

RESEARCH REPORT

**SHARE BUY-BACKS: AN EMPIRICAL
INVESTIGATION**

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SHARE BUY-BACKS: AN EMPIRICAL INVESTIGATION

EXECUTIVE SUMMARY

Studies of share repurchases, or share buy-backs as they are referred to in Australia, have been an important part of financial research. In addition, there is increasing interest in the relationship between legal regulation and finance. In this Research Report, we combine these areas of research and examine the effects of the changing legal regulation of share buy-backs in Australia. Prior to 1989 Australian companies were prohibited from repurchasing their shares, and until 1995 they were heavily regulated with few companies repurchasing their shares. In December 1995 the legal regulation of share buy-backs was simplified making it considerably easier for companies to repurchase their shares. The changing Australian regulation of share buy-backs provides a unique opportunity to test the effects of legal regulation on companies' financing decisions. In particular, we examine whether the highly regulated environment for share buy-backs that existed during 1989-95 meant that companies were unable to undertake buy-backs for the purpose of information signalling. In the less regulated environment, which existed after 1995, we examine whether companies have been able to undertake buy-backs for the purpose of information signalling. Our results indicate that the stringent regulation of share buy-backs during 1989-95 made them less effective as a credible signalling mechanism. Further, we find that the market generally reacts the most positively to on-market buy-backs, while the reaction to other types of share buy-backs is positive but not statistically significant. Finally, we also find that the abnormal returns earned by resource sector companies announcing share buy-backs are generally higher than the abnormal returns earned by share buy-backs announced by companies in the industrial and financial services sectors.

SHARE BUY-BACKS: AN EMPIRICAL INVESTIGATION

I. INTRODUCTION

Studies of share buy-backs have been an important part of financial research. In addition, there is increasing interest in the relationship between legal regulation and finance.¹ In this Research Report, we combine these areas of research and examine the effects of the changing legal regulation of share buy-backs in Australia. As noted in Section II below, share buy-backs were prohibited in Australia until 1989. They were then heavily regulated until December 1995 and few companies repurchased their shares during this period. Subsequently, the law governing share buy-backs was substantially liberalized. The changing Australian legal regulation of buy-backs provides a unique opportunity to test the effects of legal regulation on companies' financing decisions. In particular, we examine whether the highly regulated environment for share buy-backs that existed during 1989-95 meant that companies were unable to undertake share buy-backs for the purpose of information signalling. In the less regulated environment, which existed after 1995, we hypothesize that companies have been able to undertake buy-backs for the purpose of information signalling.

The main research questions we address in this Research Report are: (a) have the substantial changes in the regulation of buy-backs affected companies' financing decisions, and (b) have the informational effects of buy-backs changed significantly as a result of the differences in legal regulation.

The next section outlines the changes that have occurred in the legal regulation of share buy-backs in Australia since 1989. Section III summarises reasons why companies undertake buy-backs. Section IV then provides an overview of the previous literature on share buy-backs. Section V provides details on the sample and method used and presents and discusses the results. Section 6 concludes the Report.

II. THE LEGAL REGULATION OF SHARE BUY-BACKS IN AUSTRALIA

Until 1989, Australian companies were prohibited from undertaking share buy-backs. In 1987 the Companies and Securities Law Review Committee published its report titled *A Company's Purchase of Its Own Shares* in which it recommended that the law be amended to allow share buy-backs. This occurred in 1989. However, the law could only be described as very rigid regulation of buy-backs consisting of 37 pages of legislation and 91 sections regulating share buy-backs. The regulation permitted five types of buy-backs with each type subject to different regulations. The five types of buy-backs allowed were:

- (i) *Equal access schemes applicable only to ordinary shares*: the company makes uniform offers to each shareholder to buy back a uniform percentage of each shareholder's ordinary shares.
- (ii) *On-market buy-backs*: a company listed on the Australian Stock Exchange buys its shares in the ordinary course of trading on the exchange in compliance with listing rules.

¹ R La Porta, F Lopez-de-Silanes, A Shleifer and R Vishny, 1997, "Legal Determinants of External Finance" (1997) 52 *Journal of Finance* 1131.

- (iii) *Minimum holding buy-backs*: a company listed on a securities exchange buys small parcels of shares which are not marketable parcels on the exchange.
- (iv) *Employee share scheme buy-backs*: a company buys shares held by, or for the benefit of, current or former employees under an existing employee share acquisition plan approved by shareholders.
- (v) *Selective buy-backs*: the company buys back from a particular shareholder, otherwise than in any of the above four ways.

