NORMATIVE ASPECTS OF STOCK MARKET EFFICIENCY

Marcel Kahan

Discussion Paper No. 52

3/89

Program in Law and Economics
Harvard Law School
Cambridge, MA 02138

The Program in Law and Economics is supported by a grant from the John M. Olin Foundation.

Normative Aspects of Stock Market Efficiency

by

Marcel Kahan*

---

* Visiting John M. Olin Scholar, Harvard Law School; Associate, Kramer, Levin, Nessen, Kamin & Frankel, New York. I would like to thank Reinier Kraakman, Louis Kaplow, Lucian Bebchuk, Hal Scott and Steven Shavell for their helpful comments and acknowledge the financial assistance from the John M. Olin Foundation.

ABSTRACT

This essay provides a framework for analyzing why efficient stock markets -- that is, stock markets in which the share price accurately reflects company value -- are socially desirable. First, this essay will differentiate among the various ways in which stock markets might be inefficient. Then it will analyze the various reasons why stock market inefficiencies might cause social losses. In particular, this essay will consider the connection between stock market efficiency and the demand for capital by companies, the supply of capital by investors, the market for corporate control, and the informational content of stock prices. In each of these instances, this essay will examine what kinds of stock market inefficiencies are likely to cause social losses. Finally, this essay will present two examples of legal regulations that are argued to make the stock market more efficient; the framework developed in this essay will then be used to evaluate whether the increased stock market efficiency that would result from these regulations is socially desirable.

Various aspects of stock market efficiency have been analyzed in both the legal and the economic literature. Studies have dealt with issues like what distinguishes different forms of stock market efficiency[1], whether markets are efficient[2], what makes markets efficient[3] and what policy implications stock market efficiency has[4]. However, they have not focused on the normative aspects of stock market efficiency[5]: whether and why efficient stock markets

---

[1] See e.g. Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, 25 J. Fin. 383 (1970); Tobin, On the Efficiency of the Financial System, Lloyds Bank Rev., July 1984 at 1.

[2] See e.g. Dann, Mayers & Raab, Trading Rules, Large Blocks and the Speed of Adjustment, 4 J. Financial Econ. 3 (1977) (effect of large block sales); Jensen, The Performance of Mutual Funds in the Period 1945-64, 23 J. Fin. 389 (1968); Wang, Some Arguments that the Stock Market is Not Efficient, 19 U.C. Davis L. Rev. 341 (1986).

[3] See Gilson & Kraakman, The Mechanisms of Market Efficiency, 70 Va. L. Rev. 549 (1984).

[4] See e.g. Note, The Efficient Capital Market Hypothesis, Economic Theory and the Regulation of the Securities Industry, 29 Stan. L. Rev. 1031 (1977); Banoff, Regulatory Subsidies, Efficient Markets, and Shelf Registration: An Analysis of Rule 415, 70 Va. L. Rev. 135 (1984); Fischel, Efficient Capital Market Theory, the Market for Corporate Control, and the Regulation of Cash Tender Offers, 57 Tex. L. Rev. 1 (1978); Gordon & Kornhauser, Efficient Markets, Costly Information and Securities Research, 60 N.Y.U. L.Rev. 761 (1985) (implications of relative efficiency).

[5] Some commentators have, however, analyzed parts of the issues presented in this paper. In particular, the analysis of inefficiency in the primary market and of the market for control build on papers by Myers & Majluf, Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have, 13 J. Fin. Econ. 187 (1984) and Schwartz, The Fairness of Tender Offer Prices in

are socially desirable. This essay will try to present an analytical framework for analyzing the ways in which different forms of stock market inefficiency can cause social losses[6].

At first, it might seem superfluous to analyze the normative aspects of efficiency. As commonly used, the term efficiency incorporates normative elements. For example, we call arrangements efficient if they make[7], or have the potential to make[8], at least one person better off without making anybody else worse off. However, when used in

---

Utilitarian Theory, 17 J. Legal Stud. 165 (1988); Easterbrook & Fischel, Auctions and Sunk Costs in Tender Offer Prices, 35 Stan. L. Rev. 1 (1982); and Bebchuk, The Sole Owner Standard for Takeover Policy, 17 J. Legal Stud. 197 (1988), respectively. Other commentators have briefly stated some of the reasons why efficient markets are important without analyzing them in greater detail. See e.g. Gordon & Kornhauser, Efficient Markets, Costly Information and Securities Research, 60 N.Y.U. L.Rev. 761 (1985) (efficient markets lead to good savings decisions by individuals and investment decisions by firms); Fischer & Merton, Macroeconomics and Finance: The Role of the Stock Market, in K. Brunner & A.H. Meltzer Essays on Macroeconomic Implications of Financial and Labor Markets and Political Processes (1984) (macroeconomic effects of market inefficiency); and various articles on insider trading. With the exception of Myers and Majluf, these articles generally do not distinguish between various kinds of inefficiencies.

[6] This essay will, however, not consider distributional and fairness arguments for the desirability of stock market efficiency.

[7] This is the definition of Pareto efficiency; see e.g. Colemann, Efficiency, Utility and Wealth Maximization, 8 Hofstra L. Rev. 509, 512-513 (1980).

[8] This is the definition of Kaldor-Hicks or potential Pareto efficiency; see e.g. Colemann, Efficiency, Utility and Wealth Maximization, 8 Hofstra L. Rev. 509, 513-514 (1980).

connection with stock markets, "efficiency" refers to the degree to which information is reflected in the stock price, and not to whether investors are better or worse off[9]. For example, semi-strong form efficiency refers to a stock market in which stock prices reflect all publicly available information[10]. Thus, it is necessary to demonstrate why efficient stock markets are socially desirable, if indeed they are.

The lack of concern about the normative aspects of stock market efficiency is all the more surprising as several aspects of the securities laws are intended to make[11], and have the effect of making[12] stock markets more efficient. For example, the corporate disclosure

---

[9] Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, 25 J. Fin. 383 (1970)

[10] Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, 25 J. Fin. 383 (1970).

[11] See Brudney, Insiders, Outsiders, and Informational Advantages under the Federal Securities Laws, 93 Harv. L. Rev. 322, 334 (1979); Anderson, The Disclosure Process in Federal Securities Regulation: A Brief Review, 25 Hastings L. J. 311 (1974); Knauss, Disclosure Requirements -- Changing Concepts of Liability, 24 Bus. Law. 43 (1968). Other goals might include the protection of public investors from overreaching, discouragement of actions that corporations would be reluctant to disclose, and reduction in shareholder monitoring and information search costs.

[12] See e.g. Gilson & Kraakman, The Mechanisms of Market Efficiency, 70 Va. L. Rev. 549, 635-642 (1984); Fischel, Efficient Capital Market Theory, the Market for Corporate Control, and the Regulation of Cash Tender Offers, 57 Tex. L. Rev. 1 (1978); Coffee, Market Failure and the Economic Case for a Mandatory Disclosure System, 70 Va. L. Rev. 717 (1984).

requirements under the Securities and Exchange Acts[13], the disclosure provisions of the Williams Act[14], the filing requirements for statutory insiders[15] and the various anti-fraud provisions[16] can serve to convey more and better information to the stock market and thus to make it more efficient. The rules against insider trading[17] are on one hand defended as eliminating incentives to keep inside

---

[13] Securities Act of 1933, Section 10, 15 U.S.C. 77j (information required in prospectus); Securities Exchange Act of 1934, Sections 12 and 13, 15 U.S.C. 781, 78m (registration requirements and periodical reports). There is an ongoing controversy about whether the disclosure requirements provide any information to the market that would not have been provided otherwise. See Seligman, The Historical Need for a Mandatory Disclosure System, 9 J. of Corp. L. 1 (1983); Coffee, Market Failure and the Economic Case for a Mandatory Disclosure System, 70 Va. L. Rev. 717 (1984); Dennis, Mandatory Disclosure Theory and Management Projections: A Law and Economics Perspective, 46 Maryland L. Rev. 1197, 1205-1211 (1987); Langevoort, Information Technology and the Structure of Securities Regulation, 98 Harv. L. Rev. 747, 781-786 (1985) arguing that they do and Benston, Required Disclosure and the Stock Market: An Evaluation of the Securities Exchange Act of 1934, 63 Am. Econ Rev. 132 (1973); Stigler, Public Regulation of the Securities Market, 37 J. Bus. 117 (1964) arguing that they do not.

[14] Securities Exchange Act of 1934, Section 13(d), 15 U.S.C. 78m(d). Even critics of the Williams Act believe that it serves to provide new information to the market. See Fischel, Efficient Capital Market Theory, the Market for Corporate Control, and the Regulation of Cash Tender Offers, 57 Tex. L. Rev. 1 (1978).

[15] Securities Exchange Act of 1934, Section 16(a).

[16] See e.g. Securities Exchange Act of 1934, Sections 10(b); 14(e); 15(c) and 18(a).

[17] See Rule 10b-5 under the 1934 Act, 17 C.F.R. Section 240.10b-5, as interpreted by Matter of Cady, Roberts & Co., 40 S.E.C. 907 (1961) and subsequent decisions; see generally Clark, Corporate Law, at 309-340 (1986).

information private and thus as making the market more efficient[18]; and on the other hand attacked as preventing insiders from "disclosing" insider information through insider trading[19]. The benefits of these laws in improving market efficiency depend on whether the kind of market inefficiency they eliminate is undesirable. For example, the reader should consider why, if at all, we should care whether the stock price reflects preliminary merger negotiations one month earlier rather than one month later[20]. In Section VI, I will consider this and another example and show how the approach developed in this essay can be used to evaluate the benefits of laws that might improve stock market efficiency.

Section I will present a short overview about the various kinds of inefficiencies that might affect the stock

---

[18] See e.g. Schotland, Unsafe at any Price: A Reply to Manne, 53 Va. L. Rev. 1425, 1448 (1967); Mendelson, The Economics of Insider Trading Reconsidered, 117 U. Pa. L. Rev. 470, 489 (1969); see also Note, The Inadequacy of Rule 10b-5 to Address Outside Trading by Reporters, 38 Stan. L. Rev. 1549, 1565-1570 (1986) (disclose and refrain rule should also apply to non-insiders in order to improve market efficiency).

[19] Carlton & Fischel, The Regulation of Insider Trading, 35 Stan. L. Rev. 857, 866-868 (1983); Note, The Efficient Capital Market Hypothesis, Economic Theory and the Regulation of the Securities Industry, 29 Stan. L. Rev. 1031, 1073-1075 (1977); see also Gilson & Kraakman, The Mechanisms of Market Efficiency, 70 Va. L. Rev. 549, 629-635 (1984), on how trading discloses information.

[20] The duty to disclose preliminary merger negotiations was the subject of the recent Supreme Court case Basic v. Levinson, 108 S.Ct. 978 (1988).

market. In Sections II to V, I will consider the various ways in which stock market inefficiencies can cause social losses. In the first three of these Sections, I will investigate how stock prices influence stock buying and selling decisions. Section II will consider the effect of stock prices on the demand for equity capital by companies. I will show that, by affecting the cost of equity, stock prices influence investment and financing decisions. Section III will deal with the supply of capital by investors. Here, I will focus on the effect of stock market inefficiencies on the expected return and the risk of stocks. Section IV will analyze the connection between stock prices and the market for control.

In Section V, I will consider how stock prices, through their informational content, affect decisions other than buying and selling of stocks. In particular, I will analyze which stock market inefficiencies are likely to lead to inferior capital budgeting decisions and to inferior management compensation and evaluation decisions; and how stock price oriented management behavior can cause social losses. In Section VI, I will use the approach developed in this essay to analyze two issues: whether requiring companies to disclose (or not misinform about) ongoing merger negotiations[21] and whether permitting insider trading

---

[21] See also Basic v. Levinson, 108 S.Ct. 978 (1988) (company may not misinform about merger negotiations, but is not required to disclose them).

create a kind of stock market efficiency that is socially desirable. Section VII will conclude the essay.

I. A Taxonomy Of Stock Market Inefficiencies

For purposes of this essay, I will define a stock market as efficient if the stock price at all times constitutes the best estimate about the discounted value of all future cash flows to the stockholder[22], i.e. dividends and liquidation premia[23], on the basis of all available information[24]. Even though that degree of stock market

---

[22] The stock price in efficient markets will reflect these cash flows to investors and not the net asset value of the company. If these cash flows have a value below the net asset value, it would be consistent with the efficient market hypothesis if the stock price is below the net asset value. See also Kraakman, Taking Discounts Seriously: The Implications of "Discounted" Share prices as an Acquisition Motive, 88 Col. L. Rev. 891 (1988) (finding that in many cases the stock price is below net asset value).

[23] This essay will not be concerned with the efficient pricing of voting rights owned by the shareholders. There is empirical evidence that voting rights have an impact on share prices. See Levy, Economic Evaluation of Voting Power of Common Stock, 38 J. Fin. 78 (1983); Lease, McConnell & Mikkelson, The Market Value of Control in Publicly Traded Corporations, 11 J. Fin. Econ. 439 (1983); see also Dodd & Warner, On Corporate Governance: A Study of Proxy Contests, 11 J. Fin. Econ. 401, 429-431 (1983). For some theoretical analysis of voting, see Easterbrook and Fischel, Voting in Corporate Law, 26 J. of L. & Econ. 395 (1983); Grossman & Hart, One Share -- One Vote and the Market for Corporate Control, 20 J. Fin. Econ. 175 (1988).

