

Open Market Share Repurchases in Norway:

Short- and long term performance of repurchasing firms

Outline of presentation

- About share repurchases? Different repurchase methods
- Why do firms repurchase shares?
 - theory
 - empirical findings in other countries
- Why interesting to study repurchases? Why Norway?
- Empirical evidence on repurchases in Norway
 - the price effect of announcements of repurchase programs
 - long term performance of repurchasing firms
 - price effect of actual repurchase executions

What is a repurchase?

- **Open market repurchase (focus of this paper)**
 - firm buys a fraction of its outstanding shares directly in the market
 - transaction is not known to the market until after the trade
 - most common, 90% of repurchases in US 1985-1993, >95% in Norway
- **Tender offer repurchase/fixed price repurchase**
 - company states a purchase price and a desired number of shares, usually at a premium to the market price, with a time limit for tendering (a few weeks to a month)
- **Dutch auction repurchase**
 - firm set a range of prices at which it is willing to repurchase
 - each shareholder informs about his supply at different levels
 - firm chooses lowest price that will fill their demand

Repurchases in Norway

- Norwegian firms were allowed to repurchase shares from January 1999
- a repurchase program needs an approval from the shareholders (supermajority vote)
 - Max. allowed to repurchase 10% of outstanding shares
 - Max. repurchase period is 18 months
 - Not allowed to be financed by debt
- an option for managers to execute repurchases, no obligation
- requirement to announce repurchase transactions to the Oslo Stock Exchange within next trading day
 - important difference from the US, Canada
 - US firms generally do not announce repurchases, must be inferred from financial statements, or changes in outstanding shares etc.
 - SEC Rule 10b-18 provide guidelines, but no mandatory requirement

Repurchases vs. cash dividends

- similar to a cash dividend in that it is a way to return cash to shareholders
- what makes repurchases different from regular cash dividends?
 - non proportional cash distribution - only tendering owners receive cash
 - changes the ownership- and capital structure of the firm
 - number of outstanding shares reduced (temporary or permanent reduction)
- in a “perfect world” [Modigliani/Miller, 1961] the choice of cash distribution method does not affect shareholder wealth
 - taxes, asymmetric information, incomplete contracting, insitutional constraints, clientele and transaction costs may alter this result

The announcement effect

- firms experience an abnormal price impact when announcing a new program (the announcement effect)
 - in the US and Canada repurchasing firms experience an abnormal return of about 3% [e.g. Ikenberry et.al. 1995, 2000]
 - in Norway the announcement effect is about 2.5%
- ⇒ the initiation of a repurchase program seem to have economical benefits to shareholders
- why do we observe this announcement effect?

The announcement effect

■ signaling/undervaluation

- management believes that the firm is priced below the full information value
- credibility issues ->
 - firms are not required to repurchase any shares
 - no cost of signaling falsely
 - more credible if managers have a stake in the firm

■ taxes

- personal shareholders in the US generally get a tax benefit from **not** being paid dividends
- weak empirical support - the price increase is generally too large to be explained by a tax premium - also similar effect across different tax regimes
- the largest owners (institutions and other corporations) are indifferent (Brav et al., 2003)

■ free cash flow (mitigation of agency costs)

- cash may be misallocated by management to maximize personal benefits
- a repurchase reduces the agency costs of free cash, increasing the value of the firm [Jensen 1986]
- reluctance to increase dividends when not sustainable (costly to change div)

The announcement effect

Additional explanations for why firms repurchase:

- **to counter dilution effects**
 - management and employee options
 - repurchase shares and redistribute instead of issuing new shares
- **artificially boost EPS numbers when managers know earnings are low**
- **maximize value of management options (by substituting dividends)**
 - option values negatively related to amount of cash dividends
- **takeover defense**
 - a restructuring process may replace management
 - sell shares back to “white knights” supporting the management
 - increases the takeover price by removing the shareholders with lowest valuations
 - mainly targeted (“greenmail”) or tender offer repurchases

An increasing trend in repurchases

- a general trend towards more repurchases relative to dividends (Grullon/Michaely 2002) - “substitution hypothesis”
 - in 2002 US firms distributed as much cash through cash dividends as repurchases
 - one reason for this may be the growth in use of stock option plans for managers and employees
 - account for the decreasing trend in dividend payments (Fama/French 2001)
 - However, total payouts have decreased

- What do we observe in Norway?

