Management
of Share Repurchases

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1. Introduction

Corporate share repurchase activity increased significantly over the last 20 years and became gradually an important way to return cash to the shareholders. Many companies paying no or little dividends are involved in large share buyback programmes.

Repurchase transactions may come into management's consideration for different reasons. First, the operating cash flow may exceed significantly corporate investment needs. If a company generates excess cash it may consider returning some of it to the shareholders or investing it and creating cash cushion against potential business downturns. There exist several well-known methods of returning cash to the shareholders, such as share buybacks, regular and special dividends and a lot of research has been devoted to the study of reasons motivating these operations (see Grabowski, 2002, and references there). Second, the issue of new shares may cause substantial dilution that has to be countered. Except standard seasoned offerings companies issue shares mainly in connection with the employee stock option plans and acquisitions. Managing the option plan must involve calculating the benefits/savings of cash against future exercise and dilution and potential repurchase cost.

While many studies investigate the relative advantage of various cash-returning strategies, less attention has been paid to the question of the optimal design of such activity and its practical implementation. Perhaps to a degree much larger than paying dividends the execution of share buybacks involves the interaction of the management decisions with the behavior of speculative investors. As a consequence the impact of market volatility on management decisions increases.

The execution of repurchase programmes may be thought as an important part of the corporate financial strategy and deserves more attention. It is clearly more profitable to buy back shares at the lowest possible price. How to time the repurchase operations? What should be their scale? Should

a company buy back shares more or less all the time or should it try to time the repurchase transactions over the business cycle or the stock market highs and lows? What is the impact of high volatility on the efficiency of repurchase transactions? To what extent the repurchase activity is influenced by the management's expectations of the stock market dynamics? Should derivative enhancements be used?

In this paper I examine the recent repurchase activity of Microsoft and Intel. Both companies issued almost 15% of new shares in 1998–2002. These issues were driven largely by employee stock option plans. There were some exceptions, like the 1998 Intel issues to cover the call warrant exercises or the acquisitions of Microsoft in 2001, which accounted for about one-third of the new issues that year. Microsoft's stock options grants were volatile and ranged annually from less than 1% to over 5% of the shares outstanding in 1998–2002. Intel's grants were at the level of 4% of shares outstanding per annum, a fairly high level.

Below I perform a brief scenario analysis of the Microsoft and Intel repurchase operations in 1998–2002, and try to find the cash investment strategy that would result in the same EPS over the period. I also look at an example of an alternative repurchase strategy and compare its effects with the one, which was actually carried out.

2. Scenario analysis

The share prices of both Microsoft and Intel are highly volatile, and it is common for the year maximum price to be roughly 100% higher than the year minimum price. Clearly, it is difficult to perfectly time the market and buy back shares at the low. Further, the repurchase transactions must be spread over time for market liquidity reasons. I assume that buying at a 20% premium to the year low is a fairly good repurchase execution. Consequently, the scenario A is a repurchase scenario set up in the following way. The amount of cash actually used for repurchases in year x, starting in 1998, is used to repurchase shares at the price 20% higher than the lowest share price for that year. I adjust the number of the shares outstanding at the end of each year by the cumulative difference resulting from following the scenario A in the five years 1998–2002, and compare the EPS figures obtained by dividing the net income by the actual number of shares outstanding at the end of the year and by the number of shares outstanding at the same date in scenario A. It must be noted that EPS obtained in this way is different from the EPS reported in the income statement where the average number of shares is used for the EPS calculation. Since to obtain the average number of shares the timing of all share issues and retirements must be known the year-end figure is used instead. If the ratio of Scenario A EPS to the actual year-end EPS is close to 1, we may conclude that the effect of the actual repurchase transactions does not differ meaningfully from the Scenario A buyback execution.

