Share Issues and Repurchases, Stock Option Plans, and Managerial Timing

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The rapid rise of technology companies in the 1990s increased the widespread use of some financial management tools, like stock-related transactions. These processes are not well investigated and their explanation in terms of financial theories is not advanced. Similarly, our understanding of the optimal financial management of large modern companies is incomplete. The objective of this paper is to highlight some potential research extensions in areas such as determinants of stock issue and repurchase activity, stock option plan management, and interaction between corporate managers and speculative investors. First, I present briefly the stock-related operations of two major companies, Microsoft and Cisco.

1. Stock-related transactions: the case of Microsoft and Cisco

Cisco Systems is the dominant company in the networking and communications equipment business. Microsoft is the largest software company in the world. Both companies apply interesting stock-related financial management strategies. I review below some characteristics of their stock issue and repurchase operations, as well as their stock option plan design and implementation.

1.1. Microsoft

Options granted under Microsoft's stock option plans usually vest over four and a half years and expire over seven or ten years from the date of grant. At the end of 2002, 802 million options were outstanding against $5.4bn of basic shares. The company grants a varying number of options each year ranging from 41 million last year to 304 million in 2000 (see Table 1). At the end of the nineties the exercises were in the 180 million range annually. This sometimes exceeded the number of options granted. For example, 91 million options were exercised last year. The weighted-average exercise price of granted options was towards the middle of the market price range in most

years, and the exercise price ranges were similar to market price ranges. This indicates that the company awarded its options continuously.

Table 1.

Microsoft. Selected share, option, and cash flow data 1997–2002

Year	1997	1998	1999	2000	2001	2002
Cash flow data ($m):						
Stock option tax benefits	796	1553	3107	5535	2066	1596
Shares issued	744	959	1350	2245	1620	1497
Shares repurchased	3101	2468	2950	4896	6074	6069
Cash flow from operations	5485	8433	13 137	13 961	13 422	14 509
Options and shares (m):						
Options granted	220	138	78	304	224	41
Options exercised	180	176	175	198	123	99
Options canceled	36	25	30	40	35	38
Shares issued	188	202	213	229	189	104
Shares repurchased	148	78	44	55	89	128
Market price range ($)	13.44–33.74	29.50–54.28	47.25–95.63	60.38–119.94	41.5–82.00	48.62–72.57

Microsoft carried out substantial repurchases of its common stock every year. The amount of shares bought back annually in recent years did not exceed, and was frequently far below, the number of exercised options, except in the last year. Clearly, the management did not stop the dilution. Even so, the company directed large amounts of cash to these transactions, over $6bn annually in 2001–2002. In the first quarter of its fiscal 2003 the company bought back about $3.5bn of its common stock, over half of its operating cash flow for that period. Microsoft's cash from operations is consistently strong but the share of this flow used for repurchases exceeded 50% only once in the 1995–2002 period. Stock option tax benefits were quite large for the company, especially in 1999–2001. In 2000 they amounted to $5.5bn, or 40% of its operating cash flow, an exceptionally high figure. The average prices Microsoft paid in its repurchase transactions were usually in the middle of the annual market price range. Microsoft enhanced its repurchase plan with some forward transactions and put warrants. Microsoft carried out sizeable cash-settled investment transactions, buying securities of some telecommunications companies in the late 1990s. Some of them resulted later in substantial writedowns.

1.2. Cisco

Cisco has two major stock option plans established in 1987 and 1996, as well as a minor 1997 supplemental plan. In addition, the company assumed the plans of acquired companies. The 1996 plan is limited to 2.5bn shares with an automatic share reserve increase provision. Options become exerciseable for 20% or 25% of the shares one year from the grant date and then ratably over the next four or three years, respectively. The exercise prices are equal to the fair market value at the grant date. Options expire after maximum nine years. At the end of fiscal 2002 over 1.2bn options were outstanding, about half of them exerciseable, though largely out of-the-money, against 7.3bn basic shares outstanding.

In September 2001 the company adopted a stock repurchase plan to buy back up to $3bn worth of its common stock in the open market or negotiated transactions over two years. In August 2002 this limit was extended to $8bn.