Repurchases in Norway

■ Announcements of repurchase programs in Norway 1998-2001

Period	Announcements	Different firms (i)	Max ann.	Authorized repurchase amount		
				Min.	Mean	Max.
Whole sample	318	163	4	1.0%	9.5%	10.0%
1998	28	28	1	2.5%	9.1%	10.0%
1999	85	85	1	1.0%	9.5%	10.0%
2000	93	90	2	1.0%	9.4%	10.0%
2001	112	109	2	3.3%	9.6%	10.0%

■ Why is Norway interesting?

- very “clean” data on actual repurchases due to the strict announcement requirements (OSE) for
- the tax argument for announcement effect (the US “puzzle”) is reversed (tax benefit of dividends relative to capital gains)

Repurchases in Norway?

■ Completion rates of announced programs

- Of the 163 firms that announced a repurchase program 100 repurchased while 63 did not execute any repurchases

Period	Repurchasing firms		Completion rates			Days until first repurchase			
	Repo	Norepo	Median	Mean	Max	Min	Median	Mean	Max
Whole sample	100	63	1.8%	2.9%	22.1%	1	169	198	502
1998	15	13	1.9%	2.9%	10.0%	20	364	326	469
1999	41	44	1.9%	3.2%	19.0%	9	203	216	502
2000	65	25	1.8%	2.9%	16.1%	2	217	206	498
2001	60	49	1.3%	2.7%	22.1%	1	123	138	459

Repurchases in Norway?

■ Volume of actual market repurchases

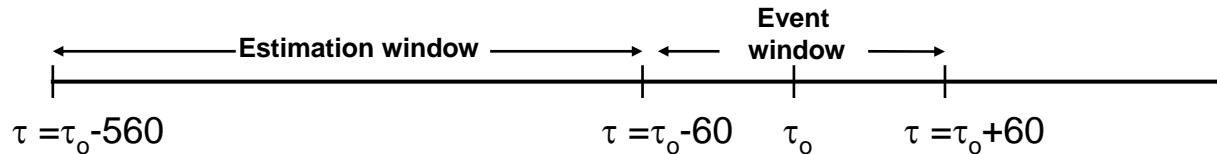
- the repurchase volume (NOK) doubled from 1999 to 2001, drop in repurchases in 2002
- Fraction of repurchases to dividends: 25%, 44%, 43%, 8%
- Aggregate dividends was NOK 14.4, 12.1, 13.8, 19.4 bill.

Panel A: Cross sectional repurchase statistics

	Firms	Number of repurchases					Repurchase size		Repurchase volume	
		N	min	median	mean	max	shares (1000)	NOK (1000)	Mill. shares	Mill. NOK
Whole sample ^a	100	1719	1	10	16.7	197	159	7223	247	16505
1999	41	205	1	3	5.0	17	168	13259	35	3679
2000	60	463	1	5	7.7	64	186	12770	65	5320
2001	69	659	1	4	9.6	120	281	7480	107	5947
2002 ^a	39	392	1	5	10.1	50	122	3780	41	1560

Short-term market reaction to announcements

- the market reaction of the announcements, apply a traditional event study methodology (τ =event time, τ_0 =announcement date)



- expected returns are defined by a statistical model (regular market model, Fama/French and Carhart specifications)