[24] This is the strong form definition of capital market efficiency. Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, 25 J. Fin. 383, 409 (1970).

efficiency is in reality unattainable[25], it will serve as a useful yardstick in analyzing why certain kinds of stock market inefficiencies are undesirable.

There are various ways in which stock markets might not be perfectly efficient. First, the stock price might not reflect non-public information. In that case, the stock price would not fully reflect insider information, as defined by law[26]; but the stock market would also not reflect non-public information that is not within the legal definition of insider information, e.g. a raider's estimate of the value of a company under his control. Empirical evidence strongly suggests that stock prices do not fully reflect non-public information[27]. This kind of inefficiency can be eliminated by having the non-public information disclosed.

Second, given a set of information, the stock price might not constitute the best price estimate of the value of the company. Such information processing inefficiencies

---

[25] Grossman & Stiglitz, On the Impossibility of Informationally Efficient Markets, 70 Amer. Econ. Rev. 393 (1980) (informationally efficient markets impossible where information is costly).

[26] To constitute insider information, the information must be material and the person holding the information must be under a duty not to use it. Dirks v. S.E.C., 463 U.S. 646, 103 S.Ct. 3255 (1983); Chiarella v. U.S., 445 U.S. 222 (1979).

[27] See e.g. Jaffe, The Effect of Regulation Changes on Insider Trading, 5 Bell J. of. Econ. 93 (1974); Finnerty, Insiders and Market Efficiency, 31 J. Fin. 1141 (1976) (both studies finding that insiders make abnormal profits).

might be firm specific, they might affect a group of firms, or even the whole economy. These inefficiencies can generally not be eliminated by making more information public[28].

Firm specific inefficiencies would result if some analysts, by studying a company in detail, could consistently arrive at better estimates of its value. These analysts should make abnormal profits[29] by trading upon their estimates. Some studies have shown that profits can be made by following analysts' forecasts[30] and that stock prices react to the publication of such forecasts[31]. These studies would indicate that the analysts who prepare the forecasts could outperform the market. Other studies, however, have shown that mutual funds, who are supposedly run by such analysts, do not outperform the market[32].

---

[28] One might be able to eliminate them by making public a trading strategy that would make abnormal profits. If enough investors adopt that strategy, they will eliminate the opportunity for abnormal profits.

[29] Abnormal profits are profits that exceed those to be earned on stocks with identical risk characteristics. Cf. Wang, Some Arguments that the Stock Market is not Efficient, 19 U.C. Davis L. Rev. 341, 349 (1986).

[30] Dimson & March, An Analysis of Brokers' and Analysts' Unpublished Forecasts of UK Stock Returns, 39 J. Fin. 1257 (1984).

[31] Davies & Canes, Stock Prices and the Publication of Second Hand Information, 51 J. Bus. 43 (1978).

[32] See Jensen, The Performance of Mutual Funds in the Period 1945-64, 23 J. Fin. 389 (1968) (even before costs are subtracted, funds do not outperform the market); Mains, Risk, the Pricing of Capital Assets, and the Evaluation of

Individual shares might also be mispriced because the impact of speculative noise traders is too strong to be balanced out by informed traders[33]. In that case, the stock price could also reflect the speculative noise, and not only the information about the value of the company. Studies showing that the trading of stocks increases volatility in their prices would be consistent with the existence of such noise[34].

Another frequently voiced suspicion is that stock markets systematically misvalue certain kinds of companies. Empirical studies have found some, though far from conclusive, evidence that stock markets undervalue small companies[35], undervalue companies with low price earnings ratios[36], undervalue companies that have in the past

---

Investment Portfolios, 50 J. Bus. 371 (1977) (funds do not outperform the market after costs are subtracted).

[33] See Black, Noise, 41 J. Fin. 529 (1986); DeLong, Shleifer, Summers & Waldmann, The Economic Consequences of Noise Trading, (CRSP Working Paper No. 218, Sept. 1987).

[34] See French & Roll, Stock Return Variances: The Arrival of Information and the Reaction of Traders, 17 J. Fin. Econ. 5 (1986).

[35] Reinganum, Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings Yields and Market Values, 9 J. Fin. Econ. 19 (1981); Banz, The Relationship between Return and Market Value of Common Stock, 9 J. Fin. Econ. 3 (1981). The abnormal returns could also result from tax effects or misspecified capital asset prices rather than stock market inefficiency.

[36] Reinganum, Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings Yields and Market Values, 9 J. Fin. Econ. 19 (1981); Basu, Investment Performance of Common Stocks in Relation to Their price-

performed poorly[37] or undervalue companies in certain industries[38]. Some commentators have also alleged that the market is myopic, i.e. that it focuses excessively on short run profits and undervalues companies that take a long view[39].

At last, the inefficiency might affect the stock market as a whole. It has been suggested that the market might generally overreact to new information causing greater stock

---

Earnings Ratios: A Test of the Efficient Market Hypothesis, 32 J. Fin. 663 (1977).

[37] DeBondt & Thaler, Does the Stock Market Overreact?, 40 J. Fin. 793 (1985).

[38] See e.g. Thompson, The Information Content of Discounts and Premiums on Closed End Fund Shares, 6 J. Financial Econ. 151 (1978) (market undervalues closed end mutual funds); see also Kraakman, Taking Discounts Seriously: The Implications of "Discounted" Share prices as an Acquisition Motive, 88 Col. L. Rev. 891 (1988).

[39] Graham, Dodd & Cottle, Securities Analysis, at 424 (4th ed. 1962); Lipton, Corporate Governance in the Age of Finance Corporatism. 136 U. Pa. L. Rev. 1, 23-25 (1987); Lowenstein, Pruning Deadwood in Hostile Takeovers: A Proposal for Legislation, 83 Col. L. Rev. 249, 280 (1983); Schwartz, Defining the Corporate Objective: Section 2.01 of the ALI's Principles, 52 Geo. Wash. L. Rev. 511, 527-528 (1984); Dunleavy, Leveraged Buyouts, Management Buyouts, and Going Private Corporate Control Transactions: Insider Trading or Efficient Market Economics?, 14 Ford. Urb. L. J. 685 (1986); see also Stein, Takeover Threats and Managerial Myopia, 98 J. Pol. Econ. 61 (1988) (modeling the effects of market myopia on managerial behavior); but see McConnell & Muscarella, Corporate Capital Expenditure decisions and the Market Value of the Firm, 14 J. Fin. Econ. 399 (1985) (finding that stock prices increase when investment decisions are announced); Pakes, On Patents, R & D, and the Stock Market Rate of Return, 93 J. Pol. Econ. 390 (1983) (finding positive correlation between R & D expenditures and stock prices).

price volatility than warranted[40]. An particular form of excess volatility would have stock prices rise too high during bull markets and fall too low during bear markets[41]. There is also some evidence that the stock market generally undervalues companies[42]. At last, it has been alleged that the stock market systematically misjudges the effects of inflation on stock prices[43].

Moreover, most of these inefficiencies also contain a time dimension. In other words, they might cause temporary rather than permanent mispricing. For example, after a

---

[40] See e.g. Schiller, Do Stock prices Move Too Much to be Justified by Subsequent Changes in Dividends, 71 Am. Econ. Rev. 421 (1981); see also Fama & French, Permanent and Temporary Components of Stock Prices, 98 J. Pol. Econ. 246 (1988) (finding long run mean reverting behavior but raising the possibility that such effect is caused by changes in the discount rate rather than stock market inefficiency). There is, however, an ongoing dispute over the methodology of these studies. See e.g. Merton, On the Current State of the Stock Market Rationality Hypothesis in Stanley Fischer (ed.), Macroeconomics and Finance: Essays in Honor of Franco Modigliani (1986). See also Charesi, Dividend Information, Stock Returns and Market Efficiency II, 6 J. Financial Econ. 151 (1978) (stock market underreacts to dividend changes).

[41]. Graham, Dodd & Cottle, Securities Analysis, at 39-44 (4th ed. 1962). Bosworth, Stock Market and Economy, 2 Brookings Papers on Economic Activity 253, 286 (1975) (stock market declined to far during 1973-74 recession).

[42] See Kraakman, Taking Discounts Seriously: The Implications of "Discounted" Share Prices as an Acquisition Motive, 88 Col. L. Rev. 891 (1988).

[43] Modigliani & Cohn, Inflation, Rational Valuation and the Market, Fin. Anal. J., Mar. 1979, at 24 propose this as explanation for the declining rates of returns during inflationary periods. But see e.g. Stulz, Asset Pricing and Expected Inflation, 41 J. Fin. 209 (1986) for an alternative hypothesis.

speculative bubble bursts, stock prices might no longer be misvalued on account of speculative noise. Or undervaluation of companies that, in the past, have performed poorly, would end once their performance picks up.

While this list of possible inefficiencies is not exhaustive, it contains many of the most frequently asserted and best documented stock market inefficiencies. One should, however, be careful to jump to the conclusion that gross stock market inefficiencies have been shown to exist. Many of the studies arriving at results seemingly inconsistent with stock market efficiency suffer from methodological flaws[44] or are subject to alternative interpretations[45]. And one should also keep in mind the large number of studies concluding that the stock market is efficient[46].

---

[44] See e.g. Merton, On the Current State of the Stock Market Rationality Hypothesis in Stanley Fischer (ed.), Macroeconomics and Finance: Essays in Honor of Franco Modigliani (1986) (flaws in studies finding excess volatility).

[45] Reinganum, Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings Yields and Market Values, 9 J. Fin. Econ. 19 (1981) (excess profits can be result of misspecified asset pricing model).

[46] See e.g. Sunder, Stock Price and Risk Related Accounting Changes in Inventory Valuation, 50 Accounting Rev. 305 (1975); Kaplan & Roll, Investor Evaluation of Accounting Information Changes: Some Empirical Evidence, 45 J. Bus. 225 (1972); Fama, Fischer, Jensen & Roll, The Adjustment of Stock Prices to New Information, 10 Int. Econ. Rev. 1 (1969). For an overview, see also Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, 25 J. Fin. 383 (1970), and Merton, On the Current State of the Stock Market Rationality Hypothesis in Stanley Fischer (ed.), Macroeconomics and Finance: Essays in Honor of Franco Modigliani (1986).

The way in which stock prices do not reflect the discounted value of cash flows will depend on the way in which the stock market is inefficient. For example, if insider information is not reflected in the stock price, some stocks, i.e. those for which the information is positive, will be overpriced while others will be underpriced; and the mispricing will continue until the information is disclosed. If the stock market exaggerates the boom and bust cycle, all stocks will be overpriced during a bull and underpriced during a bear market. If small companies are permanently undervalued, changes in their stock price might still accurately reflect changes in their value. As I will point out in the following Sections, whether and why stock market inefficiency is undesirable will depend, to a large extent, on the nature of the inefficiency.

II. The Demand For Capital By Companies

This Section will analyze how inefficiencies in the stock market can affect the demand for capital by corporations and how these effects can cause social losses. I will first show how social losses can result when stocks are mispriced at their public offering. Then, I will extent the analysis to mispricing in other transactions through which companies manifest their demand for capital. At last, I will consider to what extent the existence of other market

imperfections demand modifications in the analysis.

A. Stock Market Inefficiency at Public Offerings of Shares

Companies express their demand for capital by engaging in capital market transactions. Most significantly, companies raise equity through public offerings of shares. These transactions occur in the so called primary market, i.e. the market where shares are sold by the company or by the underwriter to the public. By contrast, it is the secondary market, where shares are traded among investors, which usually receives most of the attention. For example, the stock market indices are based on the secondary market[47], most business news affect the stock price in the secondary market[48], most of the academic literature on stock market efficiency relates to that market[49], and most trades occur

---

[47] See e.g. Phyllis Pierce (ed.), The Dow Jones Investor's Handbook 1988, (1988) at 12 (explaining how Dow Jones indices are compiled).

[48] See e.g. Dorfman & Salwen, Oil Stocks Win Temporary Favor, Wall Street Journal, Nov. 29, 1988, at C1; Steptoe, Favorable News Boosts Amgen, Lotus But Otherwise MArket's Blahs Continue, id. at C6; Equity Prices Drop Sharply on Big Exchanges, Partly on Concern U.S. Fed Will Tighten Credit, id. at C12; Group Discloses Stake of 6.39% in Staklee; May Seek Control, id. at B10.

[49] Only a small number of studies focus on the primary market; see e.g. Reilly & Hatfield, Investor Experience with New Stock Issues, Fin. Analysts J., Sept. 1969 at 73; McDonald & Fisher, New Issue Stock Price Behavior, 27 J. Fin. 97 (1972); Ibbotson, Price Performance of Common Stock New Issues, 2 J. Financial Econ. 235 (1975).

in the secondary market[50]. The difference between the primary and the secondary market should be kept in mind since, as I will argue, the primary rather than the secondary market influences investment and financing decisions[51].

The price at which a company can offer shares to the public can create social losses by inducing companies to make inferior investment and financing decisions. Optimally, a company should invest in all projects that create social gains, i.e. whose social rate of return exceeds their social cost of capital. A capital market that leads to such decisions is allocative efficient[52]. For example, a company should undertake a project requiring an investment of $100 this year and producing social gains of $110 next year if the social cost of capital is less than 10%, but not if the cost is higher.