Table 2.

Cisco. Selected share, option, and cash flow data 1996–2002

Year	1996	1997	1998	1999	2000	2001	2002
Cash flow data ($m):							
Stock option tax benefits	198	274	422	837	2495	1397	61
Shares issued	117	308	555	947	1564	1262	655
Shares repurchased	116	323					1854
Cash flow from operations	1063	1442	2881	4438	6141	6392	6587
Options and shares (m):							
Shares issued	172	214	280	300	219	140	76
Shares repurchased	27	44					124
Shares issued in M&A	937	90	48	98	452	46	27
Options granted	316	384	282	245	295	320	282
Options exercised	160	158	168	210	176	133	54
Options canceled	20	42	48	22	37	98	82

Over the last years Cisco was granting a relatively stable amount of around 300 million options annually (see Table 2). At the same time the number of shares issued in M&A transactions exceeded 1.8bn in the 1996–2000 period. The number of exercised options was less than those granted and remained in the 150–200 million range annually. The exercise prices of the granted options were usually towards the middle of the annual market price ranges of Cisco's stock. The stock option tax benefits were high in 2000 and 2001 reaching almost $2.5bn and $1.4bn, but were much lower in other years, under one billion dollars. They were negligible in 2002 due to the contraction in the market price of Cisco's stock. These stock option tax benefits were not a large

part of the cash flow from operations, except in 2000. In recent years Cisco's operating cash flow exceeded $6bn annually. Cisco did a modest amount of buybacks in 1995–7. There were no such transactions in 1998–2001. In 2002 the company bought back $1.85bn of its common stock at the average price of $14.95. Cisco's stock price range in that year was $11.24-$21.79. In the first quarter of its fiscal year 2003 Cisco bought back over $1bn of its shares. This figure was the same as its cash flow from operations for that period.

1.3. A comparison

Although both Microsoft and Cisco are major technology companies with global presence in their business areas their financial strategies differ. Both companies experienced fast growth during the late nineties. Annual sales growth was faster for Cisco, in the 30–80% range compared to Microsoft's 15–40%, but it proved also more sensitive to the subsequent downturn. Both firms have extremely strong operating cash flow. Both benefited from stock option plan tax credits. They had no material debt and paid no dividends. Microsoft kept very high cash and short-term investments positions, over 45% of total assets, and often over 60%, compared to Cisco's 13–28% range in 1995–2001. The stock market prices of both companies experienced multiple gains in the 1990s. The ownership of Cisco is dispersed, with largest institutional shareholders holding not more than around 3% of shares, and no large holdings of individual managers. In contrast, although institutional holdings are comparable to Cisco's, three individuals hold almost 20% of Microsoft's shares.

These features seem to have influenced some financial management choices differently. Microsoft's stock option grants were more volatile than Cisco's. In addition, Cisco used its high-priced stock as currency in most acquisitions. The issuance of stock for M&A transactions was comparable to the amount of stock option grants. In many of the investment transactions it originated Microsoft used cash. Cisco did not make any attempt to counter dilutive consequences of its policies until very recently, when its cash position increased from 19% of total assets in 2001 to 33% in 2002. Microsoft, in turn, regularly repurchased large amount of shares. Still, it did not eliminate stock option plan dilution. Cisco's buybacks started when its stock lost most of its peak market value. Microsoft repurchases increased with the decline of the market price but were executed in all recent years. The buyback prices were usually in the middle of the annual market price range for both companies. The buyback price range for Microsoft indicates that it bought shares back at almost all prices. Astonishingly, this indicates little concern for, or luck in, the timing of the transactions, at least based on the available data.

2. Some related recent research

Recent research efforts to provide both theoretical insight and empirical evidence on some of the mechanisms behind the stock-related corporate

transactions concentrate on determinants of payout policy, methods of payment in M&A processes, stock issue policies and option plan management.