Among the mandatory requirements imposed under this legislation were requirements including changes to the company's constitution before initiating buy-back programs, detailed disclosure requirements pertaining to the buy-back, imposition of stringent limits on the proportion of shares that could be repurchased, stringent shareholder approval requirements, etc. Further details on the main mandatory requirements are outlined in Appendix A.

These rigid requirements contrasted with the less regulated environment for buy-backs in the United States. State corporations statutes typically expressly empower companies to purchase their own shares with few restrictions.² The main restrictions are that when directors decide to undertake a buy-back, they must comply with their general fiduciary duties to act in the interests of the corporation and a buy-back must not result in insolvency, with the funds being used to buy the shares typically limited to surplus funds.³

It would seem that the effect of this detailed regulation, which imposed high transaction costs on companies wishing to undertake buy-backs, resulted in few buy-backs being undertaken by Australian companies. Our study finds that in the six-year period 1989-1995, around 30 companies listed on the Australian Stock Exchange (ASX) undertook share buy-backs. In contrast, during 1996-98 over 100 companies announced share buy-back programs.

Changes to the legal regulation of share buy-backs that occurred in December 1995 may explain the significant increase in buy-backs undertaken since that date. Although Australian corporate law still provides for five types of buy-backs, the mandatory requirements needed to undertake a buy-back have been substantially reduced. The changes that occurred in 1995 to deregulate share buy-backs included the following:

- (i) There is no longer a need for companies to have buy-back authorizations in their constitutions.
- (ii) Directors of a company wishing to undertake a buy-back are no longer required to sign a solvency statement under which they may be liable for a period of twelve months from the date of the statement should the company become insolvent. Rather, directors will only be personally liable if, at the time of the buy-back, the company was insolvent.

² See, for example, section 160 of the Delaware Law of Corporations and Business Organizations.

³ H Henn and J Alexander, *Laws of Corporations*, 3rd ed, 1983, West Publishing Company, St Paul.

- (iii) A public company may acquire more than 10 percent of its shares in a twelve month period provided it obtains the approval of more than 50 percent of shareholders who vote on the resolution.
- (iv) An auditor is no longer required to provide a report in relation to a buy-back.
- (v) For a selective buy-back, the shareholder approval requirements are lessened with only 75 percent of shareholders voting being required to approve the resolution (with no votes being cast in support of the resolution by any person whose shares are proposed to be bought back or any associates of that person).

III. REASONS FOR UNDERTAKING SHARE BUY-BACKS

There are a number of possible reasons why companies undertake share buy-backs. These reasons can be classified in the following way:

- (i) *Leverage.* Since buy-backs will often increase financial leverage, companies with additional debt capacity may buy-back shares in order to move the company toward a more desirable capital structure.
- (ii) *Information signalling.* A buy-back may be due to management possessing favourable information not known to the market about the future cash flows of the company. The buy-back will consequently represent management's signal that the company is undervalued.
- (iii) *Anti-takeover mechanism.* A buy-back may be used as a defensive tactic in a hostile takeover by increasing the leverage of the company and reducing the liquidity and the number of shares available to the hostile raider.
- (iv) *Wealth transfer.* A buy-back that is undertaken when shares are undervalued transfers wealth to non-participating from participating (selling) shareholders. A buy-back may also result in a wealth transfer from bondholders or creditors to the non-participating shareholders because the increased debt used to finance the buy-back reduces the assets of the company and therefore the value of the claims of the creditors.
- (v) *Free cash flow.* This theory of buy-backs is based upon the work of Jensen.⁴ Jensen analyses the problems that exist when a company generates substantial "free cash flow" (i.e., funds that cannot be efficiently invested on behalf of shareholders because of a lack of profitable investment opportunities). For such companies, share buy-backs are an efficient means of returning funds to shareholders who can make better use of these funds than can the company.
- (vi) *Earnings per share.* It is sometimes argued that companies engage in share buy-backs in order to increase earnings per share.⁵

⁴ M C Jensen, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers" (1986) 76 *American Economic Review* 323.

⁵ It has been observed that earnings per share may not increase with a reduction in shares outstanding because of a share buy-back. Because the company must pay out assets to finance the buy-back (unless new debt finances the buy-back), the size of the company (and its earnings) will decline with a decrease in shares outstanding: J M Netter

These are the main reasons why companies may undertake share buy-backs. However, it is not an exhaustive list. Other possible reasons include diminution of administrative overheads (by eliminating fractional shares and odd-lot holdings) and encouragement of employee share schemes (by enabling a company to acquire the shares of a departing employee).⁶ In the United States, the favourable tax treatment that a buy-back receives when compared to a dividend provides a further explanation for the use of buy-backs in that country.⁷

A number of United States studies have endeavoured to evaluate these possible reasons for share buy-backs. The results of these studies are reviewed in the following section.