Furthermore, a company should, optimally, finance

---

[50] From 1981 to 1984, the average value of common stock newly issued was about $23 billion. Herbert Dougall & Jack Gaumnitz, Capital Markets and Institutions, (5th ed. 1986) at 226. The 1986 dollar volume of trades on the New York Stock Exchange alone was over $1,374 billion. N.Y. Stock Exchange Fact Book 1987 (1987).

[51] Primary market efficiency is also important for inducing corporation to adopt optimal charter provisions. Cf. Bebchuk, Freedom of Contract and the Corporation: An Essay on the Mandatory Role of Corporate Law, forthcoming, Harvard Law Review.

[52] See e.g. Gordon & Kornhauser, Efficient Markets, Costly Information and Securities Research, 60 N.Y.U. L.Rev. 761, 769 (1985).

projects in a way that minimizes the social cost of financing, i.e. it should choose the debt equity structure that involves the lowest social costs. There are two ways in which the debt equity structure can affect the social cost of financing[53]. First, the debt equity structure affects bankruptcy costs. The higher the level of debt is, the higher is the probability of bankruptcy and thus the expected transaction costs of resolving the bankruptcy[54].

Second, the debt equity structure can affect agency costs, i.e. costs that result when managers act in their own interest rather than maximize the value of the company[55]. For example, equity can create agency costs by enabling managers to reinvest profits in low return projects rather than returning them to the shareholders. Debtholders, on the other hand, have to be paid their interest and principal, and managers would not be free to reinvest into low return

---

[53] The company's cost of capital will not be affected by the way in which risk is divided between the debtholders and the equityholders. Modigliani & Miller, The Cost of Capital, Corporate Finance, and the Theory of Investment, 48 Am. Econ. Rev. 261 (1958).

[54] Baxter, Leverage, Risk of Ruin and the Cost of Capital, 22 J. Fin. 395 (1967)

[55] Jensen & Meckling, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, 3 J. Financial Econ. 305 (1976); Jensen, Agency Costs of Free Cash Flows, 76 Am. Econ. Rev. 323 (1986); Myers, Determinants of Corporate Borrowing, 5 J. Financial Econ. 147 (1977).

projects[56]. Debt can as well create agency costs. For example, debt creates the potential for gambling, i.e. for investing in risky low expected return projects. If the project is successful, the shareholders would pocket the gain; if not, they would declare bankruptcy and the debtholders would be left with the losses[57]. From the social perspective, a company should choose the debt equity structure that minimizes these agency and bankruptcy costs.

Inefficiencies in the primary market for stocks can lead companies to make inferior investment and financing decisions. Assume, for example, Sylvia Bobs wants to start up a small computer company, Orange Inc. Sylvia is willing to invest $1 million of her own money into Orange. She considers to raise an additional $9 million by selling shares to the public. If Sylvia does not go public, she expects annual profits of $120,000; if she raises another $9 million, annual profits would be $1.2 million. Also assume that the proper discount rate is 10%.

In an efficient market, Sylvia could raise $9 million by selling 75% of the shares to the public. At a discount rate of 10%, the value of annual profits of $1.2 million is $12 million and 75% of $12 million is $9 million. This would

---

[56] Jensen, Agency Costs of Free Cash Flows, 76 Am. Econ. Rev. 323 (1986).

[57] Jensen & Meckling, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, 3 J. Financial Econ. 305 (1976).

leave Sylvia with 25% of Orange Inc.; i.e. with $300,000 per year. As this is more than $120,000, Sylvia would decide to expand. This is socially desirable. The value of Orange would increase from $1.2 million to $12 million; i.e. the investment of $9 million would create a net social gain of $1.8 million.

Assume, however, that the primary market is not efficient. Because the primary market undervalues computer companies, Bobs would have to sell 95% of Orange shares to raise $9 million. Then Sylvia would decide not to go public even though expansion is in socially desirable[58]. Similarly, if Orange were overvalued, Sylvia might decide to offer equity even if an expansion is undesirable.

Rather than forego the expansion, Sylvia might decide to take on debt. Assume that agency and bankruptcy costs would be minimized by raising all the $9 million in equity. Taking on $9 million in debt would increase these costs by $1 million. Sylvia would then decide to raise the $9 million in debt. Her cost, including increased agency costs, of raising these funds would be $10 million. Her share of Orange, if expanded, would then be $2 million, that is $800,000 more than the value of Orange if not expanded[59].

---

[58] Cf. Myers & Majluf, Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have, 13 J. Fin. Econ. 187, 188 (1984).

[59] Some forms of stock mispricing might also lead to a mispricing of bonds. Specifically, this will be the case if expectations in stock markets and bond markets are

Note that, for these effects to occur, it is not necessary that Bobs knows that the primary market misvalues Orange. Assume Bobs knows that, if not expanded, the value of Orange is $1.2 million. If she must offer 95% of Orange

---

integrated, and the mispricing is based on erroneous expectations about the cash flows to the company, rather than about cash flows to the shareholders, the variance of cash flows, noise trading, or sunspots. E.g., if both the stock market and the bond market base stock and bond prices on underestimated cash flows to the company, both stocks and bonds will be undervalued. If, however, stock markets and bond markets base prices on different expectations about cash flows, or, for instance, on the same (erroneous) expectations about the variance of cash flows, undervalued stock prices will not necessarily lead to undervalued bond prices. In the latter case, they should instead lead to overvalued bond prices. Cf. Myers & Majluf, Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have, 13 J. Fin. Econ. 187, 197 (1984).

But even if stock and bond markets share mistaken cash flow expectations, the effect on bond prices will, for most companies, be minimal. As most stocks are valued as call options that are deep in the money, most of the misestimate in the value of the company (debt plus equity) will be born by the stockholders, not the bondholders. Black & Scholes, The Pricing of Options and Corporate Liabilities, 81 J. Pol. Econ. 637 (1973).

It should also be noted that investment banks, when they issue a new bond, engage in comparative pricing, i.e. they determine the interest rate with reference to interest rates paid by other companies with similar risk ratings. Private information. Stock prices are generally not a significant element in determining the risk rating of bonds. Moody's Industrial Rating: Introduction (1988) (stock price not mentioned among rating criteria). Therefore, isolated mispricings of stocks should not affect bond prices. Stock mispricing could, however, have an effect on bond prices if all stocks of companies with similar risk characteristics were mispriced and stock and bond markets are related in the way described above. Also note that were the mispricing is based on asymmetric information, managers might be able to convey that information to banks and rating agencies. Cf. Campbell, Optimal Investment Financing Decisions and the Value of Confidentiality, 14 J. Fin. & Quant. Analysis 913 (1979).

to raise $9 million, the market value of her 5% share would be only about $474,000. Then, if Sylvia assumes that the primary market values Orange correctly, she would also decide not to go public. Thus, any misvaluation by the primary market will tend to affect investment and financing decisions.

To summarize, social losses can arise either through inferior investment or through inferior financing decisions. In the former case, losses consist of the social gains that would have been created by optimal investments. In the latter case, losses consist of the increased bankruptcy and agency costs. Whether misvaluation will affect investment or financing depends on the relative losses of non-optimal decisions. Assume, for example, that the proposed investments create only minimal gains. Then, even if bankruptcy and agency costs increased by little, an undervalued company might decide to forego an expansion. Assume, however, that using debt rather than equity to finance investments does not create any agency and bankruptcy costs. Then, a company's investment decisions would be unaffected by an undervaluation. In fact, as the different debt equity structure does not increase costs of financing, the undervaluation would not cause any social losses.

B. Self Tender Offers and Trades in Treasury Shares

In this Subsection, I will extent the analysis of mispricing at the public offering of shares to mispricing in other transactions. Conceptually, stock mispricings will have the same effects whenever a company engages in capital market transactions. Besides public offerings of shares, such transactions include self tender offers and trades in treasury shares[60]. For example, an undervalued share price might lead a company to make a self tender and thus either to invest less or to take on more debt. However, if a company does not undertake any of these transactions, the stock price will not directly influence investment and financing decisions. I.e., an undervalued share price by itself does not mean that the company has fewer funds available forcing it either to invest less or to take on more debt. Thus, unless a company engages in a capital market transaction, stock mispricing will not affect investment and financing decisions.

Some remarks are therefore in order about self tender

---

[60] Empirical evidence indicates that self tender offers are motivated by a low share price. See e.g. Vermaelen, Common Stock Repurchases and Market Signaling: An Empirical Study, 9 J. Financial Econ. 139 (1981) (empirical evidence most consistent with hypothesis that share repurchases signal positive information); Dann, Common Stock Repurchases: An Analysis of Returns to Bondholders and Stockholders, 9 J. Financial Econ. 113 (1981) (share repurchases signal positive information). Trades in treasury shares, however, are primarily motivated by other reasons. See Guthart, Why Companies are Buying their Own Stock, 23 Financial Analysts J. 105 (1967); Austin, Treasury Stock Reacquisitions by American Companies 1961 -1967, Fin. Exec., May 1969, at 41.

offers and trades in treasury shares. First, self tender offers are rare and discreet events. One study has found only about 250 instances of self tender offers in the 16 years between 1963 and 1978, i.e. an average of less than 16 tender offers per year[61]. As self tenders occur infrequently, mispricing in these transactions is of relatively small quantitative importance.

Trades in treasury shares, on the other hands, occur frequently. But in most of such trades, companies purchase only small amounts of stock[62]. For several reasons, it is unlikely that stock mispricing with respect to such low volume trades will cause significant social losses. First, raising debt to make up for the reduction in equity caused by the repurchase of treasury shares would involve only a minor shift in the debt equity structure. However, minor changes in the debt equity structure are unlikely to affect the cost of financing[63]. But if the company can easily use

---

[61] Masulis, Stock Repurchase by Tender Offer: An Analysis of the Causes of Common Stock price Changes, 35 J. Fin. 305, 307 (1980).

[62] See Stewart, Should a Corporation Repurchase its Own Stock?, 31 J. Fin. 911, 914 (1976) (In 1972, 960 companies traded less than .25% of their shares, 704 traded between .25% and 1.24%, and only 28 traded more than 5.25%.); Austin, Treasury Stock Reacquisitions by American Companies 1961 -1967, Fin. Exec., May 1969, at 42-45 (most reacquisitions involve small amounts).

[63] Economists have not come to firm conclusions of how the optimal capital structure of a company looks like. Some economists believe that companies cannot lower its cost of capital by exploiting different tax treatments of debt and equity. Miller, Debt and Taxes, 32 J. Fin. 261 (1977). The

debt instead of equity financing, the mispricing will cause no social losses. Second, rather than incur more debt, the company could reduce dividends. In that case as well, investment decisions might remain unaffected[64]. Third, even if the company decided to invest less rather than raise debt or cut dividends, social losses would tend to be small. Losses would consist of the net gains that would have resulted from the investment. But as a company would only have to cut few investment projects, and as it will cut

---

significance of the other factors that effect the cost of capital, agency costs and bankruptcy costs, is, at least for small changes in debt equity ratios by companies that are not close to bankruptcy, not clearly established. See also Myers, The Search for the Optimal Capital Structure, 1 Midland Corp. Fin. J. 6 (1983).

[64] Companies might, however, be reluctant to cut dividends as that would signal that the stock price is undervalued. Pettit, Dividend Announcements, Security Performance and Capital Market Efficiency, 27 J. Fin. 993 (1972); Kwan, Efficient Market Tests of the Informational Content of Dividend Announcements: Critique and Extension, 16 J. Financial & Quan. Analysis. 193 (1981). But see Kalay, Signaling Information Content, and the Reluctance to Cut Dividends, 15 J. Financial & Quan. Analysis 855 (1980) (evidence on signalling hypothesis is inconclusive). See also Black & Scholes, The Effect of Dividend Yield and Dividend Policy on Common Stock Prices and Returns, 1 J. Financial Econ. 1, 5 (1974) (by explaining reasons for change in dividends, signalling effect could be reduced). On the other hand, dividend cuts might have favorable tax consequences. See Bierman & West, The Acquisition of Common Stock by the Corporate issuer, 21 J. Fin. 687 (1966); Elton & Gruber, The Effect of Share Repurchase on the Value of the Firm, 23 J. Fin. 135 (1968); Litzenberger & Ramaswamy, The Effect of Personal Taxes and Dividends on Capital Asset Prices: Theory and Empirical Evidence, 7 J. Financial Econ. 163 (1979).; but see Black & Scholes, The Effect of Dividend Yield and Dividend Policy on Common Stock Prices and Returns, 1 J. Financial Econ. 1 (1974) (finding that dividends do not affect cost of capital).

those that are the least profitable, the net gains from these projects would generally have been small. Moreover, companies frequently reissue the shares that are repurchased within a short period of time[65]. In that case, social losses would consist only of the net gains foregone during that period, i.e. of an even smaller amount.

Thus, it is of principal importance that stocks are correctly priced when they are originally issued[66]. The price at which stocks trade in the primary market directly affects investment and financing decisions. However, the price at which shares trade in the secondary market, when they are sold by one investor and bought by another investor, will generally not cause significant social losses[67]. Significant losses from mispricing in the

---

[65] See Austin, Treasury Stock Reacquisitions by American Companies 1961 -1967, Fin. Exec., May 1969 at 46 (57% of stocks repurchased between 1961 to 1967 were resold in same time period).