Grullon and Michaely (2002) examine trends in the U.S. corporate payout behavior in recent decades. They provide statistics for the growth of the volume of repurchases and dividends. The amount of repurchases as the percentage of dividends changed from 8.44% in 1972 to 113.11% in 2000, their last sample year. There are two marked increase years in their data, 1984, when this share surges from the previous year's 15.42% to 46.54%, and 1997 and 1998, when it changes from 58.71% in 1996 to 81.03% and 95.72% respectively. In 1991 it falls to over 20% from over 40%. They use a large Compustat sample of companies. Various theoretical models offer arguments for and against substitution hypothesis, a claim that dividends and repurchases can be treated as substitutes. The authors demonstrate on their sample that they can indeed be understood as substitutes. They explain the surge in repurchase activity in the early 1980s by the introduction of the SEC Rule 10b–18 in 1982, which provided a regulatory framework for corporate open market repurchases and eased potential litigation concerns for companies. They provide some evidence that investors react less negatively to dividend reductions of firms with active repurchase programs than to those without one. This issue is treated in more detail in Nissim and Ziv (2001), who investigate the dividend information content hypothesis on a large sample of U.S. firms. They find that dividend increase signals higher future earnings after controlling for several variables including analysts' forecasts. The signal seems to be asymmetric in that dividend decreases are not negatively related to future profitability. Lie (2000) investigates stock price reaction to announcements of special dividends, tender-offer repurchases and dividend changes and finds positive evidence of excess funds hypothesis/agency problem reduction through disbursement of funds, on a sample of 1978–1994 payout events for U.S. firms. Abnormal returns in the announcement period are found for tender offers, and for special dividends. Sample firms had usually higher than average cash flow prior to special dividends and tenders. Grullon and Ikenberry (2000) discuss some operational and regulatory issues of repurchase programs, their completion rate, relation to stock liquidity, buyback techniques, their derivative enhancements as well as the SEC rule impact. They review main hypotheses put forward to explain stock repurchases: (1) The "EPS bump" story says that managers buy back stock to boost earnings per share. (2) A signaling hypothesis claims that managers distribute cash when they expect rising cash flows. This is similar to the dividend information content hypothesis. However, Grullon (2000) finds, based on a 1980–94 sample, that this may not always be the case. (3) Another signaling story says that companies react with repurchases to the undervalued stock price. Three studies, by Ikenberry et al. (1995, 2000) and by Chan et al.(2000) show some evidence for this in the U.S. 1980–90, Canada 1989–97, and the U.S. 1980–96 data samples. (4) An agency cost explanation states that as cash position increases

the managers are more likely to misallocate capital and increase agency costs. A buyback reduces such opportunities. Grullon (2000) finds that market reaction to buybacks is negative for firms with high operating return on investment.(5) Capital market allocation hypothesis says that buybacks are consistent with the efficient capital allocation. Companies return funds to investors when their return on marginal capital is less than investors'. Grullon (2000) finds that after repurchase program announcements firms decrease their capital expenditures. (6) Repurchase and dividends can be treated as substitutes as documented in Grullon and Michaely (2002) but repurchases are favored by some investors because of better tax treatment; (7) Capital structure adjustments may be linked, among other factors, to stock option exercises (some evidence for this in Chan et al.(2000). Bartov et al.(1998) test positively a sample of firms using 1986–1992 data for the evidence of three repurchase factors: market undervaluation, the extent of stock option programs and institutional investor shareholdings. Institutional investors prefer repurchases to dividends for tax reasons. This is similar to Grullon and Ikenberry explanations (3), (7) and (6) respectively.