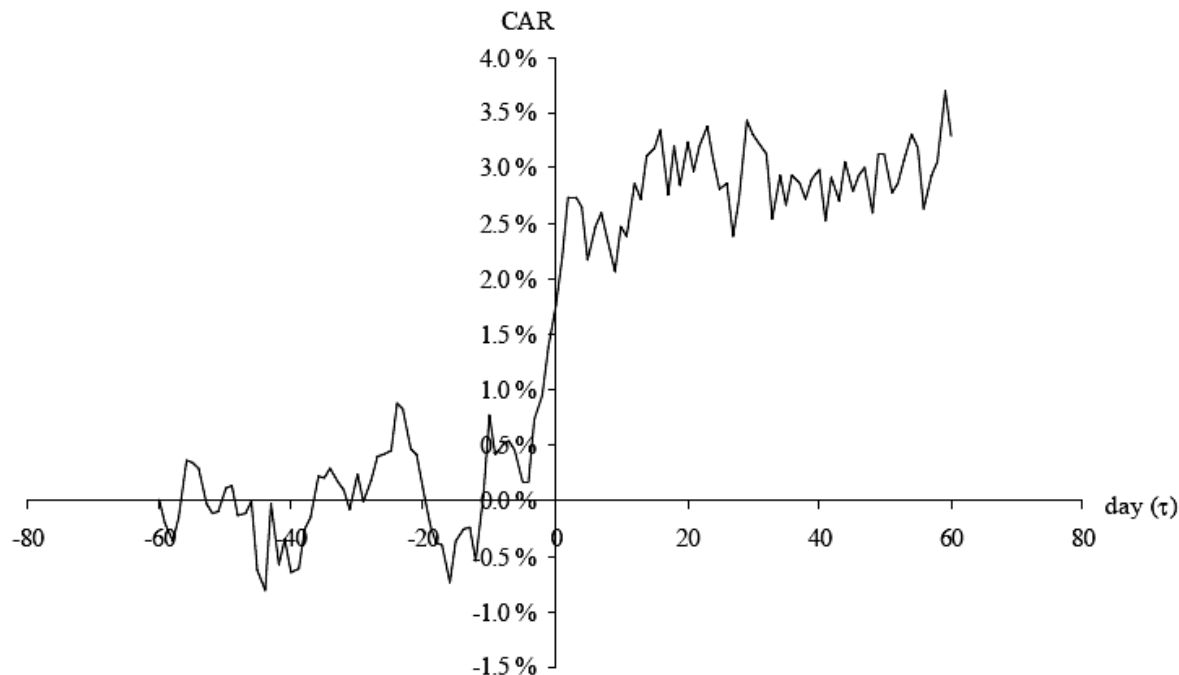
$$E[r_{i,\tau}] = \alpha_i + \beta_i^m r_\tau^m + \beta_i^{hml} r_\tau^{hml} + \beta_i^{smb} r_\tau^{smb} + \beta_i^{mom} r_\tau^{mom} + \varepsilon_{i,\tau}$$

- estimated during estimation window, parameter estimates kept fixed during event window
- calculate average abnormal return (AAR_τ) across all firms (N) on each event date (τ),

$$AAR_\tau = \frac{1}{N_\tau} \sum_{N_\tau} \{ r_{i,\tau} - E[r_{i,\tau}] \}$$

Short-term market reaction to repurchases

- Cumulating the average abnormal returns over the event period show that the market react favorably to the announcement
- No indication of timing with respect to underperformance in the period prior to the repurchase (Stephens/Weisbach 1998)



Short-term market reaction to repurchases

■ The announcement effect in Norway

		Days relative to announcement date τ_1 to τ_2					
	n	-60 to -3		-2 to +2		+3 to +60	
Whole sample (1998-2001)							
Unadjusted market model	318	-0.23	(-0.29)	2.52	(3.72)	0.51	(0.62)
Dimson (1979)	318	-0.06	(-0.07)	2.43	(3.53)	0.24	(0.29)
Scholes and Williams (1977)	318	-0.25	(-0.32)	2.44	(3.58)	0.20	(0.24)
Fama and French (1993)	318	-0.31	(-0.41)	2.52	(3.72)	0.63	(0.77)
Carhart (1997)	318	-0.25	(-0.34)	2.62	(3.86)	0.62	(0.75)
Subsamples (year)							
1998	28	1.59	(0.85)	1.25	(0.57)	1.47	(0.89)
1999	85	-0.68	(-0.56)	2.79	(2.66)	2.35	(1.53)
2000	93	-1.97	(-1.63)	1.36	(1.30)	0.42	(0.25)
2001	112	1.03	(0.66)	3.86	(2.72)	-0.80	(-0.56)
Announced repurchase limit (%)							
<0%- 5%]	42	-2.93	(-1.85)	3.37	(1.30)	-0.81	(-0.46)
<5%-10%]	276	0.16	(0.19)	2.50	(3.70)	0.84	(0.92)