[66] Note that SEC Rule 415, 70 C.F.R. 230.415 permitting some companies to shelf register stock and sell them on short notice with little additional disclosure, might make it easier to exploit misvaluations. Several commentators have suggested to impose a two day waiting period before stocks can be sold under rule 415. See Gordon & Kornhauser, Efficient Markets, Costly Information and Securities Research, 60 N.Y.U. L.Rev. 761, 818-823 (1985); see also Banoff, Regulatory Subsidies, Efficient Markets, and Shelf Registration: An Analysis of Rule 415, 70 Va. L. Rev. 135, 158-160 (1984).

[67] Note that some commentators fail to distinguish stock market efficiency in the primary and secondary market and seem to imply that secondary market efficiency is of substantial significance for investment decisions. See e.g. Brudney, Insiders, Outsiders, and Informational Advantages under the Federal Securities Laws, 93 Harv. L. Rev. 322, 341

secondary market could result when a company makes a self tender offer; however such events are rare. Other trades in treasury shares will, as the amount of shares involved is small, tend not to cause significant losses.

Efficiency in the primary and efficiency in the secondary market are, of course, to some extent interconnected. For example, it would be unlikely that stocks are predictably underpriced in the market for original issues, but priced correctly in the aftermarket[68]. If that were the case, investors could rush to buy stocks at a discount when they are originally issued in order to sell them at a profit in the secondary market.

This, however, does not mean that both markets must be efficient to the same extent. Rather, it just means that it is unlikely that one market predictably over- or undervalues

---

(1979) ("The sooner [new information] is found, the more accurately it is appraised, and the more immediately it induces a purchase or sale, the more precisely will the market price of the securities correspond to the value of the enterprise. The market will thus function efficiently to allocate savings to enterprises which are more profitable and divert them form enterprises which are less profitable." (emphasis added); Carlton & Fischel, The Regulation of Insider Trading, 35 Stan. L. Rev. 857, 866 (1983) ("The social gains from efficient capital markets are well known. The more accurately prices reflect information, the better prices guide capital investment in the economy").

[68] Actually, one study of the original issue market has found that investors can systematically make abnormal profits by buying shares as they are originally issued and selling them soon afterwards. That study tries to explain this result by institutional features of the original issue market. See Ibbotson, Price Performance of Common Stock New Issues, 2 J. Financial Econ. 235 (1975).

stock by more than the other market. But it would still be possible that the secondary market randomly misvalues stock, e.g. on account of non-public information, while the original issue market does not, e.g. because more information is made public at original issue, or vice versa. In such cases, investors could not systematically gain by buying in one market and selling in the other. Moreover, several legal provisions are addressed only to the primary or the secondary market. For that reason as well, efficiency in these two market might differ. For inducing optimal investment and financing decisions, one should, however, be much more concerned about stock market efficiency in the primary market than about efficiency in the secondary market. Thus, even though the original issue market is much smaller than the secondary market[69], it is of much greater potential importance in influencing investment and financing decisions.

C. Stock Market Inefficiencies and Externalities

So far, the analysis has assumed that, absent misvaluation, a company would make socially optimal investment and financing decisions. In this Subsection, I will consider

---

[69] From 1981 to 1984, the average value of common stock newly issued was about $23 billion. Herbert Dougall & Jack Gaumnitz, Capital Markets and Institutions, (5th ed. 1986) at 226. The 1986 dollar volume of trades on the New York Stock Exchange alone was over $1,374 billion. N.Y. Stock Exchange Fact Book 1987 (1987).

whether the existence of other market imperfections, which would lead companies to make non-optimal decisions even if the stock market is efficient, require a modification in the analysis.

A company will generally try to maximize its own profits. Private profit maximization does, however, not always lead to socially optimal decisions. In particular, a company's investment and financing might create positive or negative externalities, i.e. it might benefit or hurt third parties. If such externalities are present, a misvaluation might actually increase social welfare. Assume, for example, that Sylvia Bobs's expanded computer factory pollutes a nearby river, and that these pollution costs exceed the profits from an expansion of the factory. Then, an undervaluation of Orange Inc.'s shares which leads Bobs to forego the expansion would be socially desirable.

Most externalities will, however, be unconnected with the misvaluation. That is, negative externalities will generally not be associated with undervaluation and positive externalities not with overvaluation. With respect to those inefficiencies, it is safe to assume that they lead to inferior investment and financing decisions.

There are, however, two externalities that are so pervasive that they warrant particular attention. First, the tax system distorts investment decisions. Optimally, a society should invest until the marginal return on

investments equal the marginal preference of present over future consumption. The tax system, however creates differential costs for consumption and investment. Most consumption expenditures are taxed immediately by a sales tax; and investment expenditures are taxed subsequently by income taxes on profits. For that reason, economy wide investment will not be at the socially optimal level. Thus, for instance, while a stock market that generally undervalues companies will lead to a lower level of investment[70], it is unclear whether will this causes social losses.

Secondly, the tax system treats debt and equity differently. Interest on debt constitutes a taxable loss to the company and a taxable gain to the debtholder. Dividends, however, cannot be deducted form the income of the corporation and are fully taxable to non-corporate shareholders as ordinary income. It is generally assumed that these tax differentials make it cheaper to raise debt rather than equity[71]. Thus, in an efficient market, a company would take on more debt and less equity than socially optimal. Therefore, an overvaluation might induce a

---

[70] See also Fischer & Merton, Macroeconomics and Finance: The Role of the Stock Market, in K. Brunner & A.H. Meltzer Essays on Macroeconomic Implications of Financial and Labor Markets and Political Processes (1984).

[71] Modigliani & Miller, Taxes and the Cost of Capital: A Correction, 53 Amer. Econ. Rev. 433 (1963) (increased debt can reduce tax liabilities).

company to employ a socially more desirable capital structure.

These distortions by the tax system create some doubts about whether certain economy wide misvaluations would cause social losses. However, most stock market inefficiencies will not affect all companies in the economy equally. For example, the stock market might undervalue companies with low price to earnings ratios, but overvalue companies with high price to earnings ratios. Such a misvaluation would lead companies with low p/e ratios to invest too little and to be more debt financed and companies with high p/e ratios to invest too much and to be more equity financed. In that case, social losses would always arise because the rate of return earned by the overvalued company on its investment is lower than the rate of return that could have been earned by the undervalued company. Thus, even with respect to the pervasive externalities caused by the tax system, stock price inefficiencies that have a differential impact on the cost of raising equity are almost certain to cause social losses.

III. The Supply Of Capital By Investors

In the previous Section, I have analyzed how stock price inefficiencies can influence the amount of capital demanded by firms and how these impacts can result in social losses. In this Section, focus will shift to the supply of

capital by investors. According to modern finance theory, investors will be concerned about two factors in buying securities: the expected return of the securities and their risk[72]. If the inefficiency affects the expected return and risk of the stock, it will also influence the supply of capital[73]. This Section will be divided into two Subsections. In the first Subsection, I will analyze when inefficiencies affect the expected return of stocks. In the second Subsection, I will consider risk[74].

A. Inefficiencies and Expected Return

As explained in the previous Section, misvaluations in the primary market can lead companies to make inferior investment and financing decisions[75]. As companies will make less profitable investment and financing decisions, they will earn lower profits than they would in an efficient market. Thus, if the market is inefficient, investors, the owners of the company, will expect to earn a lower rate of

---

[72] See e.g. Brealy & Myers, Principles of Corporate Finance (2nd ed. 1984) at 117-190.

[73] Gordon and Kornhauser seem to have such effects in mind when they define speculative efficiency. Gordon & Kornhauser, Efficient Markets, Costly Information and Securities Research, 60 N.Y.U. L.Rev. 761, 768-769 (1985).

[74] Risk refers to its economic meaning, i.e. the variance in expected returns.

[75] The analysis of the primary market will, for the most part, follow Myers & Majluf, Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have, 13 J. Fin. Econ. 187 (1984).

return on their investments.

Investors, however, will respond to this expectation by lowering the price they are willing to pay for shares when they are originally issued[76]. That way, they will try to increase their expected return. This reduction in price will further affect the demand for equity, which will in turn affect the supply of equity capital, and so on. In equilibrium, most primary market inefficiencies will result in fewer equity offerings, more debt offerings and lower rates of return; some companies for which offerings are made will be overvalued, while others will be undervalued[77].

However, as explained in the previous Section, mispricing in the secondary market will not cause significant losses through inferior investment and financing decisions. Thus, unlike mispricing in the primary market, mispricing in the secondary market will not significantly lower the return to investors as a group. To see this,

---

[76] In particular, investors will interpret a decision by a company to issue equity as bad news as it makes it likelier that the company is overvalued. Empirical evidence showing stock price declines when new stocks are issued are consistent with this hypothesis. See Smith, Investment Banking and the Capital Acquisition Process, 15 J. Fin. Econ. 3 (1986).

[77] These results follow only if investors are rational in their reaction to the inefficiency. As investors will lower the price they are willing to pay, the number of equity offerings should decrease. However, unless the supply of equity capital is completely inelastic, rates of return will also fall. Lastly, in equilibrium, it is necessary that companies, on average, are valued correctly. Thus, if some companies are overvalued, others must be undervalued.

consider the case where the mispricing does not affect a company's investment and financing decisions. To be sure, an investor who sells an underpriced stock would earn a lower return than in an efficient market. However, the investor who buys that stock will earn a higher return. Thus, both investors as a group will earn the same return as in an efficient market.

One particular form of market inefficiency in the secondary market is, however, likely to lower the expected return to some investors. This will be the case if stock markets do not reflect non-public information. Those investors who do not possess non-public information will expect to earn a lower rate of return[78].

Asymmetric information will, however, affect investors only to the extent to which they trade stocks[79]; i.e. investors who every month buy and sell stocks will be more

---

[78] Also note that companies have strong incentives to provide information in the primary market. As asymmetric information will lead to an increase in the cost of capital. Companies would also have incentives to promise to provide information in the secondary market. However, companies might have difficulty to commit themselves credibly to provide such information in the future. Mandatory disclosure in the secondary market might provide a way to make such a commitment.

[79] See e.g. Carlton & Fischel, The Regulation of Insider Trading, 35 Stan. L. Rev. 857, 879 (1983); Brudney, Insiders, Outsiders, and Informational Advantages under the Federal Securities Laws, 93 Harv. L. Rev. 322, 356 (1979); Schotland, Unsafe at any Price: A Reply to Manne, 53 Va. L. Rev. 1425, 1441 (1967). Note that in the primary market, all investors, by definition, trade once and once only: when they buy the shares from the issuer.

affected than investors who maintain their portfolio. In the extreme case, an investor who never sold his stock would not at all be affected by an inefficiency in the secondary market. Such an investor will receive his dividends and liquidation premia just as if the secondary market were efficient.

That investors lose only by trading their stock has important implications. Investors who expect to lose from trading their stock will be less willing to trade[80]. If investors decide to trade less, a different cost will be imposed on society[81]. These costs consist of the welfare losses that result from a decline in liquidity[82]. Assume, for example an investor wanted to change his investment from low risk, low return to high risk, high return stocks. In an

---

[80] See Brudney, Insiders, Outsiders, and Informational Advantages under the Federal Securities Laws, 93 Harv. L. Rev. 322, 356 (1979); Schotland, Unsafe at any Price: A Reply to Manne, 53 Va. L. Rev. 1425, 1441 (1967); Carlton & Fischel, The Regulation of Insider Trading, 35 Stan. L. Rev. 857, 879 (1983).

[81] These costs, as well, would be born by the company in form of higher costs of raising equity. Cf. Brudney, Insiders, Outsiders, and Informational Advantages under the Federal Securities Laws, 93 Harv. L. Rev. 322, 356 (1979). However, social losses will consist of liquidity costs. As these liquidity costs are part of the social cost of raising capital, it is desirable for companies to modify their investment and financing decisions.

[82] See Brudney, Insiders, Outsiders, and Informational Advantages under the Federal Securities Laws, 93 Harv. L. Rev. 322, 356 (1979); Schotland, Unsafe at any Price: A Reply to Manne, 53 Va. L. Rev. 1425, 1441 (1967); Carlton & Fischel, The Regulation of Insider Trading, 35 Stan. L. Rev. 857, 879 (1983).

inefficient market, the investor might decide to stick with his undesired portfolio because of the expected losses from selling his stocks and buying new ones. He would only adjust his portfolio if his benefits are higher than the expected losses from trading.

Moreover, liquidity costs can create externalities by making the whole stock market less liquid[83]. If uninformed investors refuse to trade, even investors who do not fear to lose from trading might be unable to sell stocks without creating downward price pressure. Thus, the fewer investors are willing to trade, the thinner is the market, and the lower the liquidity for those who want to trade.

Now consider the case where investors nevertheless continue to trade. These trades, by themselves, create no social losses. They merely result in wealth transfers from uninformed to informed investors. But social losses would result if investors, when they buy shares in the primary market, expect to be uninformed when they want to sell these shares in the secondary market. In that case, companies will face a higher cost of raising equity to compensate the investors for the expected trading losses[84]. This higher

---

[83] Cf. Carlton & Fischel, The Regulation of Insider Trading, 35 Stan. L. Rev. 857, 879 (1983); Schotland, Unsafe at any Price: A Reply to Manne, 53 Va. L. Rev. 1425, 1441 (1967).

[84] See e.g. Brudney, Insiders, Outsiders, and Informational Advantages under the Federal Securities Laws, 93 Harv. L. Rev. 322, 356 (1979); Mendelson, The Economics of Insider Trading Reconsidered, 117 U. Pa. L. Rev. 470, 477 (1969).

cost of raising equity is undesirable because it can lead to inferior investment and financing decisions.