IV. PRIOR SHARE BUY-BACK STUDIES

Because share buy-backs undertaken by United States companies constitute a substantial proportion of the total amount of cash distributions made by these companies to their shareholders,⁸ there have been many empirical studies of buy-backs undertaken in that country. Prior to reviewing the results of these studies, it is necessary to outline briefly the various types of buy-backs permitted in the United States.

Buy-backs in the United States can be undertaken in one of four ways: a fixed-price tender-offer, a Dutch-auction tender-offer, an open-market buy-back or a targeted buy-back. Each of these forms of buy-back is now elaborated.

- (i) *Fixed-price tender-offer.* In this type of buy-back, the company offers to buy a specified amount of shares at a given price (typically above the market price) until the expiration date (which is generally three weeks to one month after the offer).
- (ii) *Dutch-auction tender-offer.* This type of buy-back is similar to a fixed-price tender-offer in that the company states the number of shares that it wishes to acquire. However, with a Dutch-auction offer, the company states a price range within which shareholders may tender their shares rather than tendering them at a predetermined fixed-price. The company then selects the price required for it to purchase the minimum number of shares that it wishes to acquire. All shareholders tendering at or below the selected price receive the selected price for their shares.
- (iii) *Open-market buy-back.* This type of buy-back involves a company buying back small quantities of its shares from day-to-day in the open-market through a stockbroker. The seller of the shares will typically not be aware that he or she is selling shares to the company. These types of buy-backs may take place over several years.
- (iv) *Targeted buy-back.* This type of buy-back occurs where a company acquires a block of shares from a particular shareholder by direct negotiation.

and M L Mitchell, "Stock - Repurchase Announcements and Insider Transactions after the October 1987 Stock Market Crash" (1989) 18 *Financial Management* 84 at 85.

⁶ For further elaboration of these reasons, see Companies and Securities Law Review Committee, *A Company's Purchase of its Own Shares – Report to the Ministerial Council* (1987).

⁷ S Graw, "Company Share Buy-Backs: The Taxation Problems" (1989) 6 *Australian Tax Forum* 369 at 372-373.

⁸ L S Bagwell and J B Shoven, "Cash Distributions to Shareholders" (1989) 3 *Journal of Economic Perspectives* 129.

These are the main types of buy-backs undertaken in the United States although variations are possible.⁹ In comparison, the provisions of the Corporations Law regulating share buy-backs in Australia allow for both proportional and selective buy-backs, although the requirements for each differ.¹⁰

With respect to the United States empirical studies which have endeavoured to evaluate the various explanations advanced for undertaking share buy-backs, most of these studies support the information signalling explanation. In other words, a buy-back represents a signal by company management that the company is undervalued. Because of the importance of this finding, a number of these studies will be reviewed in detail. Another set of empirical studies has evaluated whether buy-backs undertaken as part of a takeover defence are in the interests of shareholders. However, prior to reviewing these two sets of studies, it should be noted that one study has found evidence supporting the free cash flow reason for buy-backs.¹¹ Another study found evidence that buy-backs transfer wealth from shareholders to creditors.¹² However, it should be noted that this study only examined buy-backs undertaken by one company. Moreover, other studies have found no evidence that creditors suffer as a result of share buy-backs.¹³

A. Buy-backs as a takeover defence

One group of studies has examined whether share buy-backs undertaken as part of a takeover defence are in the interests of shareholders. This debate has been carried on not only in the economics literature but also in the legal literature.¹⁴ The studies by economists which consider whether buy-backs undertaken as a part of a defence against a hostile takeover are in the interests of shareholders typically evaluate two hypotheses. The first of these is the management entrenchment hypothesis. It suggests that when managers undertake such buy-backs, they are acting in their own interests at the expense of shareholders. In particular, managers seek to

⁹ An innovation in the United States is the use of buy-backs through transferable put rights (TPRs). Under a TPR plan, the company issues put options to each shareholder in proportion to the number of shares owned. Each TPR gives the shareholder the right to sell back one share at a fixed price within a specified period. Shareholders who do not wish to sell back their shares are free to sell their TPRs in the open market. For further discussion of TPRs and their advantages, see J R Kale, T H Noe and G D Gay, "Share Repurchase Through Transferable Put Rights: Theory and Case Study" (1989) 25 *Journal of Financial Economics* 141.

