also

economically significant given that the average *Information ratio* is -0.094. I conclude that non-financial companies who increase their mean portfolio concentration also increase their information ratios.

6. Conclusion

In this paper I investigate the risk-adjusted-return of domestic non-financial companies trading shares on the OSE. My main finding is that non-financial companies have highly concentrated investment portfolios and that this concentration improves risk-adjusted-returns. I conclude that companies which retain cash rather than paying out to shareholders do this to take advantage of private information in the stock market. The main empirical implication of this finding is that investors should not automatically punish companies that retain cash rather than paying out dividends. I show that companies have private information that improves risk-adjusted-returns. Theoretical implications are that future models on payout policy should include company private information as a reason for retaining cash.

References

Berk, J., and P. DeMarzo, 2016, “Corporate Finance: The Core”, Essex, Pearson.

Charest, G., 1978, "Dividend Information, Stock Returns and Market Efficiency", Journal of Financial Economics 6, 297-330.

Carhart, M., 1997, “On Persistence in Mutual Fund Performance”, Journal of Finance 52, 57-82.

Choi, N., M. Fedenia, H. Skiba, and T. Sokolyk, 2017, “Portfolio Concentration and Performance of Institutional Investors Worldwide”, Journal of Financial Economics 123, 189–208.

Coval, J., and T. Moskowitz, 2001, “The Geography of Investment: Informed Trading and Asset Prices”, Journal of Political Economy 109, 811–841.

DeAngelo, H., L. DeAngelo, and D.J., Skinner, 2004, “Are Dividends Disappearing? Dividend Concentration and the Consolidation of Earnings“, Journal of financial economics 72, 425-456.

Fama, E., and K. French, 1993, “Common Risk Factors in the Returns on Stocks and Bonds”, Journal of Financial Economics 33, 3-56.

Fama, E., and K. French, 2001, “Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?”, Journal of Financial economics 60, 3-43.

Fjesme. S., 2018a, “Foreign Market Portfolio Concentration and Performance”, Financial Management, Forthcoming.

Fjesme. S., 2018b, “Should Local Governments Trade Surplus Funds in the Stock Market?”, Working Paper, Oslo Metropolitan University.

Grullon, G., R. Michaely, and B. Swaminathan, 2002, “Are Dividend Changes a Sign of Firm Maturity?”, Journal of Business 75, 387-424.

Hendershott, T., D. Livdan, and N. Schurhoff, 2015, Are Institutions Informed About News?”, Journal of Financial Economics 117, 249-287.

Ivković, Z., C. Sialm, and S. Weisbenner, 2008, “Portfolio Concentration and the Performance of Individual Investors”, Journal of Financial and Quantitative Analysis 43, 613–656.

Kacperczyk, M., C. Sialm, and L. Zheng, 2005, “On the Industry Concentration of Actively Managed Equity Mutual Funds”, Journal of Finance 60, 1983–2011.

Markowitz, H., 1952, “Portfolio Selection”, Journal of Finance 7, 77 – 91.

Markowitz, H.M., 1959. “Portfolio Selection: Efficient Diversification of Investments”. New York: John Wiley & Sons., reprinted by Yale University Press, 1970, ISBN 978-0-300-01372-6; 2nd ed. Basil Blackwell, 1991, ISBN 978-1-55786-108-5.

Miller, M. H., and F. Modigliani, 1961, “Dividend Policy, Growth, and the Valuation of Shares”, Journal of Business 34, 411-433.

Michaely, R., and R.M. Roberts 2011, “Corporate Dividend Policies: Lessons From Private Firms”, Review of Financial Studies 25, 711-746.

Treynor, J., and F. Black, 1973, “How to Use Security Analysis to Improve Portfolio Selection”, Journal of Business 46, 66–86.

Tobin, J., 1958, “Liquidity Preference as Behavior Towards Risk”, Review of Economic Studies 25, 65-86.

Van Nieuwerburgh, S., and L. Veldkamp, 2009. “Information Immobility and the Home Bias Puzzle”, Journal of Finance 64, 1187–1215.