One should also note that the liquidity costs to investors are, in their entirety, social losses. The expected losses from trading, however, consist to a large degree of wealth transfers to informed traders. Social losses result only indirectly if they raise the cost of capital to the company and thereby affect investment and financing decisions. For that reason, liquidity costs cause potentially much larger losses to society than expected trading losses.

At last, it is important to realize that none of these losses result from the mere existence of asymmetric information. Rather, asymmetric information will cause losses only if the investors who have non-public information are permitted to trade on it. Insider trading laws, of course, restrict the ability to trade on non-public information and thus reduce these losses.

Thus, to summarize, any mispricing in the primary market will lower the expected rate of return to investors since it will cause inferior investment and financing decisions. As a result, companies will receive less when they offer shares to the public, which might further distort investment and financing decisions. On the other hand, inefficiencies in the secondary market are of significance only if they cause expected trading losses. This will be the

case where stock prices do not reflect non-public information and some investors trade on that information. Social losses will consist of liquidity costs and, if trading losses are anticipated when the stock is issued, from further distortions in investment and financing decisions.

B. Inefficiency and Risk

Another reason why investors might be concerned about stock market inefficiency is that the inefficiency creates risk. Investors, however, will only care about systematic risk, i.e. risk that cannot be diversified by buying a portfolio of stocks[85]. For stock market inefficiencies to create systematic risk, the mispricing must have several features: first, it may not last over the investor's investment horizon; second, the changes in the mispricing of stocks must be correlated with each other; and third, the changes in the mispricing must either be relatively large or must be correlated with the changes in the stock market[86]. There is only one kind of stock market inefficiency that is likely to meet these conditions. If stock prices are generally overpriced during booms and underpriced during recessions,

---

[85] Brealey & Myers, Principles of Corporate Finance, at 117. Sharpe, Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk, 19 J. Fin. 425 (1964).

[86] Otherwise the variance of stock prices would not increase significantly.

the mispricing would create systematic risk[87].

A stock market inefficiency that creates systematic risk might also have negative macroeconomic effects. Stock prices that are too low during recessions might lead companies to raise even less equity and to further decrease investments. Moreover, private consumption also depends on wealth[88]. Therefore, declines in stock prices could also cause decreases in consumption[89]. As a result, a recession might be aggravated and prolonged. Similarly, stock prices that rise too high during booms might increase inflationary pressures.

IV. The Market For Corporate Control

Sections II and III have analyzed demand and supply in

---

[87] But see Lorie, Insider Trading, Rule 10b-5, Disclosure, and Corporate Privacy: A Comment, 9 J. Legal Stud. 819 (1980) (claiming that insider trading would increase risk); Hazen, Rumor Control and Disclosure of Merger negotiations or Other Control Related Transactions: Full Disclosure or "No Comment" -- The Only Safe Harbors, 46 Maryland L. Rev. 954, 973 (1987) (non-disclosure of merger negotiations increases stock volatility). It is unclear whether these authors believe that these activities create non-diversifiable risk or whether they regard even diversifiable risk as negative.

[88] For the connection between wealth and consumption, see generally Andrew Abel (ed.), The Collected Papers of Franco Modigliani, vol. 2:The Life Cycle Hypothesis of Saving (1980).

[89] For studies on the wealth effect on consumption of stock price changes see Bosworth, Stock Market and Economy, 2 Brookings Papers on Economic Activity 253 (1975); Arena, Postwar Stock Market Changes and Consumer Spending, 47 Rev. Econ & Statistics 379 (1969) (both studies finding predicted effects, but they are not always statistically significant).

the market for capital. In this Section, the focus will shift to the market for control. Ordinarily, the value of the company does not depend on who owns its shares. This is however not the case where share ownership affects the control of a corporation. If control of a company changes[90], management might make different decisions or synergies might be created or destroyed. Thus, a change in control can affect the value of the company[91]. In that case, it is socially desirable to have those investors own the shares under which the value of the company is highest[92]. Stock market efficiency is significant in as much as it affects the market for corporate control[93].

---

[90] For purposes of this Section, changes in control will also encompass management buyouts, where the managers acquire the company from the public shareholders.

[91] Empirical studies show significant price changes when control changes. See e.g. Dodd & Ruback, Tender Offers and Stockholder Returns: An Empirical Analysis, 5 J. Financial Econ. 351 (1977); Dodd, Merger Proposals, Management Discretion, and Stockholder Wealth, 8 J. Financial Econ. 105 (1980).

[92] But see Shleifer & Summers, Breach of Trust in Hostile Takeovers, in Alan Auerbach (ed.), Corporate Takeovers: Causes and Consequences (1988) (takeover gains to shareholders might consist of wealth transfers from other groups).

[93] A non-functioning market for corporate control would also have consequences on managerial incentives. The threat of a takeover is generally assumed to contribute to managerial incentives to maximize shareholder wealth. The less related the chances of a takeover are to management performance, the fewer the incentives created by such a threat. See Manne, Mergers and the Market for Corporate Control, 73 J. Pol. Econ. 110 (1965); Scharfstein, The Disciplinary Role of Takeovers, 55 Rev. Econ. Stud. 185 (1988).

In order to provide optimal incentives to acquirers to induce only changes in control that increase the value of the company, they should be able to acquire the company at a price that reflects the value of the company under present control[94]. One should, however, also provide incentives to target companies to search for acquirers who can increase the value of the company and to create opportunities for acquirers to increase the value of the company[95]. Depending on the relative significance of these incentives, the optimal price for acquirers to obtain control will lie somewhere between the value of the company under present control and the value under the control of the acquirer[96].

---

[94] Including the probability, under present control, that a change in control will occur.

[95] Bebchuk, The Sole Owner Standard for Takeover Policy, 17 J. Legal Stud. 197 (1988). Such actions encompass the initial investment in companies that might be taken over, hiring investment bankers to find potential acquirers, provide for corporate charters that do not inhibit value increasing takeovers, providing information to potential acquirers, not exploiting investment opportunities that would be better exploited after a value increasing change in control, and so on.

[96] Determining the optimal price is quite complex. Assume acquirers and target actions are exclusive, i.e. only actions by acquirers or targets (but not by both) induce value increasing takeovers. Then acquirers should receive all gains from the takeover if it was their action that led to it, and vice versa. But assume the gains from the takeover must be divided independently of whose action led to it, e.g. 50%/50%. Then to provide optimal incentives, the stock price before the takeover would have to be below the value of the company under present control by an amount equal to the gains from the change in control. This, obviously, would not be the case in an efficient market.

Matters get even more complicated if acquirer and target actions are complementary, i.e. if an action by both

In perfectly efficient markets in which the share price reflects the expected value of the company, acquirers will not be able to make any profits by obtaining control[97]. In such markets, an acquirer would not be able to buy any shares at a price[98] that does not already reflect the full increase in the value of the company due to an expected change in control[99]. Thus, a perfectly efficient market

---

the acquirer and by the target is needed to induce a takeover. For example, targets might have to make the initial investment in the company and acquirer might have to find appropriate target companies. Then, to provide optimal incentives, the stock price gains must equal the takeover gains, i.e. the pre-takeover stock price must be the value under present control; and the gains must be divided in a way to create optimal incentives to both acquirers and targets to take the appropriate action.

But after one of the parties has taken the action, e.g. after the target has made the initial investment in the company to be taken over, actions might become exclusive, e.g. only acquirers can find the target. Then, optimal incentives will be created if the acquirer receives all the gains. Evidently, incentives cannot be optimal both before one party has taken the action and afterwards.

[97] See also Grossman & Hart, Takeover Bids, the Free Rider Problem, and the Theory of the Corporation, 11 Bell J. of Econ. 42 (1980).

[98] In such markets, there might be no equilibrium share price. I.e. if the share price is below $125, it will pay Bickens to attempt to acquire control; if it is $125, Bickens will not try to acquire control, and thus the price should drop to $100. This argument ties in with the general argument that perfectly efficient share markets are theoretically impossible. Grossman & Stiglitz, On the Impossibility of Informationally Efficient Markets, 70 Amer. Econ. Rev. 393 (1980). However, the general conclusion still remains that the more stock prices reflect attempts to change control of a company, the less profits can acquirers make, the lower will be their incentives to induce such changes.

[99] Acquirers would benefit from a change in control only if they had shares of the company before they tried to gain control or if they can use control to divert value from

would not create any incentives to acquirers to induce changes in control.

Assume, however, that the share price does not fully reflect attempts to take control, i.e. that an acquirer can buy some shares before the stock price moves up to reflect the attempt to take control. In such markets, the acquirers could get control at a price between the value of the company under existing control and its value under his control. Such markets would provide some incentives to acquirers to induce value increasing changes in control[100], some incentives to target companies to search and create opportunities for value increases[101], and correct incentives not to induce changes in control that decrease company value[102].

---

the non-controlling shareholders. Grossman & Hart, Takeover Bids, the Free Rider Problem, and the Theory of the Corporation, 11 Bell J. of Econ. 42 (1980); Shleifer & Vishny, Large Shareholders and Corporate Control, 94 J. Pol. Econ. 461 (1986).

[100] Cf. Fischel, Efficient Capital Market Theory, the Market for Corporate Control, and the Regulation of Tender Offers, 57 Tex. L. Rev. 1 (1978).

[101] Except by coincidence, these incentives would not be optimal, but they would be superior to incentives created by share prices outside the bound between value under present control and under acquires control. Note that an efficient market would make it easier to devise a legal framework on takeovers that creates optimal incentives.

[102] This assumes that acquirers are not able to divert value from minority shareholders. If acquirers can divert value, there might be incentives to induce value decreasing changes in control. Assume that the value under existing management is $100 million; under the acquirer $90 million; that the acquirer can divert $20 million of these $90

Assume, for example, that the value of Mountain under the control of P. Toone Bickens is $150 million. P. Toone can acquire 50% of Mountain stock at $100, i.e. before the stock price reflects his attempt to take control, and the other 50% at $150 per share. Then he would have to pay $125 million for Mountain. His gain would be $25 million, Mountain's gain would be $25 million, providing incentives to both sides to induce this change in control.

Compare such a case with stock markets that also otherwise misvalue shares. If the share price is otherwise overvalued, the stock price gains from value increasing changes in control will be less than the actual increase in value. Thereby, both acquirers and targets will have fewer incentives to induce value increasing changes in control[103].

---

million to himself; and that he needs 50% of the shares to obtain control. Assuming the stock price does not reflect the control attempt, his cost for buying the shares will be $50 million; but the value of these shares to the acquirer will be $55 million: $20 million in diversion and $35 million in share value. Thus, if diversion is possible, there will be incentives to engage in value decreasing control changes. However, if the stock price reflected to effects of the change in control, incentives would be even inferior. The acquirer would have to spend less than $50 million to obtain control as the share price will drop in anticipation of the possibility that the shares, after a change in control, would be worth only $70.

[103] As pointed out above, acquirers will have incentives to induce even value decreasing changes in control if they can divert value from minority shareholders. This, however, does not mean that it would be preferable to have companies overvalued in order to discourage such control changes. That would only be the case if the following conditions were met: control by acquirers who divert value from minority shareholders tends to reduce company value (including gains from diversion); changes in

Assume, for example, the stock value of Mountain is $120 million. If Bickens takes control, there will be a $50 million increase in value, but only a $30 million increase over the stock price. Assume that Bickens can buy all of Mountain stock at a price of $135 million, half way between the stock price and the value under his control. If it costs Bickens say $20 million to induce the change in control, he will no longer be interested in the deal. Similarly, assume that it would cost Mountain Corp. $20 million to search for an acquirers like Bickens that could increase Mountain's value to $150 million and that the stock price gains from such an acquisition must be split equally with such an acquirer. Mountain would undertake such a search if it were priced correctly; but it would not be willing to search if the stock price gains were only $30 million.

Now consider the case where the share price is undervalued. Obviously, in that case, some undesirable changes in control might occur. Assume, for example, that the share price of Valley Inc. is only $80. It might pay Bickens to acquire Valley Inc. if its value under his control is $90 million, even though, under present control, its true value is $100 million.

However, an undervalued stock price might, in some

---

control inspired by diversion are important relative to changes in control inspired by increases in company value; and acquirers are be better equipped to divert value than existing management.

cases, provide superior incentives to induce value increasing changes in control. Assume the value of Valley to Bickens is $130 million and his cost of affecting a takeover is $20 million. If the gains over Valley's pre-takeover stock price are divided equally, Bickens would not have an incentive to acquire Valley if its stock value were $100 million, i.e. its true value, but would have an incentive if its stock value were $80 million, i.e. if Valley were undervalued.

It should be noted, however, that not all kinds of stock market inefficiencies will have these effects. First, the same factor that is responsible for the market misvaluation might also be responsible for an equivalent misvaluation by the potential acquirers. Then the acquirers will face the same incentives with respect to changes in control as he would if both his estimate and the stock price were unbiased. For example, the market could misvalue Valley Inc. because it is not aware that a gold mine has been found under its headquarters. With the gold mine, the true value of Valley is $100 million; without it, it would be $80 million. Bickens is also not aware of the existence of the gold mine. If he knew about it, he would revise his estimate of the value of Valley under his control from $90 million to $110 million. In such a case, Bickens would face the same incentives to induce a change in control as where both the stock price of Valley and his estimate of Valley's value

under his control were accurate. To the contrary, if Valley were valued correctly at $100 per share, but Bickens did not know about the gold mine, he would not face correct incentives. He would believe to lose $10 million by taking control of Valley, while in fact his control would increase its value by $10 million.