Short-term market reaction to repurchases

■ Decomposing the announcement effect

$$\widehat{CAR}_i(\tau_1, \tau_2) = \alpha + \beta_1 \widehat{CAR}_{i, \tau_1 - k} + \beta_2 \overline{SPR}_{i, \tau_1 - k} + \beta_3 MCAP_{i, \tau_1 - 1} + \beta_4 BM_{i, \tau_1 - 1} + \beta_5 PERC_{i, \tau} + \beta_6 DIV_{i, \tau_1 - 360} + \beta_7 QuickRatio_{i, \tau} + \epsilon_i$$

Variable	Model 1				Model 2			
	Est.	std.err.	p-val.	Part.R ²	Est.	std.err.	p-val.	Part.R ²
Constant	0.041	0.034	0.228	-	0.026	0.036	0.463	-
$\widehat{CAR}_{\tau_1 - k}$	-0.165	0.046	<0.001	0.027	-0.151	0.049	0.002	0.027
$\overline{SPR}_{\tau_1 - k}$	0.338	0.067	<0.001	0.060	-	-	-	-
$MCAP_{\tau_1 - 1}$	-0.013	0.005	0.008	0.016	-	-	-	-
$BM_{\tau_1 - 1}$	0.023	0.006	<0.001	0.051	0.028	0.006	<0.001	0.051
$PERC_i$	-0.179	0.350	0.609	0.000	0.054	0.364	0.882	0.000
$DIV_{i, \tau_1 - 360}$	-0.031	0.017	0.067	0.008	-0.035	0.018	0.045	0.012
Quick ratio _{τ}	-0.007	0.002	0.002	0.026	-	-	-	-
adj.R ²	0.171				0.078			
N	318				318			

The underreaction “puzzle”

- **Long term abnormal performance:**
 - in an efficient market the initial reaction to the announcement should be unbiased and immediate
 - however, US and Canadian firms systematically outperform the market by >10% a year after the announcement
 - the initial reaction is too low
 - the market slowly incorporates the information contained in the signal
- **line up with evidence for other announcements that a priori should contain important information with respect to pricing (e.g. earnings surprises, dividend initiations)**
- **Mis-pricing or mis-specification?**
 - Fama -> sample specific, expected by chance, need more evidence from other countries and time periods
 - Schleifer -> behavioural biases, investors react slowly to signals (conservatism)

Long term performance

- create a portfolio of firms that have announced a program (calendar time)
- rebalanced every month, adding to the portfolio all firms that announced a repurchase program during the previous month
- at any point in time the return on the equally weighted portfolio is,

$$r_{p,t} = w_{i,t} r_{i,t} \quad \text{where} \quad \sum_{i,t} w_{i,t} = 1$$

- the abnormal performance of the portfolio (α_p) is estimated relative to three model specifications (CAPM, Fama/French, Carhart):

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_p^M (r_{M,t} - r_{f,t}) + \varepsilon_t$$

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_p^M (r_{M,t} - r_{f,t}) + \beta_p^{HML} HML_t + \beta_p^{SMB} SMB_t + \varepsilon_t$$

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_p^M (r_{M,t} - r_{f,t}) + \beta_p^{HML} HML_t + \beta_p^{SMB} SMB_t + \beta_p^{SMB} MOM_t \varepsilon_t$$

Long term performance

■ Long term performance estimates

Panel A: Buy-hold portfolio performance (no limit on holding period)

	CAPM		Fama/ French		Carhart	
		t-value		t-value		t-value
→ α (%)	0.10	4.71	0.04	2.29	0.04	2.30
β_m	0.58	33.79	0.72	38.88	0.72	37.94
β_{smb}	-	-	0.27	13.51	0.27	13.38
β_{hml}	-	-	0.06	3.74	0.05	2.90
β_{mom}	-	-	-	-	-0.02	-0.98
adj. R^2	0.523		0.602		0.602	
N	1041		1041		1041	