¹⁰ The requirements for different types of buy-backs undertaken pursuant to the Corporations Law are summarised in H A J Ford, R P Austin and I M Ramsay, *Ford's Principles of Corporations Law*, 9th ed, 1999, Butterworths, Chapter 24.

¹¹ L S Bagwell and J B Shoven, "Share Repurchases and Acquisitions: An Analysis of Which Companies Participate" in A J Auerbach (ed), *Corporate Takeovers: Causes and Consequences*, 1988, The University of Chicago Press, Chicago, p 191.

¹² J W Wansley and E Faye, "Stock Repurchases and Securityholder Returns: A Case Study of Teledyne" (1986) 9 *Journal of Financial Research* 179.

¹³ See, for example, L Y Dann, "Common Stock Repurchases: An Analysis of Returns to Bondholders and Stockholders" (1981) 9 *Journal of Financial Economics* 113; T Vermaelen, "Common Stock Repurchases and Market Signalling: An Empirical Study" (1981) 9 *Journal of Financial Economics* 139.

¹⁴ For an introduction to the legal literature, see E Bielawski, "Selective Stock Repurchases After *Grobow*: The Validity of Greenmail under Delaware and Federal Securities Laws (1990) 15 *Delaware Journal of Corporate Law* 95; M Bradley and M Rosenzweig, "Defensive Stock Repurchases" (1986) 99 *Harvard Law Review* 1377; J N Gordon and L A Kornhauser, "Takeover Defense Tactics: A Comment on Two Models" (1986) 96 *Yale Law Journal* 295; M Bradley and M Rosenzweig, "Defensive Stock Repurchases and the Appraisal Remedy" (1986) 96 *Yale Law Journal* 322; L P Freidman, "Defensive Stock Repurchase Programs: Tender Offers in Need of Regulation" (1986) 38 *Stanford Law Review* 535; Note, "Greenmail: Targeted Stock Repurchases and the Management - Entrenchment Hypothesis" (1985) 98 *Harvard Law Review* 1045; C M Nathan and M Sobel, "Corporate Stock Repurchases in the Context of Unsolicited Takeover Bids" (1980) 35 *Business Lawyer* 1545.

retain their positions by employing a range of defensive tactics against hostile takeovers. One of these tactics is a share buy-back which may not only increase the leverage of the target company (thereby making it a less appealing takeover target) but also reduces the number of shares available to the offeror company.

In contrast, the shareholders' interest hypothesis states that when managers undertake share buy-backs as a takeover defence they are acting in the interests of shareholders. This is because when managers are confronted by the threat of a hostile takeover they may adopt a short-term focus with respect to investment decisions.¹⁵ This may not be in the interests of all shareholders.¹⁶ Therefore, defensive tactics, including buy-backs, by decreasing the threat of a hostile takeover, allow managers to make long-term investment decisions.

Buy-backs undertaken as a defence against hostile takeovers can take one of two main forms. First, it could be a targeted or negotiated share buy-back of one shareholder who has acquired a substantial shareholding in the company and is threatening a hostile takeover. The second form is a general share buy-back which, as we have seen, can operate as a takeover defence by reducing the number of shares available to the hostile offeror.¹⁷ With respect to general share buy-backs undertaken as a takeover defence (excluding targeted buy-backs), several empirical studies have concluded that this type of buy-back is not in the interests of the shareholders of target companies. In other words, the management entrenchment hypothesis is supported by these studies.

For example, one study of 49 defensive share buy-back announcements made by US companies over the period 1980-1987 found that the announcement of defensive share buy-backs was associated with an average negative impact on the share price of the target companies.¹⁸ A further study of 62 buy-backs undertaken by US companies found that although the sharemarket reacted positively to buy-back announcements not made as part of a takeover defence, it reacted negatively to those buy-backs used by companies to prevent takeovers.¹⁹

With respect to negotiated or targeted share buy-backs, the results of studies undertaken by economists are mixed. In theory, these types of buy-backs can either harm or benefit non-participating shareholders. On the one hand, it may be desirable for the company to buy-back

¹⁵ "...more and more of our businesses are forced to concentrate on results in the next three months. They are being run so as to encourage the institutional investors, on which all publicly-traded companies today depend for their supply of capital, to hold onto the company shares rather than to toss them overboard the moment the first hostile takeover bid appears." P F Drucker, "Corporate Takeovers: What is to be Done?" (1986) 82 *The Public Interest* 3 at 13.

¹⁶ For example, a short-term focus with respect to investment decisions may lead to a lack of investment in research and development as such investment may only yield results in the long-term.