Van Nieuwerburgh, S., and L. Veldkamp, 2010, "Information Acquisition and Under-diversification", Review of Economic Studies 77, 779-805.

Ødegård, B.A., 2017, "Norwegian Factor Portfolio Returns". Accessed 22.11.2017 from URL http://finance.bi.no/~bernt/financial_data/ose_asset_pricing_data/index.html

Ødegård, B.A., 2016, "Empirics of the Oslo Stock Exchange. Basic, Descriptive Results 1980-2016", Working paper, Stavanger University.

Table 1

Companies per Year

Table 1 shows the public companies quoted on the OSE over the sample period from January 1993 to July 2006. Column 1 is the sample years. Column 2 is the number of quoted companies after dropping companies with low trading volume (less than 20 trading days), penny stocks (share price less than 10 NOK or $1.792 USD), and companies with total value below 1 million NOK ($179,200 USD).

1	2
	Companies
Year	N
1993	106
1994	126
1995	131
1996	147
1997	177
1998	189
1999	169
2000	174
2001	152
2002	130
2003	116
2004	131
2005	163
2006	173

Table 2

Investor-Month Level Descriptive Statistics

Table 2 show descriptive statistics for the investor-month portfolios on the OSE over the sample period January 1993 to July 2006. *Return* is the value weighted investor monthly portfolio return during the calendar month in excess of the risk-free rate. *Concentration* is the investor cumulated absolute monthly company portfolio weights as deviation from the market value weights at the beginning of the calendar month; see Appendix Table A1 for a detailed description of *Concentration*. *Portfolio* is the total investor monthly portfolio value in million USD at the beginning of the calendar month. *N. Companies* are the total number of unique companies in the investor monthly portfolio at the beginning of the calendar month. *Public* is the binary variable that takes the value of one (otherwise) zero for publicly traded companies. Panel A, B, and C show summary statistics, correlations, and percentiles, respectively.

Panel A: Summary				
	N	Mean	St.Dev	Median
Return	1,228,551	1.230	10.688	0.509
Concentration	1,228,551	0.950	0.088	0.990
Portfolio	1,228,551	1.891	32.380	0.034
N. Companies	1,228,551	3.387	4.859	2.000
Public	1,228,551	0.008	0.088	0.000
Panel B: Correlation matrix				
	Return	Concent.	Portfolio	N. Comp.
Return	1.000			
Concentration	-0.003	1.000		
Portfolio	-0.002	-0.035	1.000	
N. Companies	0.002	-0.591	0.096	1.000
Public	0.001	0.006	0.148	0.027
Panel C: Percentiles				
	5th	25th	75th	95th
Return	-14.100	-4.369	6.213	18.210
Concentration	0.756	0.943	0.998	1.000
Portfolio	0.000	0.006	0.187	2.656
N. Companies	1.000	1.000	4.000	12.000
Public	0.000	0.000	0.000	0.000

Table 3

Investor ID Level Descriptive Statistics

Table 3 show descriptive statistics by each unique investor. *Mean Return, Mean Concentration, Mean Portfolio,* and *Mean N. Companies* are the average *Return, Concentration, Portfolio,* and *N. Companies* by each unique investor over the sample period January 1993 to July 2006. The *Information ratio* is calculated as: Average (*RP – RM*) / Standard deviation (*RP – RM*). *RP* and *RM* are the unadjusted company portfolio and market returns, respectively. Investors with less than six months of trading history are dropped. *Information ratio* is winsorized at the 1% level.

	N	Mean	St.Dev	25th	50th	75th
Mean Return	20,620	1.308	2.668	0.324	1.204	2.227
Mean Concentration	20,620	0.956	0.073	0.947	0.986	0.998
Mean Portfolio	20,620	1.734	27.075	0.009	0.044	0.201
Mean N. Companies	20,620	2.975	4.057	1.000	1.583	3.101
Public	20,620	0.008	0.089	0.000	0.000	0.000
Information ratio	20,620	-0.094	0.219	-0.198	-0.076	0.024

Table 4

Portfolio Concentration and Risk-Adjusted-Returns

Table 4 reports descriptive statistics of the non-financial company portfolios. Mean Difference is the difference between Non-financial company portfolios and the market value weighted portfolio. Statistical significance at the 10%, 5%, and 1% level are indicated by *, **, and ***, respectively.