The scenarios B/x assume no repurchase transactions. Instead, the cash amounts actually used for repurchases increase the cash&sti (cash and short-term investments) account. I start with the amount of the 1997 repurchases and assume that it is invested in 1998 at $x\%$ interest. This interest income adjusted for the tax provision at the same rate as other income each year is added to the actual net income, and the interest amount net of tax provision plus the amount actually used for repurchases in the years 1997 and 1998 is invested at the same interest rate in 1998 to obtain interest income. This is again taxed, added to the actual 1998 net income, and the amounts in the other years are constructed in the same way until 2002. This scenario is equivalent to the set up of an interest-bearing account where the amounts actually spent on repurchases and the interest net of tax are placed. Since there are no repurchases, the actual year-end number of shares is augmented by the number of shares actually repurchased to obtain the year-end number of shares under the no repurchase scenario. The net income in such scenario, which includes the added interest income less tax, is divided by the no-repurchase number of shares to obtain the EPS in the Scenario B/x. If the EPS figure in the B/x scenario is the same as the actual EPS we may conclude that the actual buyback was equivalent to the cash investments at $x\%$, i.e. that the return on the repurchase transactions was $x\%$ for the specified period.

3. Results

A. Microsoft

Microsoft increased its repurchase operations significantly in recent years. The share of buybacks in the operating cash flow was in the range of 40% or about $6bn annually. The cash and short-term investment position increased rapidly from $14bn in 1998 to over $38bn in 2002. The interest income was equal to over 10%, and most recently to 15% of operating income. Microsoft repurchased 394m and issued 937m shares in 1998–2002, so the buybacks were less than 50% of the issues and around 8% of the outstanding shares (Table 1).

The results of following the Scenario A for Microsoft (Table 3) are roughly similar to the actual buyback performance despite the fact that the actual average repurchase price obtained by dividing the actual repurchase cash consideration by the number of the repurchased shares was frequently higher than the Scenario A price. This resulted in a cumulative difference of 25m shares in 2002, which corresponds to 20% of the shares bought back in that year. Such difference in the number of repurchased shares seems insignificant compared to the number of shares outstanding at the end of 2002 of over 5.3bn and as a consequence the difference in the EPS figures appears negligible. Although the cumulative difference is not so large the cash differences are of the order of one billion dollars each year, and could have been saved if the transactions were executed as in Scenario A. Indeed, the cumula-

tive difference is not so large due to the efficient buyback transactions in 2002.

Following the no-repurchase scenario with the interest rate of 4.5% (B/4.5) would result in the EPS figures almost matching the actually realized EPS. This means that the repurchase activity in the 1998–2002 period effectively was no better than investing the cash at 4.5% and reinvesting the interest. If cash were invested at 7% (B/7) there would be an EPS improvement of about 1% in 1998–2000, the EPS would increase by 3.9% in 2001 and by 4.7% in 2002. The improvements due to the strategy become pronounced only after 2000, since the earlier net income figures included large recognized gains on investments during the Internet boom, and large recognized losses on investments in 2001 and 2002. The no-repurchase strategy with 9% return would result in the 2% EPS improvements in 1998–2000 period and 6.6 and 8.4% enhancements in 2001 and 2002. The investments at such level of return would be somewhat more risky increasing the probability of some losses as well. In reality, the rough measure of return on c&sti for Microsoft obtained by dividing the annual interest income by the c&sti amount was between 4.5% and 6% in recent years. Following the B strategies would increase total assets and c/sti position by 20.5 billion dollars to $88bn and $59bn. The share of c&sti in total assets would increase from the actual 57% to 67% by the end of 2002.

B. Intel

The operating cash flow of Intel was at the level of $9bn in 1998 and 2001–2002, and over $12bn in 1999–2000. The company repurchased about $4bn of its shares annually during that period, with the exception of 1998 when buybacks reached almost $6.8bn or 73% of the operating cash flow. Since 1999 the total assets were little changed at about $44bn and the c&sti position was at around 25% of the total assets. The interest income was in the range of 2.7–8.8% of the operating income. The company repurchased almost the same number of shares that it issued, 857m against 919m, or about 15% of the total outstanding shares, in 1998–2002, so the repurchase programme countered the dilution (Table 2).