¹⁷ Such a repurchase can also deter hostile takeovers by making them more expensive. It does this by removing shareholders who are willing to sell their shares at low prices leaving the hostile offeror facing shareholders who require higher prices to sell their shares: L S Bagwell, "Share Repurchase and Takeover Deterrence" (1991) 22 *Rand Journal of Economics* 72.

¹⁸ D J Denis, "Defensive Changes in Corporate Payout Policy: Share Repurchases and Special Dividends" (1990) 45 *Journal of Finance* 1433. The author examined not only share buy-backs announced by target companies as part of a takeover defence but also announcements of special dividends as part of a takeover defence.

¹⁹ W N Davidson and S H Garrison, "The Stock Market Reaction to Significant Tender Offer Repurchases of Stock: Size and Purpose Perspective" (1989) 24 *Financial Review* 93. There is also evidence that there is a negative share price reaction (and therefore a decline in shareholder wealth) when managers respond to attempted hostile takeovers with a range of defensive changes in asset and ownership structure including share buy-backs: L Y Dann and H DeAngelo, "Corporate Financial Policy and Corporate Control: A Study of Defensive Adjustments in Asset and Ownership Structure" (1988) 20 *Journal of Financial Economics* 87.

the shares of an individual shareholder where that shareholder is disrupting or threatening to disrupt the operation of the company. On the other hand, managers may buy-back the shares of an individual shareholder to entrench themselves against a hostile takeover that otherwise would be commenced by the shareholder and this may not be in the interests of shareholders where they are denied the right to consider the takeover offer. An early study of targeted share buy-backs undertaken by US companies during the period 1974-1980 found that these buy-backs were associated with a decline in the share price of the companies undertaking the buy-backs.²⁰ The authors conclude that the evidence is inconsistent with the shareholders' interest hypothesis.

A more recent study which examined the share prices of companies undertaking targeted buy-backs over a longer period of time reached different conclusions.²¹ The authors examined the share prices of the relevant companies from the time of the initial acquisition of the shares by the individual shareholder to the time they were repurchased by the company. The main conclusion of the study is that, on average, share prices rise in response to the acquisition of shares by the individual shareholder and the announcement of the acquisition. Share prices fall when the targeted buy-back is announced. However, the share price increases associated with the initial acquisition more than offset the decreases at the time of the buy-back. The average total return to shareholders in these companies was 7.4 per cent throughout the period from the initial acquisition through to the buy-back.²²

A similar result was reached by Klein and Rosenfeld.²³ The authors examined the share prices of 77 US companies undertaking targeted buy-backs from the time of the initial acquisition of the shares in the company to their repurchase by the company. Although the announcement of a targeted share buy-back resulted in a negative price reaction, over the entire period, non-participating shareholders received positive share returns of more than 12 per cent.²⁴

B. Buy-backs as information signalling

The explanation for share buy-backs undertaken in the United States that has the strongest empirical support is information signalling. When a company buys back its shares, management gives an information signal to shareholders. However, the signal may be ambiguous. On the

²⁰ M Bradley and L M Wakeman, "The Wealth Effects of Targeted Share Repurchases" (1983) 11 *Journal of Financial Economics* 301.

²¹ W H Mikkelson and R S Ruback, "Targeted Repurchases and Common Stock Returns" (1991) 22 *Rand Journal of Economics* 544.

²² Ibid. The authors note that their share price evidence alone cannot identify whether the buy-back was necessarily in the best interests of shareholders. This is because even though there were increased returns to shareholders, there may have been a higher-valued alternative available to managers to increase the wealth of shareholders, other than the targeted buy-back. The authors use data on the frequency of takeover bids before and after the buy-back to infer whether takeover bids are available alternatives to managers who undertake targeted buy-backs. The evidence suggests that this alternative was not available because takeover bids were infrequent before the targeted buy-backs. The authors note that in their sample, a publicly announced takeover bid preceded the targeted buy-back in only 4 of 111 cases.

²³ A Klein and J Rosenfeld, "The Impact of Targeted Share Repurchases on the Wealth of Non-Participating Shareholders" (1988) 11 *Journal of Financial Research* 89.

²⁴ One study has examined whether managers overpay when they undertake a targeted or negotiated buy-back: W H Mikkelson and H Regassa, "Premiums in Block Transactions" (1991) 12 *Managerial and Decision Economics* 511. The authors examined whether the premiums that managers pay in targeted buy-backs differ from the premiums that independent third parties pay for blocks of shares. They compared 117 targeted buy-backs with 37 negotiated third-party purchases of shares. The authors found that the premiums paid in purchases of blocks of shares and those paid in targeted buy-backs of blocks of shares were not significantly different. They conclude that when managers undertake targeted buy-backs, they pay a premium that corresponds to the market value of the shares as a block.

one hand, it may be that the company has no profitable use for its funds and therefore undertakes a buy-back as a means of returning these funds to shareholders. On the other hand, management may believe that the company is undervalued and a buy-back which is undertaken at a significant premium above the current market price is a means by which management passes this information on to shareholders.