		Non-financial companies		Market Portfolio		Difference	
	N	Mean	St.Dev	Mean	St.Dev	Mean	p-value
Concentration	1,228,551	0.950	0.088	0	0	0.950***	0.000
N. Companies	1,228,551	3.387	4.859	150.9	24.4	-147.5***	0.000

Table 5

Portfolio Concentration and Risk-Adjusted-Returns

Table 5 reports intercept coefficients and robust clustered t-statistics in parentheses for regressions of *Return* on *Concentration* and controls for the 1,228,551 domestic non-financial institutional investor-month portfolio observations on the OSE in the period 1993 to 2006. Standard errors are clustered by investor. All variables are defined in Table 2. Column 2 drop *N. Companies* as a control. Column 3 drops 90% of the sample size at random. Statistical significance at the 10%, 5%, and 1% level are indicated by *, **, and ***, respectively.

	1	2	3
Concentration	2.002***	0.704***	2.390***
	(21.4)	(9.0)	(9.8)
Ln (Portfolio)	-0.037***	-0.013***	-0.019
	-(8.6)	-(3.4)	-(1.6)
N. Companies	0.047***		0.054***
	(18.2)		(10.1)
Public	0.039	0.037	-0.157
	(0.4)	(0.4)	-(0.5)
RM-RF	0.942***	0.942***	0.940***
	(326.1)	(326.1)	(155.6)
SMB	0.212***	0.212***	0.215***
	(58.0)	(57.9)	(21.6)
HML	0.000	0.000	-0.014**
	(0.2)	(0.2)	-(2.2)
MOM	-0.076***	-0.076***	-0.082***
	-(28.0)	-(28.0)	-(11.8)
Constant	-1.703***	-0.240***	-2.212***
	-(16.8)	-(3.0)	-(8.4)
N	1,228,551	1,228,551	122,855
Year FE	Yes	Yes	Yes
Investor type FE	Yes	Yes	Yes
Adj R2	25.5%	25.5%	26.1%

Table 6

Portfolio Concentration and Investor Information Ratios

Table 6 reports intercept coefficients and robust t-statistics in parentheses for regressions of *Information ratio* on *Mean Concentration* and controls for all unique non-financial institutional investors on the OSE in the period 1993 to 2006. All variables are defined in Table 3. Statistical significance at the 10%, 5%, and 1% level are indicated by *, **, and ***, respectively. Investors with less than six months of trading history are dropped from the analysis. *Information ratio* is winsorized at the 1% level.

	1
Mean Concentration	0.467***
	(15.2)
Mean Portfolio	-0.006***
	-(8.3)
Mean N. Companies	0.007***
	(11.0)
Public	0.043***
	(2.7)
Constant	-0.581***
	-(19.1)
N	20,620
Adj R2	1.8%

Table Appendix A1

Investor Portfolio Concentration

Table Appendix A1 gives an example of how portfolio concentration is measured for one investor in one calendar month. *Concentration* is measured for each investor on the OSE for all calendar months in the sample. Column 1 lists the companies trading on the exchange. Column 2 lists the company weights in the example market value weighted portfolio. Column 3 lists the company weights in the example investor portfolio. Column 4 lists the absolute difference between the investor weights and the market weights in each company. *Concentration* is calculated as half of the cumulated absolute difference between investor weights and market value weights; see Choi et al. (2017).

1	2	3	4 (2 -3)
Company	Company weight in market portfolio	Company weight in investor portfolio	Absolute difference
1	0.200	0.000	0.200
2	0.200	0.000	0.200
3	0.200	0.000	0.200
4	0.350	0.000	0.350
5	0.050	1.000	0.950
Total	1.000	1.000	1.900
Concentration			0.950