Nor is it likely that many value decreasing takeovers occur because the acquirers possesses non-public information[104]. Such takeovers should occur only if two conditions are met. First, the information must be expected to stay non-public until the change in control is effected. Otherwise the acquirers would stop buying more shares when the information is revealed, i.e. before control has changed[105]. In hostile takeover attempts, this implies that incumbent management cannot credibly disclose that information[106]. Second, the acquirers must have some reason to believe that company value would improve under different management. Otherwise, he would just buy shares of the

---

[104] See also Bradley, Desai & Kim, The Rationale Behind Interfirm Tender Offers, 11 J. Financial Econ. 183 (1983) (post tender stock price movements show that takeovers are not motivated by non-public information).

[105] Another possibility is that the acquirers, at that point, has access to different non-public information. If that information is positive, he will continue to acquire control.

[106] In management buyouts, however, managers of course have no interest in releasing the information. But note the special disclosure requirements in going private transactions. 17 C.F.R. 240.13e-3.

undervalued company, but not change management[107].

Share price misvaluation can, however, lead to value decreasing takeovers inspired by innocent motives. For example, if Bickens only knew the share price and the actual value of Valley under his control, and the company is undervalued, he might decide to attempt a takeover. As Bickens does not know that Valley is undervalued because of non-public information that he possesses, he is more likely to change management policy[108]. Therefore, it would be desirable that potential acquirers have accurate information about the target before they induce changes in control[109].

In summary it can be said that a perfectly efficient market, where the share price accurately reflects the possibility of a takeover, will not create desirable incentives with respect to changes in control. A market where the share price does not immediately reflect takeover attempts will create superior incentives. Both acquirers and targets will have incentives to induce value increasing

---

[107] Kraakman, Taking Discounts Seriously: The Implications of "Discounted" Share Prices as an Acquisition Motive, 88 Col. L. Rev. 891, 939 (1988).

[108] Kraakman, Taking Discounts Seriously: The Implications of "Discounted" Share Prices as an Acquisition Motive, 88 Col. L. Rev. 891, 940 (1988).

[109] Cf. Coffee, Market Failure and the Economic Case for a Mandatory Disclosure System, 70 Va. L. Rev. 717, 741-743 (1984) (disclosure especially important in corporate control transactions); Dennis, Mandatory Disclosure Theory and Management Projections: A Law and Economics Perspective, 46 Maryland L. Rev. 1197, 1219 (1987) (arguing for expanded target disclosure in corporate control transactions).

takeovers, but not value decreasing takeovers. If stocks are overvalued, incentives to induce value increasing changes in control decline; if the stock price is undervalued, there will be some incentives to induce value decreasing changes in control, but incentives to induce value increasing changes might improve.

But not all kinds of stock market inefficiencies will have a negative impact on incentives. In particular, where the stock market misvaluation merely mirrors a misvaluation by the acquirers, incentives will not be affected. Furthermore, non-public information will only inspire takeovers if the information is expected not to become public before the takeover is completed and the acquirer believes that a change in management would increase company value. In other contexts, however, stock market inefficiencies would distort incentives with respect to changes in control.

V. The Informational Content Of Stock Prices

Besides influencing the actual buying and selling decisions, stock prices contain important information. In this Section, I will focus on three potentially important decisions that might be made on the basis of that information. In each instance, I will consider which stock market inefficiencies affect the informational content of stock prices in a way that is likely to cause social

losses[110]. I will first look at the connection between stock prices and capital budgeting decisions. Then, I will analyze how misvaluation affects the evaluation and compensation of managers. At last, I will deal with stock price oriented management behavior[111].

A. Capital Budgeting Decisions

Stock prices might have an impact on capital budgeting decisions by companies. In its capital budgeting decisions, the company decides which projects to invest in. In this Subsection, I will consider whether stock market inefficiencies can lead to inferior capital budgeting decisions.

Companies use a variety of capital budgeting techniques, the most important of which are payback rules, accounting rates of return, internal rates of return and net present

---

[110] The potential for losses resulting from the informational content of asset prices has been recognized before. See e.g. Stein, Informational Externalities and Welfare Reducing Speculation, 95 J. Pol. Econ. 1125 (1987).

[111] Stock prices can have a variety of other informational effects. Courts might use stock prices in order to base their damage awards on them; managers might use stock price reactions to announcements of new investments to evaluate their policy; economists might use stock prices for economic forecasts; etc. In all these issues, some forms of stock market inefficiency will reduce the usefulness of stock prices in decision making. As it would be tedious to analyze all of them one by one, this section will focus on only the three mentioned. The interested reader is invited to analyze the rest by himself.

values[112]. Under a payback rule, companies will make an investment if the initial outlays are recovered within some specified cutoff period[113]. A company using accounting rates of return would invest in projects whose average book rate of return exceeds a certain threshold rate[114]. The internal rate of return is the discount rate at which the cash flows of a project are valued at 0; investments will be undertaken if that rate is higher than the company hurdle rate[115]. Net present value is the discounted value of the project's cash flows; companies will invest if that value is positive[116]

Thus, under the last three of these techniques, companies will have to determine not only cash flows expected to result from a project but also a discount or hurdle rate. The most commonly used method for determining the discount rate is based on the capital asset pricing model[117]. A company employing this method would have to use

---

[112] See Schall, Sundem & Geijsbeck, Survey and Analysis of Capital Budgeting Methods, 33 J. Fin. 281 (1978).

[113] See e.g. Brealy & Myers, Principles of Corporate Finance (2nd ed. 1984) at 66-68.

[114] See e.g. Brealy & Myers, Principles of Corporate Finance (2nd ed. 1984) at 68-70.

[115] See e.g. Brealy & Myers, Principles of Corporate Finance (2nd ed. 1984) at 70-78.

[116] See e.g. Brealy & Myers, Principles of Corporate Finance (2nd ed. 1984) at 10-22.

[117] Information from Stewart Myers, Professor, Sloan School of Management; see also Schall, Sundem & Geijsbeck, Survey and Analysis of Capital Budgeting Methods, 33 J. Fin. 281, 283 (1978) (showing a large number of companies using

past data to estimate the covariance of its stock price and its debt price with the market portfolio. These figures, called Betas, are measures of the riskiness of its securities. Using Betas, the company would estimate the required rate of return on its equity and debt. Weighing these rates of return by the percentage of company value held by the equityholders and debtholders, the company would determine the discount or hurdle rate[118].

Stock prices thus enter the equation at two points. First, the company's stock price is used to calculate Beta, the covariance of past movements of the stock price with the market portfolio. Second, the stock price can be used in weighing the required rates of return on equity and debt. If stock market inefficiencies have an impact on either of these measures, they will influence the determination of the discount rate and thus the company's budgeting decisions.

Stock market inefficiencies are unlikely to have a significant effect on the calculation of past Betas. Such an effect would result in the inefficiency itself were correlated with the market, i.e. if stock prices become more overvalued when the market moves up or more undervalued when

---

weighted average cost of capital or risk adjusted rates).

[118] See e.g. Brealy & Myers, Principles of Corporate Finance (2nd ed. 1984) at 164-187.

the market moves down[119]. However, most alleged inefficiencies are independent of market movements. The only inefficiency for which this is not the case is when stock prices exaggerate the boom/ bust cycle. But if the whole stock market is subject to this form of mispricing, then the value of Beta will not be affected. Assume, for example, the stock price of Mountain Corp. moved up by twice as much as it would in an efficient market; if the market portfolio as well increased by double the percentage, the covariance of Mountain stock with the market will be the same as in an efficient market.

The second instance where stock prices can have an impact on the discount rate is the weighing of the rates of return of equity and debt. The stock price could be used to determine the market value of the equity and thus the weight given to its rate of return. Assume, for example, that Mountain's required rate of return on equity is 20% and of debt is 10%. Further assume the market value of its debt is $50 million. If the value of its stock is $50 million as well, it should use a discount rate of 15%. If, because its stock is overvalued, its value is $60 million, it would use instead a rate of 15.4%.

---

[119] If the inefficiency is not correlated to market movements, only inefficiencies that cause large changes in stock prices would be likely to lead to inaccurate measurements of Beta. This might come about if the stock price is influenced by significant noise trading, but would rarely result from other inefficiencies.

Companies, in general, do not often adjust their discount rates. Stable companies might change rates only every 3 to 4 years; and only in unusual cases would a company change its discount rate after less than 6 months[120]. Therefore, a company would not base the weight given to the rate of return on equity on the daily stock price. Rather, if, for instance, the used stock data from the past six months are used to calculate Beta, the company would use the average stock price over that period to determine the weight given to equity. Therefore, short term mispricings will have a negligeable effect on the calculation of the discount rate. On the other hand, inefficiencies that persist over long periods, for example if small companies are permanently underpriced, would have a impact on the discount rate. However, as the numerical example above shows, the quantitative impact of mispricing on the discount rate would still often be small.

Another commonly used technique to determine the required rate of return on equity is the discounted cash flow methodology[121]. In this technique, the company forecasts future dividends and calculates the discount rate at which these dividends would equal the stock price.

---

[120] Conversation with Stewart Myers, Professor of Finance, Sloan School of Management.

[121] See e.g. Siegel, The Application of the DCF Methodology for Determining the Cost of Equity Capital, Fin. Management, Spring 1985, at 46.

Assume, for example, that the company expects to pay dividends of $10 per year and expects dividends to grow at 5% annually. If the stock value is $100, the implicit discount rate would be 15%. However, if because of misvaluation, the stock price is $120, the required rate of return on equity would be estimated to be 12.33%. This rate, together with the rate on debt, would be used to calculate the discount rate.

Again, however, since companies will use average rather than daily stock prices to make these calculations, short term mispricings should not cause significant misestimates of the discount rate. Moreover, the future dividends that are used in the forecast should be the future dividends expected by the market. Thus, where the managers, for example because they have non-public information, know that their dividend estimates differ from those of the market, they should use the market's, and not their own estimates in determining the discount rate even if their own estimates are more accurate. Thus, if for some reason the managers are aware of a stock price misvaluation, the mispricing should, if handled correctly, not result in misestimates of the required rate of return on equity.

Whatever impact stock market inefficiencies have on discount rates, this impact must be viewed in relation to other problems with capital budgeting techniques. If, but for stock market inefficiencies, budgeting techniques were a

precise tool for making optimal investment decisions, the inefficiency would be more serious than if the techniques are highly inaccurate.

But capital budgeting techniques suffer from serious drawbacks. To mention just a few, the estimates of the cash flows to be discounted are highly speculative and often biased by managers who want "their" projects to be approved[122]. Under the accounting rate of return method, the wrong numbers, i.e. accounting flows rather than cash flows, are discounted[123]. Both the capital asset pricing and the discounted cash flow technique will give the same discount rate on all projects and for each time period. However, projects differ in their riskiness and discount rates can differ over time[124]. The capital asset pricing technique relies on the assumption that past Betas are a good estimate of the riskiness of future cash flows[125] and often makes arbitrary assumptions about the Beta of the company's debt[126]. And the discounted cash flow technique relies on

---

[122] See e.g Brealy & Myers, Principles of Corporate Finance, at 223-224 (2nd ed. 1984).

[123] Brealy & Myers, Principles of Corporate Finance, at 68-70 (2nd ed. 1984)

[124] Brealy & Myers, Principles of Corporate Finance, at 184-185 (2nd ed. 1984).

[125] Brealy & Myers, Principles of Corporate Finance, at 167-168 (2nd ed. 1984).

[126] Since bonds are not actively traded, it is difficult to determine their covariance with the market.

highly speculative forecasts of future dividends. Thus, possible stock market inefficiencies are certainly not the only reason, and probably one of the less serious reasons, why companies make incorrect capital budgeting decisions[127].

B. Compensation and Evaluation of Management

Important purposes of compensation and evaluation systems for managers is to create incentives to maximize shareholder wealth and to promote the most qualified managers[128]. Stock prices can serve an important function in these respects. Many managers own stock of the company[129] or are compensated in part with stock option plans or restricted stock

---

[127] Also note that the ratio of the market value of stocks to the replacement value of assets -- also known as Tobin's q -- has been shown to have a significant empirical relationship to investments. See e.g. Ciccolo, Money, Equity Values, and Income, 10 J. of Money, Credit & Banking 46 (1978) (relation between q and aggregate investment); Malkiel, von Fuerstenberg & Watson, Expectations, Tobin's q, and Industry Investment, 34 J. Fin. 549 (1979) (relation between industry q and industry investment). These results, however, could merely show that expectations of future profits influence both stock prices and investment decisions rather than that capital budgeting decisions are directly based on stock prices. See also Malkiel, von Fuerstenberg & Watson, Expectations, Tobin's q, and Industry Investment, 34 J. Fin. 549, 554 (1979) (using q as stand-in for future profit prospects).

[128] Jensen & Meckling, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, 3 J. Financial Econ. 305, 312 (1976).

[129] See also Demsetz, The Structure of Ownership and the Theory of the Firm, 26 J of L. & Econ. 375 (1983).

plans[130]. By making the amount of compensation dependent on the stock price, managers will have an incentive to maximize that stock price, which is usually in the interest of shareholders[131]. The stock price might also be used for the evaluation of managers. Whether the stock price declined or increased might be taken as an indication of management quality.