The average repurchase price in Intel's buybacks was higher each year than the year minimum plus 20% premium. Following the scenario A since 1998 would therefore increase Intel's EPS by 0.5% in 1999, 1% in 2000, 1.6% in 2001 and 2.7% in 2002. Buying at 20% premium to the year lows each year would result in 175m shares repurchased more, or over 20% more than the actual buyback result (Table 4).

The implementation of the B scenarios would bring about a different effect. The strategies would slightly underperform the actual buyback strategy in the 1998–2000 period and significantly outperform it in 2001–2002. This is due to the large drop in operating income during the retreat of the technology market in the most recent period. The B/7 strategy, or the cash investments at 7% would almost match the actual buyback strategy in 1998–2000 and outper-

form it by 50% and 25% in 2001 and 2002. The B strategies with cash invested at lower interest rates would result in the outperformance of the actual strategy in 1998–2000 and the outperformance of the B strategies in 2001–2. We may conclude that the return on repurchases was slightly more than 7% in the 1998–2000 period. If the strategy B/5 were followed, Intel's c&sti position and total assets would increase to $33.8bn and $67.2bn in 2002 so the c&sti would constitute half of the company's assets.

4. Equity derivative transactions

In addition to straightforward share repurchases and issues both companies carried out some derivative operations with their own equity as the underlying instrument, selling puts, calls and entering into structured forward transactions.

In 1991–1999 Intel was issuing put warrants on its own stock and collected the cumulative net premium of $683m. In 1998 30m warrants were exercised at about 40$ per share. In 1993 Intel issued 160m Step-Up Warrants, a long--term call option on its stock, with the exercise price increasing with time and the expiry date of March 14, 1998. As the maximum strike price was $10.4375, the warrants, which initially provided Intel with $287m premium caused the issue of 155m shares for $1.6bn in 1998 to cover the securities exercised against Intel. The management decided to counter some part of the resulting 5% dilution with repurchases in the same year. This repurchase operation (including put warrant exercises) created the cash outflow of almost $7bn.

Microsoft issued put warrants to enhance its repurchase plan as well. In 1998–2000 it collected close to $1.8bn of net premium and in 2001 settled the outstanding warrants with about $1.4bn in cash and with 2.8m of shares issued. It seems that shares were issued when their price was high enough (in 3Q2001) to make the share issue more reasonable than cash settlement. In 1998 Microsoft entered into two structured forward transactions to repurchase 42m shares of its stock and paid some cash. In 1999 the company settled the agreements by returning 28m shares. In 2001 it entered into new structured repurchase agreement to buy 5.1m of its shares and paid $264m.

5. Conclusion

In this note the equity capital management of Microsoft and Intel over the last five years was analyzed briefly. Each company spent over $20bn in cash in that period to repurchase its own shares. The repurchase activity limited the dilution almost completely in the case of Intel and in less than 50% in the case of Microsoft. For both Intel and Microsoft the dilution was driven mainly by the share issues related to the employee stock option plans. In this paper I formulated the problem of the optimal repurchase design and the optimal repurchase strategy. I analyzed several alternative cash management/repur-

chase strategies for both companies over the period. One of them involved buying back stock at a specific level relative to market lows, the other involved the investment of cash otherwise directed to repurchases. Clearly, the analysis of the first of these strategies involves the ex-post data. It could be taken further by the examination of more complex strategies, like the issue/repurchase strategy linked to the business cycle or some broader financial market indicators. The study demonstrates how important to the cash management is the stock option plan design and its implementation. Stock option plans seem to influence significantly the flexibility of financial management. A more precise measurement of this impact is yet another topic for further research.

References

Grabowski W., 2002, "Share issues and repurchases, stock option plans, and managerial timing", *Ekonomia* No 8, p. 207–217, Department of Economics, University of Warsaw.

Intel, *Annual Reports*, 1998–2002.

Microsoft, *Annual and Quarterly Reports*, 1998–2002.

Table 1.