The signalling theory of buy-backs can be tested empirically. In particular, the share prices of companies undertaking buy-backs can be examined in order to determine whether or not any premium that is offered to shareholders by the company to acquire their shares is permanent.²⁵ If it is, this is strong evidence that the buy-back signals that, at the time the buy-back occurs, the shares of the company are undervalued.

One of the most influential studies of buy-backs by US companies was undertaken by Vermaelen.²⁶ He examined 131 buy-back tender-offers. The average premium offered to shareholders as part of the buy-back was 23 per cent. Vermaelen concluded that 13 per cent of the positive returns received by shareholders was permanent. He attributed the positive sharemarket reaction to an information signalling effect whereby management undertakes a buy-back to convince investors that the shares of the company are undervalued. He further found that the magnitude of the premium offered to shareholders was positively related to the percentage of outstanding shares repurchased and the fraction of the company's shares owned by managers. This evidence is consistent with the signalling explanation. These factors should be positively related to the sharemarket's perception of the strength of the managers' conviction that their shares are undervalued.²⁷ Vermaelen also found that the faith of the managers in the future prospects of their companies (and hence the validity of the signalling explanation) was accompanied by subsequent abnormal earnings performance. The companies Vermaelen examined exhibited abnormally high earnings during the five years following the share buy-backs.

A number of other studies have found support for the signalling explanation.²⁸ In his study, Dann found that share buy-backs led to shareholders experiencing positive share returns of approximately 15 per cent and that these positive returns were mostly permanent in that share prices did not return to their pre-buy-back date levels. He concludes with the observation that "the results are consistent with the hypothesis that repurchase tender-offer announcements constitute a revelation by management of favorable new information about the value of the company's future prospects".²⁹ A more recent study has found that buy-backs are followed by abnormally high earnings by the companies, a result consistent with Vermaelen's earlier study

²⁵ In other words, that the share price permanently increases following the buy-back announcement.

²⁶ T Vermaelen, "Common Stock Repurchases and Market Signalling: An Empirical Study" (1981) 9 *Journal of Financial Economics* 139.

²⁷ For further elaboration, see T Vermaelen, "Repurchase Tender Offers, Signalling, and Managerial Incentives" (1984) 19 *Journal of Financial and Quantitative Analysis* 163.

²⁸ See, for example, Netter and Mitchell, *supra*, n 5; Dann, *supra*, n 13.

²⁹ Dann, *supra*, n 13, at 136. One study has examined whether share buy-backs have an effect on other companies operating in the same industry: M G Hertz, "The Effects of Stock Repurchases on Rival Companies" (1991) 46 *Journal of Finance* 707. The author observes that information conveyed by a buy-back announcement may be relevant for rival companies in at least two ways. First, the information may reflect economic conditions facing the industry as a whole. Second, the information may reflect a change in the competitive balance within the industry. However, after examining 134 buy-back announcements and findings that these announcements had little or no effect on the share price of rival companies, the author concludes that the information contained in buy-back announcements is primarily company-specific.

and with the hypothesis that managers announce buy-backs when they believe the shares of their company are undervalued.³⁰

The information signalling explanation for buy-backs also receives support from a survey of 140 chief financial officers of US companies which undertook share buy-backs. The questionnaire asked the respondents to comment upon a number of possible explanations for why their companies had undertaken share buy-backs. The only explanation for which there was significant agreement among respondents was that the buy-back was undertaken to convey management's opinion of the company's present and future value. The authors of the study conclude with the following observation:

"An important finding of this research is that managers do use share repurchases to signal their confidence in the company, which management believes is not being incorporated in [share prices]. All parties agree with the informational signalling hypothesis of share repurchases, both as a reason for repurchase and as an important component of [repurchase] premiums."³¹

Finally, the information signalling explanation is supported by evidence that, upon a buy-back announcement, financial analysts revise upwards their estimates of earnings forecasts for the company.³² If buy-back announcements convey information that management believes the shares of the company are undervalued, then this response by analysts is expected.