Panel B: Various holding periods

Holding period	CAPM		Fama/French		Carhart	
	α (%)	t-value	α (%)	t-value	α (%)	t-value
1 year	0.064	2.18	0.008	0.28	0.008	0.27
2 years	0.087	4.49	0.036	1.98	0.036	1.99
3 years	0.100	4.61	0.046	2.28	0.047	2.29
4 years	0.099	4.73	0.045	2.31	0.045	2.32
Whole sample	0.098	4.71	0.044	2.29	0.045	2.30

Long term performance

- Long term performance estimates - varying starting year

Year when starting portfolio construction

Holding period	1999		2000		2001	
	$\alpha(\%)$	t-value	$\alpha(\%)$	t-value	$\alpha(\%)$	t-value
1 year	0.009	0.31	0.008	0.23	0.02	0.46
2 years	0.038	2.11	0.044	2.09	0.07	2.59
3 years	0.049	2.40	0.059	2.38	-	-
4 years	0.048	2.44	-	-	-	-

- Overall, the Norwegian market seem to underreact to the announcements
- Relative to a Fama/French and Carhart specification, the portfolio of announcing firms experience an abnormal performance of 11% per year

Performance conditional on actual repurchases

- Long term performance conditional on repurchase activity
- Create two portfolios:
 - P1 -> include firms first day of month after they announce the plan
 - P2 -> include firms first day of month after they execute first repurchase (remove firm from P1)

	CAPM		Fama/French		Carhart	
	P1 (norep)	P2 (rep)	P1 (norep)	P2 (rep)	P1 (norep)	P2 (rep)
α (%)	0.10	0.10	0.06	0.03	0.06	0.03
p-value	0.00	0.00	0.03	0.20	0.03	0.20
β_m	0.58	0.56	0.68	0.72	0.67	0.73
β_{smb}			0.20	0.31	0.20	0.32
β_{hml}			0.05	0.04	0.01	0.06
β_{mom}					-0.08	0.03
adj. R^2	0.39	0.37	0.42	0.45	0.43	0.45
Avg. firms	45	69	45	69	45	69

Performance conditional on actual repurchases

- Varying starting year and holding period

Max. holding period	Year when starting portfolio construction					
	1999		2000		2001	
	$\alpha(P1)$	$\alpha(P2)$	$\alpha(P1)$	$\alpha(P2)$	$\alpha(P1)$	$\alpha(P2)$
1 year	0.045 (0.191)	0.013 (0.727)	0.069 (0.128)	-0.007 (0.86)	0.134 (0.039)	0.028 (0.655)
2 years	0.066 (0.046)	0.012 (0.658)	0.089 (0.033)	-0.006 (0.832)	0.121 (0.034)	0.017 (0.665)
3 years	0.063 (0.036)	0.028 (0.231)	0.083 (0.027)	0.016 (0.533)	.	.
4 years	0.061 (0.025)	0.029 (0.308)