Martin (1996) examines the determinants of stock-financed acquisitions on a 1978–88 sample of U.S. firms. He reviews some hypotheses of financing choice: (1) higher growth opportunities increase preference for equity financing in acquisitions, (2) in case of asymmetric information about target firm equity is preferred; as the target size increases equity is less likely, (3) large manager ownership may decrease stock financing, but there may be some nonlinearities, (4) firms with large amounts of cash prefer cash acquisitions, (5) large institutional shareholders may monitor management so that it does not finance M&A transactions with stock to avoid dilution, (6) cash payment may be simpler than stock-financing in the U.S. for regulatory reasons, (7) strong economic growth may increase stock-financings. He finds strong support for the hypothesis that high growing firms prefer to finance their acquisitions with stock, as do firms with lower cash balances and high institutional shareholdings. Ghosh and Ruland (1998) study how managerial ownership and preferences influence the method of payment in a U.S. 1981–1988 data sample and find that target firm managers with high ownership prefer to be paid in stock to retain control and job prospects. Chang (1998) examines returns in privately-held firm takeovers on a sample of 1981–1992 U.S. data. If bidders pay with stock this is similar to a private placement and induces positive market reaction in contrast to public target acquisitions, which are received negatively like public offerings. Bidders offering stock register positive abnormal returns, while those offering cash zero abnormal return. Returns are positively correlated with new blockholders and the amount of shares issued to target companies. New large shareholders are treated as more effective monitors, as well-informed investors from target company take large positions in the bidding firm. He reviews hypotheses on bidder returns: (1) limited competition hypothesis: takeover market is not perfect so

possibly the bidder pays less than fair price; (2) monitoring hypothesis: common stock exchange creates new blockholders; ownership concentration may decrease firm value by allowing managerial entrenchment and makes takeovers more costly; (3) information hypothesis: overvalued stock is issued in public and undervalued in private offerings, disclosure of information to a target group of investors allows them to become better informed; this is similar to the pecking-order theory of capital structure.

Baker and Wurgler (2002) propose the market timing explanation for capital structure:

capital structure evolves as the cumulative outcome of past attempts to time the equity market.

Managers try to time the market by issuing equity when its cost is low and by repurchasing when its cost is high. Managers do not reverse these actions when the cost of equity is not so extreme so that such transactions may have a longer-term impact on the capital structure. They find evidence for persistent effects of market-to-book fluctuations on capital structure on a sample of firms with the IPO dates between 1968 and 1998. This is hard to explain with the standard trade-off and pecking-order theories of capital structure (see Harris and Raviv (1992) and Myers (2001) for the review of capital structure theories). In an earlier paper Baker and Wurgler (2000) find some evidence in the 1928–1997 U.S. data that the higher share of total equity issues in corporate external financing precedes periods of low market returns. They claim this supports the view that managers time the market. They run regressions of market returns on some standard investment and financing variables using gross share issue figures. They say that the result would be similar if they included repurchases but in doing so they set issues at zero if the net figure is negative, which is the case in almost all recent years.

Hall and Murphy (2002) examine the difference between the value of stock options that can be traded, as given by the Black-Scholes (BS) model, as opposed to options with trading restrictions such as those granted to employees. They find that the value of their model employee option at various employee portfolio/wealth structures is approximately between 20 and 60 per cent of the BS figure for an at-the-money option. The value approaches the BS value the more risk-neutral and more-diversified i.e. holding less underlying stock the employee. This result indicates that options may be relatively less valuable for top executives than for young, talented employees, e.g. engineers, who may be almost risk-neutral and may not hold much company stock. Consequently, there is a difference between the cost of options to firms, as measured by the BS figure, and their value to employees. They show that incentives from employee options, as measured by option delta, are relatively largest at-the-money. It would be interesting to consider gammas as well. They compute cumulative probabilities of option exercise and explain why

many options are exercised early. The early exercise feature reduces the wedge between cost and value of compensatory options. Hall and Knox (2002) examine the performance of stock option plans based on the U.S. executive compensation data from 1992–2000. They find that these plans are frequently underwater, that companies rarely reprice options, but manage option plans by increasing option grants after large declines or increases in the stock market price. If such feature were largely predictable this would amount to a compound option feature in the plans.