The signalling explanation for buy-backs depends upon managers having confidential information about the prospects of the company which is not available to shareholders. There is substantial evidence that managers have such information. For example, it has been demonstrated in many empirical studies that when managers trade in the shares of their own companies they consistently out-perform the market.³³ This indicates that managers have information which is not available to other shareholders. However, an important question concerning the signalling explanation remains. If management has confidential information about the prospects of the company and wishes to convey this to shareholders, why not make a public announcement to shareholders, rather than undertake an expensive buy-back?

One reason is that the liability provisions of the Corporations Law may deter managers from making public announcements. Consider a situation where management believes that the profitability of the company will improve during the next financial year. Management could disclose this by making a profit forecast. However, the Corporations Law imposes the risk of personal liability on those who make a representation with respect to a future matter, such as a

³⁰ L Y Dann, R W Masulis and D Mayers, "Repurchase Tender Offers and Earnings Information" (1991) 14 *Journal of Accounting and Economics* 217. Buy-backs convey information to shareholders not only in regard to management's expectations regarding future earnings but also the level of risk associated with the company: E Bartov, "Open-Market Stock Repurchases as Signals for Earnings and Risk Changes" (1991) 14 *Journal of Accounting and Economics* 275. The author observes that an open-market buy-back may convey information about a decline in the risk associated with the company in one of two ways. First, the decline in risk may represent a reduction in the volatility of the company's future operating cash flows. Alternatively, the reason for the decline in risk may be that higher earnings that are not fully paid out implies a lower debt-equity ratio which in turn implies a lower financial risk.

³¹ J W Wansley, W R Lane and S Sarkar, "Managements' View on Share Repurchase and Tender Offer Premiums" (1989) 18 *Financial Management* 97 at 106.

³² M Hertz and P C Jain, "Earnings and Risk Changes Around Stock Repurchase Tender Offers" (1991) 14 *Journal of Accounting and Economics* 253.

³³ For a survey of these studies, see I M Ramsay, "Directors' Share Deals: Going Public" (1992, September) *Journal of the Securities Institute of Australia* 8.

profit forecast, if they do not have reasonable grounds for making the representation.³⁴ Because of the risk of personal liability, management may choose to inform the market of its expectations by other means, such as a share buy-back.

Other reasons why management may signal its expectations with buy-backs (and also with dividends) are given by Asquith and Mullins.³⁵ They argue that announcements of both dividends and share buy-backs are effective signals because they:

"...are backed by hard, cold cash. The company must generate this cash internally or convince the capital markets to supply it. Alternative communications may lack the credibility that comes from 'saying it with cash'. Investors may suspect that statements by management are backed by the ghostwriting of well paid public relations specialists. They may feel that financial statements have been skillfully massaged by the financial staff."³⁶

The authors also argue that these types of cash payments to shareholders have the advantages of simplicity and visibility:

"Many other announcements are, at the same time, complex and detailed in focus. They require time and expertise to decipher. In contrast, few investors fail to notice and understand a cheque in the mail. An empty mailbox is also easily interpreted."³⁷

Finally, the authors observe that signals conveyed by either a buy-back or dividend can convey information without releasing sensitive details that may be useful to competitors.³⁸

A further issue is whether different types of buy-backs convey signals of different strengths. It will be recalled that in the United States, managers may choose among three main types of buy-backs: an open-market buy-back, a tender-offer buy-back or a targeted buy-back. If management decides on a tender-offer buy-back, it then has the option of considering the traditional fixed-price offer or the Dutch-auction method.

In his 1981 study, Vermaelen studied 131 tender-offer buy-backs and 243 open-market buy-backs.³⁹ In the conventional tender-offer buy-back, management announces the number of shares it wants to repurchase, the expiration date of the offer, and the single price the company will pay for all shares acquired. In contrast, an open-market buy-back occurs where a company buys back relatively small quantities of its shares in the open-market over a period of time. The purchases are executed through brokers at the current market price. Vermaelen argued that open-market buy-backs provide less powerful signals than tender-offer buy-backs. He found that tender-offer buy-backs resulted, on average, in permanent gains to shareholders of 13 per cent. In contrast, open-market buy-backs resulted in permanent gains to shareholders of only 2 per cent.⁴⁰

³⁴ Corporations Law, s 728(2).

³⁵ P Asquith and D W Mullins, "Signalling with Dividends, Stock Repurchases, and Equity Issues" (1986) 15 *Financial Management* 27.

³⁶ *Ibid* at 35.

³⁷ *Ibid* at 35-36.

³⁸ *Ibid* at 36.

³⁹ Vermaelen, *supra*, n 26.

⁴⁰ *Ibid*.