Performance conditional on actual repurchases

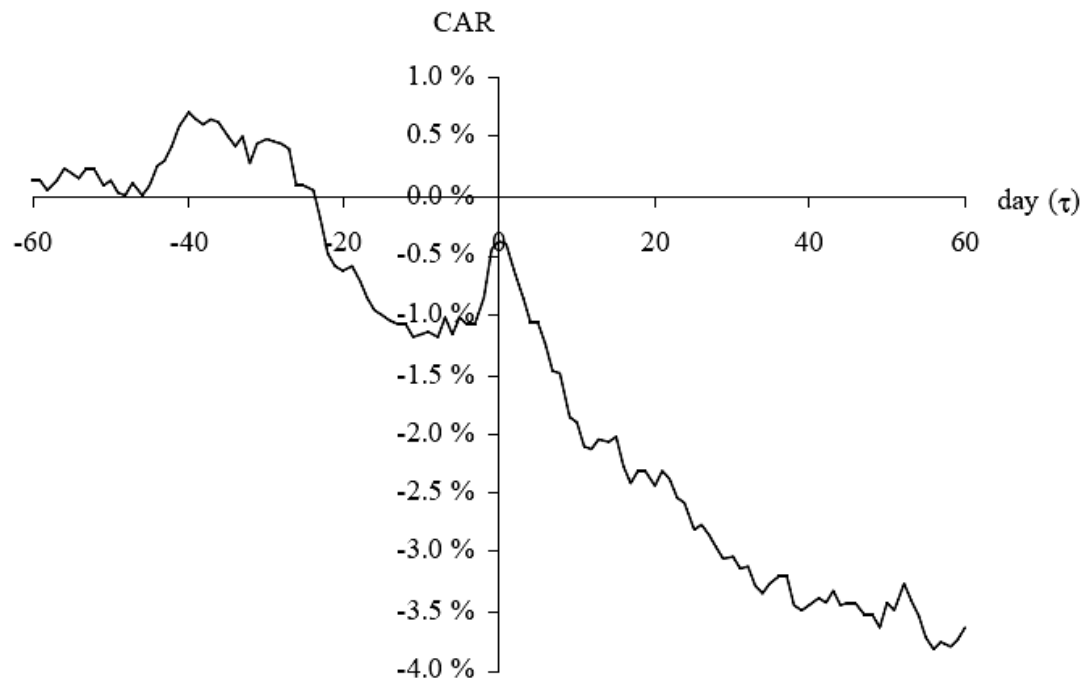
- **Why do firms that execute repurchases perform as expected?**
 - poor performance trigger repurchases
 - the actual repurchases mitigate undervaluation (stronger/confirming signal)
 - moving the price closer to full information value, reducing subsequent returns

- **Why do "non-repurchasers" outperform?**
 - undervaluation corrected quickly after the announcement
 - constrained from executing repurchases due to low liquidity
 - unable to exploit/signal undervaluation -> information surpluses in later periods generate excess returns

	All OSE firms			No repurchase (1)			Repurchase (2)			Test for difference in means	
	Mean	Mean	Std.err	N	Mean	Std.err	N	(2) <= (1) p-value	(1) = (2) p-value		
	Quick ratio										
All years	2.32	1.66	0.14	63	2.47	0.24	100	<0.01	<0.01		

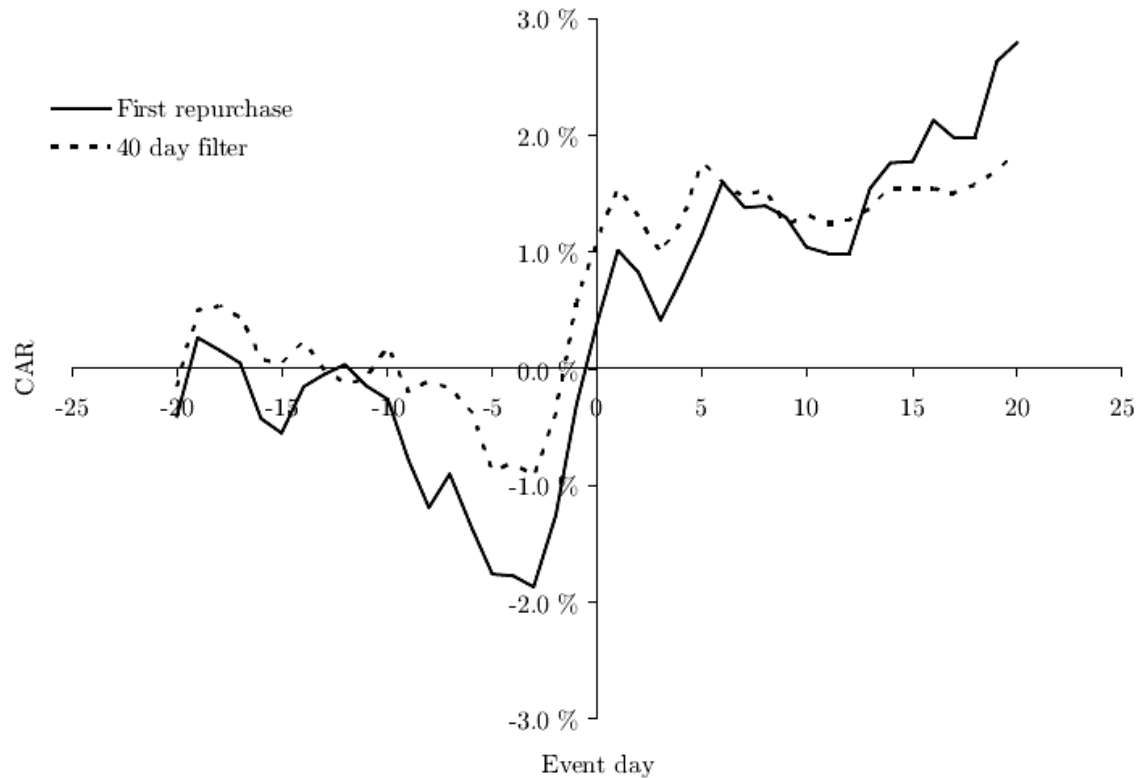
Effect from actual repurchase executions