Microsoft. Selected financial data 1998–2002

Year	1998	1999	2000	2001	2002
Shares outstanding, Beginning of the period (m)	4816	4940	5109	5283	5383
Shares outstanding, End of the period (m)	4940	5109	5283	5383	5359
Shares issued (m)	202	213	229	189	104
Shares repurchased (m)	78	44	55	89	128
Shares repurchased ($m)	2468	2950	4896	6074	6069
Net income ($m)	4490	7785	9421	7346	7829
Operating cash flow ($m)	8433	13 137	13 961	13 422	14 509
Repurchases/Operating cash flow	0,29	0,22	0,35	0,45	0,42
Cash&short-term investments, CSTI ($m)	13 927	17 236	23 798	31 600	38 652
Total assets, TA ($m)	22 357	37 156	52 150	59 257	67 646
CSTI/TA	0,62	0,46	0,46	0,53	0,57

Table 2.
Intel. Selected financial data 1998–2002

Year	1998	1999	2000	2001	2002
Shares outstanding, Beginning of the period (m)	6512	6631	6669	6721	6690
Shares outstanding, End of the period (m)	6630	6669	6721	6690	6575
Shares issued (m)	442	181	126	102	68
Shares repurchased (m)	324	143	74	133	183
Shares repurchased ($m)	6785	4612	4007	4008	4014
Net income ($m)	6068	7314	10 535	1291	3117
Operating cash flow ($m)	9191	12 134	12 827	8789	9129
Repurchases/Operating cash flow	0,74	0,38	0,31	0,46	0,44
Cash&short-term investments, CSTI ($m)	7310	11 400	13 473	10 326	10 786
Total assets, TA ($m)	31 471	43 849	47 945	44 395	44 224
CSTI/TA	0,23	0,26	0,28	0,23	0,24

Table 3.
Scenario analysis: effects of various strategies for Microsoft

Year	1998	1999	2000	2001	2002
EPSend (=Net income/Shares outstanding, End of period)	0,91	1,52	1,78	1,36	1,46
Scenario A:					
Cumulative difference in shares repurchased	–8	4	16	49	25
Scenario A EPS	0,91	1,52	1,79	1,38	1,47
Scenario A EPS/EPSend	1,00	1,00	1,00	1,01	1,00
Scenarios B/x:					
Scenario B/4.5 EPS	0,91	1,52	1,77	1,37	1,47
Scenario B/4.5 EPS/EPSend	1,00	1,00	0,99	1,01	1,00
Scenario B/5 EPS	0,91	1,52	1,78	1,38	1,48
Scenario B/5 EPS/EPSend	1,01	1,00	1,00	1,01	1,01
Scenario B/9 EPS	0,93	1,55	1,82	1,45	1,58
Scenario B/9 EPS/EPSend	1,02	1,02	1,02	1,07	1,08
Asset structure in Scenario B/5:					
Cash&short-term investments	17 028	22 903	32 600	45 589	59 183
Total assets	25 458	42 823	60 952	73 246	88 177
C&sti/total assets	0,67	0,53	0,53	0,62	0,67

Table 4.

Scenario analysis: effects of various strategies for Intel

Year	1998	1999	2000	2001	2002
EPSend (=Net income/Shares outstanding, End of period)	0,92	1,10	1,57	0,19	0,47
Scenario A:					
Cumulative difference in shares repurchased	19	28	65	105	175
Scenario A EPS	0,92	1,10	1,58	0,20	0,49
Scenario A EPS/EPSend	1,00	1,00	1,01	1,02	1,03
Scenarios B/x:					
Scenario B/7 EPS	0,90	1,09	1,55	0,29	0,59
Scenario B/7 EPS/EPSend	0,98	0,99	0,99	1,50	1,25
Scenario B/4.5 EPS	0,89	1,06	1,51	0,24	0,52
Scenario B/4.5 EPS/EPSend	0,97	0,97	0,96	1,25	1,10
Scenario B/5 EPS	0,89	1,07	1,52	0,25	0,53
Scenario B/5 EPS/EPSend	0,97	0,97	0,97	1,29	1,13
Asset structure in Scenario B/5:					
Cash&short-term investments	10 682	20 470	27 450	28 797	33 811
Total assets	34 843	52 919	61 922	62 866	67 249
Cash&sti/total assets	0,31	0,39	0,44	0,46	0,50