The usefulness of stock price related compensation and evaluation systems will depend on the correlation between stock prices and management effort and quality and on the quality of other measures of effort and quality. In efficient markets, stock prices are positively but not perfectly correlated with effort and quality. In addition to effort and quality of an individual manager, stock prices will move in response to exogenous factors, e.g. the general state of the economy, and to effort and quality of other managers.

Still it seems that stock prices can be effectively used to compensate and evaluate managers. Empirical evidence shows that at least stock ownership by management has

---

[130] Harland Fox, Top Executive Compensation: 1983 Edition, (1983) (27% of manufacturing companies have restricted stock plans, 80% have stock option plans).

[131] See Subsection C for instances where it might not be in the shareholder interest.

positive incentive effects[132]. Furthermore, the fact that stock price related compensation systems are in practice used as one important, although not exclusive[133], means of providing incentives constitutes additional evidence that there are no other dominant measures of effort. Empirical evidence also suggests the possibility that stock prices are used to evaluate management quality[134].

Inefficiencies in the stock market will reduce the

---

[132] See e.g. Morck, Shleifer & Vishny, Management Ownership and Market Valuation: An Empirical Analysis, 20 J. Financial Econ. 292 (1988); Stulz, Managerial Control of Voting Rights: Financial Policies and the Market for Corporate Control, 20 J. Financial Econ. 25 (1988); Harris & Raviv, Corporate Control Contests and Capital Structure, 20 J. Financial Econ. 55 (1988) (all three studies finding some empirical evidence that improved incentives resulting from higher stock ownership increase company value); Kaplan, Management Buyouts: Efficiency Gains or Value Transfers?, (Unpublished Manuscript, Harvard Business School) (increased profitability after MBO).

[133] Other important devices for creating incentives include bonus plans and long term performance plans. Harland Fox, Top Executive Compensation: 1983 Edition, (1983) (94% of manufacturing companies have bonus plan, 33% have long term performance plan). In these plans, compensation is tied to accounting profits or growth in earnings per share. Harland Fox, Top Executive Bonus Plans (1979); Bickford, Long-Term Incentives for Management, Part 6:Performance Attainment Plans, 13 Compensation Rev. 14 (3rd. Quarter 1981).

[134] Empirical studies show a correlation between stock prices and management tenure. Weisbach, Outside Directors and CEO Turnover, 20 J. Financial Econ. 431 (1988); Coughlan & Schmidt, Executive Compensation, Management Turnover, and Firm Performance: An Empirical Investigation, 7 J. Accounting & Econ. 43 (1985); Warner, Watts, Wruck, Stock Prices and Top Management Changes, 20 J. Financial Econ. 461 (1988). This, of course, does not necessarily mean that stock prices are used to evaluate management. Rather, both stock prices and management tenure might be correlated with other factors used to evaluate management.

value of share prices as indicators of effort and quality. The possibility of mispricing adds another source of noise which will tend to decrease the correlation between stock prices and management effort and quality[135].

Not all kinds of stock market inefficiencies will, however, seriously impair the usefulness of stock prices in compensating and evaluating management. First, only changes in mispricing, not the mispricing itself, decrease the correlation between stock prices and effort and quality. Assume, for example, that Valley Inc. is always underpriced by $100 million. Stock price related compensation and evaluation systems would be as effective in providing incentives to increase the value of Valley or in evaluating the performance of Valley management as when Valley stock were always priced correctly. For several kinds of stock market inefficiencies, for example if the stock market undervalues companies in general or undervalues small companies, the mispricing might tend to be relatively stable.

Second, only changes in mispricing that last beyond the manager's horizon will have a significant negative impact. If the changes in mispricing correct themselves within that horizon, incentives and evaluation decisions will not be

---

[135] Managers could also manipulate the stock price in order to increase their compensation and bias their evaluation. Such manipulation might be costly in itself. See infra, Section V.C.

affected. Assume, for example, that companies that change to the flow-through method of reporting income tax credits become overvalued for 5 months, but are valued correctly afterwards[136]. During these 5 months, management compensation and evaluation will initially be biased upwards (as the stock price increases above its true value) and then downward (as the stock price declines to its true value). Managers that expect to stay with the company for longer than 5 months will on the whole be compensated and evaluated in about the same way as if the stock price had always reflected the true value of the company.

Thirdly, if stock price changes due to mispricing are small relative to other stock price changes that are unrelated to quality and effort of the individual managers, the total noise added by these changes will be very small. Assume, for example, changes due to mispricing have a standard deviation of 1/5 of such other stock price changes. Then, the standard deviation of all stock price changes unrelated to management performance will increase by only about 1/50[137]. Thus, the mispricing would only reduce the correlation between effort and quality and stock prices by a minimal amount.

---

[136] Kaplan & Roll, Investor Evaluation of Accounting Information Changes: Some Empirical Evidence, 45 J. Bus. 225 (1972).

[137] Assuming that change in mispricing is uncorrelated to management effort and quality and to changes in stock prices for other reasons.

But several kinds of stock market inefficiencies could seriously impair the usefulness of stock price based compensation and evaluation systems. Assume, for example, that the stock market pays to much attention to short term profits and to little to long term profits. In such markets, managers who focus on the short term will receive a higher compensation and get promoted, while managers who try to maximize the true value of the company and focus on the long term will receive less and get fired.

C. Stock Price Oriented Behavior

In this Subsection, I will deal with stock price oriented behavior by managers. This behavior consists of management decisions that attempt to influence the stock price in a manner that is different from their effect on the value of the company. For example, it encompasses a decision to change accounting standards in order to increase reported earnings and the stock price. But it would also be stock price oriented to release new accurate information in order to influence the stock price or to signal the existence of positive information by increasing dividends.

For simplicity, I will assume that managers try to increase the stock price by actions that increase the stock price without increasing the value of the company[138]. In

---

[138] If managers are permitted to engage in insider trading, they might also find it in their interest to decrease the stock price. Carlton & Fischel, The Regulation

doing so, managers might want to make takeovers less likely, to increase their compensation and improve their evaluation, or to act in the perceived interest of the shareholders. The effect of mispricing on changes in control and on management incentives and evaluation has been analyzed before. In this Subsection, I will be concerned with another reason why such behavior is undesirable: the very act that is designed to increase the stock price might decrease the value of the company.

Obviously, if the market were efficient, there would be no room for stock price oriented behavior. But not all kinds of stock market inefficiencies permit managers to effectively engage in such quasi manipulation. Rather, an artificial increase in the stock price must last for the time horizon over which management wants to maximize the stock price. Thus, for example, if management released inaccurate information in order to increase the stock price, but has to correct such information within one week, management would hardly be benefited. Furthermore, not every act of quasi-manipulation will decrease the value of the company. For example, releasing positive information about quarterly earnings will ordinarily affect the stock price without reducing the value of the company.

Other kinds of stock market inefficiencies, however, create effective opportunities for stock price oriented

---

of Insider Trading, 35 Stan. L. Rev. 857, 873-875 (1983).

behavior which would decrease the value of the company. In particular, stock markets that are myopic or that generally undervalue companies might lead managers to take actions that increase the stock price but lower the value of the company. Assume, for example, that Valley management can invest in one of two projects. Project 1 is long term and will increase the value of Valley by $50 million; project 2 is short term and will increase the value by $10 million. However, because the stock market focuses on the short term, investing in project 1 will lead to higher stock price than investing in project 2. In such a case, managers might decide to maximize the stock price and invest in project 2. Society would have lost $40 million.

As another example, assume that Valley's value is $100 million, but that its share value is only $80 million. Valley management might decide to sell $75 million in Valley assets for $70 million in cash. If the remainder of Valley assets remains to be undervalued by 20%, its stock price would be $90 million. That way, Valley management would have increased the stock price by $10 million even though the value of Valley has declined by $5 million.

VI. Policy Analysis: Disclosure Of Merger Negotiations And Insider Trading

In this Section, I will apply the approach developed in this essay to two specific issues. I will first analyze

whether requiring companies to disclose ongoing merger negotiations, or requiring them not to misinform about such negotiations[139], enhances the efficiency of the market in a socially desirable way. Next, I will assume that insider trading conveys information to the market and analyze whether this is a reason to permit insider trading.

The conclusions reached by this analysis are not meant to be firm; to reach firm conclusions, one would have to undertake a detailed empirical study of the various effects described. The analysis is, however, meant to provide guidelines for the direction of such empirical research and to appeal to the reader's intuition about the significance of the various effects. To simplify the analysis, I will assume that the stock market is efficient except with respect to the kind of information analyzed and that insider trading laws, if they exist, are not violated.

A. Disclosure of Merger Negotiations

Requiring companies to disclose ongoing merger negotiations[140] provides the market with better information about the company's true value. To a lesser degree, requiring companies not to misinform about such

---

[139] See Basic v. Levinson, 108 S.Ct. 978 (1988) (company may not misinform about merger negotiations).

[140] Such disclosure is not required; Basic v. Levinson, 108 S.Ct. 978 (1988).

negotiations[141] has the same effect in conveying information to the market. As the market will have more accurate information, the stock price will better reflect the true value of the company, i.e. the market will be more efficient. Improved stock market efficiency has actually been proposed as one of the reasons why such disclosure should be required[142].

In evaluating the benefits of enhanced stock market efficiency, the first issue is whether the inefficiency caused by merger negotiations not being reflected in the stock price will distort the company's demand for capital. It will be recalled that such distortions result whenever a company issues shares or otherwise trades in a significant amount of its own shares. Non-disclosure of merger negotiations will, however, only affect the secondary market. While companies go public or issue new stock, they do generally not engage in secret merger negotiations. In any case, one could require disclosure of such negotiations when companies go public or issue new stock independently of requiring it for companies not engaged in such transactions.

---

[141] Companies are not permitted to misinform; Basic v. Levinson, 108 S.Ct. 978 (1988).

[142] See Hazen, Rumor Control and Disclosure of Merger negotiations or Other Control Related Transactions: Full Disclosure or "No Comment" -- The Only Safe Harbors, 46 Maryland L. Rev. 954, 955-959 (1987). For other arguments on requiring disclosure, see e.g. Note, Rule 10b-5 and the Duty to Disclose Merger Negotiations in Corporate Statements, 96 Yale L. J. 547 (1987); Note, Disclosure of Preliminary Merger Negotiations, 8 Cardozo L. Rev. 197 (1986).

But if no companies are engaged in secret negotiations when they issue stock, the shares will, at that point, not be mispriced on account of non-disclosure. Thus, with respect to the issue of new shares, the demand for capital is not distorted by non-disclosure of negotiations.

Mispricing is also unlikely to affect the demand for capital through self tender offers and trades in treasury shares. Knowledge of ongoing merger negotiations would often be considered material insider information[143], and companies would not be permitted to trade on it. Thus, during undisclosed merger negotiations, companies will not be permitted to make self tender offers or trade in treasury shares. Even if companies were permitted to trade, it would seem unlikely that they will engage in major recapitalization right before the merger. Thus, since a company will not engage in significant trades while their shares are mispriced, the mispricing will generally not distort the company's demand for capital.

The company's cost of capital might, however, be affected because the mispricing affects the supply of capital. If some investors trade on account of non-public information about merger negotiations, investors who do not possess that information will rationally expect to lose by trading. As a result, these investors will be reluctant to trade in the secondary market and suffer a corresponding

---

[143] See Basic v. Levinson, 108 S.Ct. 978 (1988).

decline in liquidity. To the extent to which investors continue to trade, companies will be forced to sell their shares at a lower price in order to make up for expected trading losses.

However, most investors having access to non-public information about merger negotiations would violate insider trading laws by using this information. Thus, if insider trading laws are not violated, the expected losses from trading would be minimal and should thus not cause a significant welfare losses. Also, the change in mispricing will be both uncorrelated among companies and uncorrelated with the change in the market. Thus, mispricing will not create any undiversifiable risk.

It is unlikely that non-disclosure of merger negotiations would have an adverse impact on the market for corporate control. Such an impact could, for instance, result if the shares are underpriced and some value decreasing takeovers occur[144]. However, if there is an attempt to have a value decreasing takeover, management would still have enough time to disclose the merger negotiations[145]. Thus, by an appropriate response, any value

---

[144] As merger announcements generally result in stock price increases, the dominant effects of not disclosing merger negotiations would be a stock undervaluation; see Dodd, Merger Proposals, Management Discretion, and Stockholder Wealth, 8 J. Financial Econ. 105 (1980).

[145] Requiring disclosure of negotiations might be desirable in order to alert other potential acquires to merger possibilities. Cf. Bebchuk, The Sole Owner Standard

decreasing takeovers that might be caused by an undervaluation can be avoided.

Consider now whether stock market inefficiencies affect the informational content of stock prices. This will, to a significant degree depend on the nature of the mispricing. The mispricing caused by undisclosed merger negotiations will be relatively short term as such negotiations are inevitably disclosed when the companies seek shareholder approval for the merger. Furthermore, the mispricing will not be correlated with changes in the market portfolio as merger negotiations are firm specific events. Lastly, since the managers will know of the negotiations, the will be aware that the shares of their company will be mispriced.