- 1375 repurchases related to repurchase plans in 1999-2001
- Severe clustering problems - however, give some info into general trend in cumulative excess returns



Effect from actual repurchase executions

- Examining only first repurchase, and 40 day filter



Effect from actual repurchase executions

- Effect of subsequent repurchases

Repurchase number	Firms	%CAR (τ_1, τ_2)	std.dev	t-value	avg.fraction	
					of rep.vol	of outs. shares
1	100	0.877	0.023	3.83	38.1%	1.1%
2	81	0.388	0.021	1.69	16.1%	0.6%
3	66	0.398	0.018	1.77	13.1%	0.7%
4	65	0.045	0.017	0.22	11.6%	0.5%
5	54	0.012	0.015	0.06	8.7%	0.6%
6	51	0.449	0.021	1.55	8.0%	0.6%
7	41	0.298	0.019	1.00	6.6%	0.6%
8	38	0.599	0.020	1.84	6.9%	0.7%
9	33	0.218	0.018	0.68	3.1%	0.2%
10	26	-0.051	0.017	-0.16	3.9%	0.3%



Summary of results

- Norwegian firms show the same patterns as in the US/Canada
 - the announcement effect is about 2.5%
 - underreaction: long term average abnormal return of >10% per year

- Exploiting the unique feature of the data we find that
 - a portfolio of firms actually executing repurchases perform as expected, while non repurchasers outperform
 - announcing firms that do not repurchase may be constrained due to low liquidity

- The actual repurchases seem to convey important information to the market
- The first repurchase execution is the most important

What is the effect of a repurchase?

- A simplified example of equivalence of payout policy:

Balance before cash distribution:

Cash	150			NOSH=1000
Other assets	850	1000	Value of equity	Share price=1
<u>Firm value</u>	<u>1000</u>	<u>1000</u>	<u>Firm value</u>	

Balance after dividend payment of 100 (0.1 per share)

Cash	50			NOSH=1000
Other assets	850	900	Value of equity	Share price=0.9
<u>Firm value</u>	<u>900</u>	<u>900</u>	<u>Firm value</u>	

Shareholder owning 10 shares:

Value of dividends:	1
Value of shares:	9
<u>Total wealth:</u>	<u>10</u>

Balance after repurchase of 100 (=100 shares at price 1):

Cash	50	-100	Treasury stock	NOSH=900
Other assets	850	1000	Value of equity	Share price=1
<u>Firm value</u>	<u>900</u>	<u>900</u>	<u>Firm value</u>	

Wealth of tendering shareholder:

Value of dividends:	0
Value of shares:	10
<u>Total wealth:</u>	<u>10</u>

- The value of the shares of the non-tendering shareholders remains the same (price still=1)
- Thus, shareholders should be indifferent w.r.t. payout policy since their wealth is unaffected

Why **don't** firms repurchase more?

- Why don't firms repurchase more?
 - capital gains are has a tax preference to income tax
 - **credibility**: dividends are considered a more **binding commitment** than repurchases
 - **negative signal**: no profitable investment opportunities (reluctant to increase dividends if excess cash holding is non sustainable)
 - **increased cost of capital**: spread increases after the announcement of a repurchase plan (higher probability of trading with an informed investor - the firm)
 - clientele (institutional constraints, "prudent" investors)

- However, a trend towards more repurchases relative to dividends (Grullon/Michaely 2002) - "substitution hypothesis"
 - in 2002 US firms distributed as much cash through cash dividends as repurchases