3. How well can we understand the Microsoft and Cisco case using existing explanations?

Although Microsoft's repurchases had some anti-dilutive effect, boosting earnings was not their main motivation. The company bought back some 10% of its stock over a period of six years, 1997–2002, so the buyback effect was not pronounced in any single year. Microsoft had, and still has, the means to conduct buybacks on a much larger scale. Certainly, future cash flow signaling played no role, for this would have resulted in much higher repurchase activity. There is some evidence of undervaluation-linked repurchasing, as the activity increased recently when the market price of Microsoft's stock fell. But it may also signal deteriorated business opportunities. The agency problem could be substantial if we consider huge cash positions of many technology firms. It seems that neither company treats buybacks and dividends as substitutes. Stock option plans do seem to have only limited influence on the repurchase activity of both companies, and almost no influence in the case of Cisco, as they are ultimately dilutive. There is some support for the long-term timing theory in Cisco's behavior, since the management started buying back shares only recently after a large drop in the stock market price, while only moderate timing success can be observed in the short term. Certainly, the hypothesis that fast-growing companies prefer stock acquisitions finds support in Cisco's behavior. Pecking order related explanations indicating that companies issue stock when it is overvalued find little support, since, clearly, Cisco's stock price increased, but was also very volatile, during the years when it issued most shares. Although some of the target companies bought by Cisco were not privately-held, investors seem to have treated these M&A transactions in a way similar to private placements in the long term or, perhaps, just recognized that by paying with its highly-valued stock Cisco enhanced its growth opportunities.

4. Two modeling extensions

Cisco's and Microsoft's behavior provides mixed support for the stock-related transaction explanations advanced in recent research literature. Even so, it is frequently difficult to understand the details of the size and exact timing of their financial management activity through existing models and theo-

ries. I consider below two perspectives, whose exploration might lead to a better, and perhaps more quantitative, understanding of capital structure financial management:

4.1. Asset portfolio management, real options and the value of flexibility

Some companies prefer buybacks to dividends since repurchase programs give them more flexibility: repurchases can be timed, implemented at management's discretion, sometimes only partially. Dividend increases induce more permanent shareholder expectations, their reductions are not well received by investors and treated frequently as a signal of operating problems.

Existing financial contracting theories concentrate on a company which needs external funds. But some large technology firms keep substantial cash positions. To what extent repurchases and M&A payment choices are the result of asset portfolio restructurings between cash and risky assets? Here, the difference between changes in financing structure and adjustments in investment portfolio is blurred. Further, in arranging its stock-related transactions, e.g. in M&A processes, as well as in adjusting the asset composition, management may be aware of some additional existing real option values which might influence its choice (Grabowski (2002)). Such optionality may further impact the timing of managerial decisions. Asset risk may also influence the leverage choice (Leland (1998)).

4.2. The value of volatility and the impact of speculative investors

How do managerial decisions interact with market volatility? There are costs and benefits to high market price volatility. Some of them result from hedging or its absence. Due to high volatility companies could time their option grants. High stock volatility makes options more valuable and also easier to exercise. This increases option tax benefits. The volatility effect is opposite in case of debt, where volatility reduces potential debt tax shield value and makes hedging more valuable. It seems that very fast market price growth makes buybacks less practicable. On the other hand, dilution accounting rules make the dilution potential of options more pronounced in a rising stock market.

Many existing models concentrate on small and venture capital stage companies and conflicts of interest between various classes of their shareholders. For large companies there are also several classes of shareholders, most notably portfolio investors. Portfolio investors may have less interest in, and less access to, corporate management details, and concentrate mainly on potential speculative capital gains. Managers may take it into account when timing security issues and repurchases and placing various kinds of securities e.g. convertibles on the market to reduce financing costs. In this way they become frequently like portfolio managers themselves, trying to time their operations, and similarly they can make timing mistakes. Volatility may com-

plicate the implementation of some strategies, like repurchase programs further and impact managerial timing considerably, increasing the probability of suboptimal decisions.

The investigation of concrete corporate cases and the above decision factors may result in the formulation of more realistic managerial objective functions. The insight of corporate financial theories is that capital structure is linked to specific managerial incentives and objectives (Myers (2000), Hart (2001), Zwiebel (1996)). The advance from firm-theoretic models of capital structure to more practical ones, which could be a guide for a financial manager might rely on such extended formulations taking into account real-option content of managerial decisions and their interaction with volatile speculative markets for corporate securities.

Data

The Microsoft and Cisco data are from the quarterly and annual reports of these companies.

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