Non-disclosure of merger negotiations is thus unlikely to have a strong impact on capital budgeting decisions. As explained in Section V, such an impact could result if the mispricing affects the determination of the discount rate under the capital asset pricing technique or the discounted cash flow technique. But since the mispricing is short term and uncorrelated to the market, it should not greatly affect the calculation of the equity Beta, and thus of the discount rate, for companies using the capital asset pricing

---

for Takeover Policy, 17 J. Legal Stud. 197 (1988) (advocating auction rule for takeovers). Note, however, that this result would generally be achieved despite, and not because of, the correction in mispricing. Merger announcements generally result in stock price increases, making the company a less attractive target for acquisition.

technique. Companies using the discounted cash flow technique should not take the effects of the merger into account in making their dividend projections; thus, for those companies as well, the mispricing should not affect the estimate of the discount rate.

Stock prices are also used to compensate and evaluate management. It would, for instance, be undesirable if managers were compensated and evaluated on the basis of stock prices that do not take into account increases in company value due to an impending merger. But since the mispricing caused by non-disclosure of merger negotiation is short term, the time horizon of the managers will ordinarily last beyond the announcement of the merger; in other words, most managers will not care whether the stock price takes account of the merger during the secret negotiations or only when these negotiations are disclosed. Therefore, the mispricing on account of non-disclosure of merger negotiations should have few adverse consequences on management compensation and evaluation.

A last way in which social losses can arise due to the informational effects of stock prices is that managers maximize the stock price rather than company value. Such stock price oriented behavior could lead managers to disclose the merger negotiations; such disclosure might increase the stock price without increasing the company's true value. If such behavior is undesirable because

disclosure would reduce the company's value, e.g. because it might lead to a breakdown in the negotiations[146], requiring disclosure by law would a fortiori be undesirable. In any case, as the mispricing is short term, behavior designed to increase the stock price without increasing company value would not be effective.

In summary, then, while requiring companies to disclose merger negotiations or not to misinform about them would make stock markets more efficient, the kind of efficiency created is probably not of great social importance. The main reason for concern is that a select group of investors might trade on account of this non-public information and that the expectation of such trades would result in a decline in liquidity and an increase in the cost of equity. However, most of this concern is addressed by existing insider trading laws. Thus, the decision on whether and what disclosure requirements should exists with respect to merger negotiations should not be made on account of improvements in stock market efficiency.

B. Insider Trading

I will now turn to the second issue: whether permitting insider trading would create a kind of market efficiency that is socially desirable. The argument that insider

---

146 See Note, Rule 10b-5 and the Duty to Disclose Merger Negotiations in Corporate Statements, 96 Yale L. J. 547, 554-556 (1987).

trading makes markets more efficient is that the market will obtain information about the true value of the company by observing the trades of insiders[147]. There is also a contrary argument: that by permitting insider trading, insiders will have an incentive to disclose less information and that the market will therefore become less efficient[148]. To simplify the analysis, I will assume that the second effect does not occur, i.e. that insiders do not retain information just to make profits on insider trades. I will also not deal with the various other reasons why insider trading might be desirable or undesirable[149].

Whether the market efficiency created by insider trading is socially desirable will, to a large extent, depend on the kind of information that insiders trade on. Information differs in the way it can be credibly communicated to the market without decreasing company value[150] and in the time it would become public absent insider trading.

On one side on the spectrum is information that can be

---

147 Carlton & Fischel, The Regulation of Insider Trading, 35 Stan. L. Rev. 857, 868 (1983).

148 See e.g. Schotland, Unsafe at any Price: A Reply to Manne, 53 Va. L. Rev. 1425, 1441 (1967); Mendelson, The Economics of Insider trading Reconsidered, 117 U. Penn. L. Rev. 470, 489 (1969).

149 See generally Clark, Corporate Law, at 265-280 (1986).

150 See also Carlton & Fischel, The Regulation of Insider Trading, 35 Stan. L. Rev. 857, 868 (1983).

easily communicated or that would, absent insider trading, become public quickly. Information about ongoing merger negotiations often constitutes an example of such information. As the analysis of disclosure of merger negotiations showed, the main reason why such disclosure is socially desirable is to eliminate trading on non-public information. Permitting insider trading to have such information "disclosed" is therefore, in all likelihood, undesirable.

Other kinds of information, however, cannot be credibly disclosed and might, absent insider trading, not become public quickly. For example, insiders might know about progress on a major research project; but merely disclosing that progress has been made is not credible and disclosing details would provide information to competitors[151]. However, if insider trading were permitted, insider could signal the existence of say positive information by buying the stock of the company[152]. This way, the existence of positive information can be credibly disclosed without disclosing details.

Even with respect to those kinds of information, legalizing insider trading will not reduce social losses

---

[151] See also Myers & Majluf, Corporate Financing and Investment Decisions When Firms Have Information that Investors Do Not Have, 13 J. Fin. Econ. 187, 195 (1984)

[152] See Gilson & Kraakman, The Mechanisms of Market Efficiency, 70 Va. L. Rev. 549, 629-635 (1984).

that result from distortions in the demand for capital. As explained, insider trading makes the market more efficient because trades by insiders in the secondary market signal the existence of information. Thus, while insider trading might make the secondary market more efficient, it will not directly affect the primary market. It will be recalled, however, that efficiency in the primary market is of principal importance with respect to the demand for capital. The stock market efficiency created by permitting insider trading will have no bearing on the demand for capital in the primary market.

Mispricing in the secondary market can also distort the demand for capital if a company makes a self tender offer or trades in its treasury shares. But legalizing insider trading would also not decrease the opportunity of firms to exploit secondary market inefficiencies in these ways. Insider trading laws apply not only to insider managers but also to the corporation itself[153]. In other words, if insider trading is not permitted, the secondary market might be less efficient; but the corporation will not be permitted to use its insider information in order to make a self tender or to trade in treasury shares. Thus, legalizing insider trading will also not reduce distortions in the demand for capital that are rooted in the secondary market.

---

[153] See e.g. Staffin v. Greenberg, 672 F.2d 1196 (3rd Cir. 1982); Reiss v. Pan American World Airways, 711 F.2d 11 (2nd Cir. 1983).

Insider trading will, however, affect the supply of capital. Permitting insider trading will lead investors who do not possess insider information to expect to lose by trading in the secondary market. Thus it can lead to a reduction in liquidity and to an increased cost of capital to make up for the expected trading losses. In this respect, permitting insider trading will create social losses, rather than gains.

The amount of such losses will depend on how quickly and accurately the secondary market responds to trades by insiders. For example, if the market price adjusts to the trades by insiders within one hour, expected losses to non-insiders will be lower than in the market price adjusts within one weak. Thus, if insider trading is permitted, there are strong reasons to require insiders to disclose their trades[154]. But even a quick adjustment must let insiders make some profits on their trades; otherwise they will have no incentive to trade and, by implication, their trades will not disclose the existence of information. In other words, as long as insider trading signals the existence of information, non-insiders will expect to lose by trading, and social losses will result.

But note that the mispricing on account of insider information will be both uncorrelated among companies and

---

[154] Currently, some disclosure is required under Section 16(a) of the Securities Exchange Act of 1934.

uncorrelated with the market. Therefore, it will not change the riskiness of stocks.

Permitting insider can, however, have a beneficial impact on the market for control. As mentioned, some information cannot be credibly disclosed and does not become public quickly. Thus, the information might not be disclosed before the takeover is completed. This will probably lead to inferior incentives with respect to changes in control. On the other hand, this kind of insider information would often lead to an equivalent misvaluation by the acquirers. As noted, if the acquirer's misestimate to the value of the company under her control is equivalent to the market misvaluation, incentives will not be affected. Therefore, the potential for social losses will be limited to those cases where the information has a differential impact on the acquirer's estimate and the market valuation.

Permitting insider trading can also create social gains by improving the informational content of share prices. With respect to management compensation and evaluation, not permitting insider trading can dilute incentives to "develop" information that would not become public. In particular, this will be the case if the information will not become public over the manager's time horizon[155]. Also,

---

[155] These adverse effects can be ameliorated to the degree to which compensation and evaluation can be based as well on other factors that do take into account the inside information. Managers will often find ways to credibly disclose the information internally. As compensation and, to

stock price oriented behavior might lead managers to disclose positive information directly. This can, as in the example of the research breakthrough, increase the stock price even though it lowers the true value of the company. To the extent that management decides to disclose such information, such behavior can cause social losses; of course, if the information is disclosed, the stock will no longer be mispriced, and there will be no further adverse effects. But note that mispricing on account of non-public information should not influence capital budgeting decisions since the managers will know that the shares are mispriced and the mispricing will not be correlated to changes in the market portfolio.

On the whole, then, it is ambiguous whether the kind of efficiency enhanced by permitting insider trading is desirable. If the insider information could be credibly disclosed, permitting insider trading would lead to a reduction in liquidity and an increased cost of equity and probably has no significant positive effects. If the information could not be credibly disclosed without hurting the company, permitting insider trading would still involve these costs; but there would also be some benefits: the market for corporate control would, in some cases, be improved; compensation and evaluation systems would become

---

some extent, evaluation is internal to the company, it would be possible to take the inside information into account in making compensation and evaluation decisions.

more efficient; and losses from stock price oriented behavior might be avoided.

VI. Conclusion

This essay has tried to present the various reasons why different kinds of stock market inefficiencies might be undesirable. I have considered three ways in which inefficiencies can cause social losses. First, an inefficient stock price can lead to losses by affecting the demand for and the supply of capital. Second, it can have a negative impact on the market for control. And third, it can lead to inferior decisions that are based on the informational content of stock prices. However, whether losses actually result will depend on the nature of the inefficiency.

Mispricing in the primary market affects the demand for equity capital. Thereby, mispricing can lead to inferior investment and financing decisions. Companies that are undervalued might invest too little and use too much debt financing; companies that are overvalued might invest too much and use too much equity financing. Social losses will consist of the net gains that could have been earned on investments by undervalued companies and the net losses from investments by overvalued companies. In addition, losses will consist of increases in agency and bankruptcy costs that result from effects on the capital structure.

Mispricing in the secondary market can cause similar losses if companies engage in self tender offers. However, ordinary trades in treasury shares are unlikely to cause substantial losses.

Mispricing will also affect the supply of capital. As mispricing in the primary market will cause companies to make inferior investment and financing decisions, shareholders will offer a lower price for the shares. Also, asymmetric information in the secondary market, if expected at the time when a firm offers stock in the primary market, can also lead uninformed investors to pay less for shares. Social losses will result from the impact on investment and financing decisions. In addition, asymmetric information will impose liquidity costs. Such costs result when investors who expect to lose from trading decide not to engage in stock market transactions. Furthermore, if stock prices rise too high in bull markets and fall too low in bear markets, the inefficiency would increase the risk to investors and might have adverse macroeconomic consequences.

In the market for control, stock mispricing can lead to social losses by encouraging value reducing or discouraging value increasing changes in control. Overvaluation would always decrease incentives to induce only value increasing changes in control; undervaluation, if relatively small, might on occasion improve incentives. However, stock misvaluations will only have an impact on changes of control

if the acquirer's estimate of the value of the company under his control is not equally flawed. Moreover, potential acquirers will ordinarily not induce a change in control merely because they possess non-public information that is not reflected in the stock price.

Stock market inefficiencies can also cause social losses by influencing capital budgeting decision and management compensation and evaluation, and by causing stock price oriented behavior. Companies might use stock prices to determine their discount or hurdle rate for investment projects. For companies using the capital asset pricing technique, inefficiencies that lead to biased estimates of the riskiness of stocks are a special cause for concern. If the company uses the discounted cash flow technique, misvaluations of company value that are not shared by managers would be likely to affect the discount rate. Moreover, under both techniques, persistent misvaluations can influence the discount rate. These problems, however, have to be seen in relation to other sources of error inherent in capital budgeting decisions.

Inefficient stock prices can also have negative effects on compensation and evaluation schemes for managers. Neither very long term nor short term mispricing would, however, have a significant impact on the usefulness of these schemes. If the mispricing is very long term or short term, stock price changes over the tenure of the manager would

tend not to be affected by the inefficiency. Furthermore, if the mispricing is small relative to other effects on stock prices over which the manager has no control, compensation and evaluation systems would also tend to be unaffected.

Inefficient stock prices might also induce managers to maximize the stock price rather than the value of the company. To be effective, such behavior must increase the stock price over the desired time horizon. Social losses result to the extent to which such quasi-manipulative activities lower the value of the company. This might in particular be the case when stock markets are myopic and undervalue long range investments and when they generally undervalue companies.

The main implications of these results can thus be summarized as follows. First, the importance of efficient capital markets depend on when stocks are mispriced. In particular, efficient pricing of stock is important when stocks are originally sold to the public and when the company engages in self tender offers. In addition, efficient pricing is important when control of the company is about to change. Thus, laws aimed at making the market more efficient should focus on these time periods.

Second, different kinds of efficiencies are undesirable for different reasons. For example, small companies being permanently undervalued will not result increase the risk to investors while stock prices rising too high during bull

markets and falling too low during bear markets would. Or equivalent misvaluations by the stock market and by an acquirer will have no impact on the market for control.

However, the only kind of inefficiency that can be effectively addressed by the legal system is mispricing on account of non-public information. In particular, additional disclosure requirements could speed up the disclosure of information. But as the analysis in Section VI indicates, the improved stock market efficiency that would result from earlier disclosure of information would often not result in significant social benefits.