It may be that Dutch-auction buy-backs also convey a weaker signal to shareholders than the traditional fixed-price tender-offer buy-back. It will be recalled that in a Dutch-auction buy-back, the company does not offer to acquire shares at a single price. Rather, it announces that it will acquire shares within a specified range. Once the offer period expires, the company determines the lowest price within the range that will allow it to buy back the number of shares that it seeks. Comment and Jarrell examined 97 fixed-price tender-offer buy-backs and 72 Dutch-auction buy-backs over the period 1984-1989.⁴¹ They found that, on average, Dutch-auctions resulted in an average positive return to shareholders of 7.7 per cent, compared with 11.9 per cent for fixed-price buy-backs. The authors conclude that a Dutch-auction buy-back is a less credible signal than a fixed-price buy-back:

"Because a Dutch auction offer allows owner-managers to guarantee a relatively low (minimum) offer price, it follows that Dutch auctions should provide a less-credible signal than would an otherwise-equivalent fixed-price offer. It lowers the stakes in management's visible gamble that their stock is undervalued."⁴²

The authors also believe that Dutch-auctions are less informative than fixed-price buy-backs as signals of undervaluation:

"For a financial decision to be an effective signal, its characteristics must reflect the choices of informed insiders. In a fixed-price offer, inside managers establish the terms of trade, and outsiders react to these terms by accepting or rejecting the offer. In a Dutch auction, however, outsiders have an active role in establishing the terms of trade by choosing their tendering prices. To the extent that it is the outsiders' reservation prices that are discovered in a Dutch auction, it seems a curious vehicle for the signalling of inside information."⁴³

The final issue for discussion is the relationship between the signalling explanation for buy-backs and the fact that small companies tend to undertake more buy-backs than large companies. We have already noted that a buy-back signal will be stronger the higher the premium offered, the higher the target fraction of shares sought to be acquired and the higher the proportion of management shareholdings in the company. In one of his studies, Vermaelen observed that small companies undertaking buy-backs satisfied these criteria more than large companies. He concluded that small companies signal more information with buy-backs than do large companies when they undertake buy-backs.⁴⁴ A subsequent study has also documented that the smaller the company undertaking the buy-back, the larger the returns received by shareholders -

⁴¹ R Comment and G A Jarrell, "The Relative Signalling Power of Dutch-Auction and Fixed-Price Self-Tender Offers and Open-Market Share Repurchases" (1991) 46 *Journal of Finance* 1243.

⁴² Ibid at 1247.

⁴³ Ibid at 1247-1248. However, one study has reached a contrary conclusion and the authors argue that a Dutch-auction buy-back may be able to convey favourable information to shareholders more efficiently than a fixed-price tender offer buy-back: S Kamma, G Kanatas and S Raymar, "Dutch Auction Versus Fixed-Price Self-Tender Offers for Common Stock" (1992) 2 *Journal of Financial Intermediation* 277. Another study has examined whether companies overpay for shares in fixed-price tender-offer buy-backs, compared to Dutch-auction buy-backs: D R Peterson and P P Peterson, "Dutch Auction Versus Fixed-Price Self-Tender Offers: Do Companies Overpay in Fixed-Price Offers?" (1993) 16 *Journal of Financial Research* 39. After controlling for differences in the proportion of shares sought and the size of the companies, the authors found an insignificant difference between the purchase premiums in the two types of buy-backs. In other words, differences in company size and the proportion of shares sought jointly explain why smaller premiums are observed for Dutch-auction buy-backs. The conclusion of the authors is that there is no evidence of overpayment by managers in fixed-price tender-offer buy-backs relative to Dutch-auction buy-backs.

⁴⁴ Vermaelen, *supra*, n 26.

a result consistent with the theory that small companies signal more information than large companies when they undertake buy-backs.⁴⁵

Why might small companies be signalling more information than large companies? Commentators have advanced a number of reasons. First, small companies are much less followed and evaluated by financial analysts and the financial press than large companies.⁴⁶ Second, small companies have much less institutional investment than large companies.⁴⁷ It has been demonstrated that institutional investors perform a valuable function in acquiring information from companies in which they invest and informing the capital market of this information. There are a number of explanations for this:⁴⁸

- (i) institutions typically have greater resources than individual investors to expend on obtaining and analysing corporate information;
- (ii) economies of scale and professional expertise give institutions lower marginal costs in acquiring information, as a result of which they can acquire more information of higher quality;
- (iii) some institutional investors (such as insurance companies and banks) may have business relationships with the company that provides them with information that is unavailable to other investors;
- (iv) institutions have greater incentives than individual shareholders to monitor the activities of companies because they typically have larger investments;
- (v) because institutions typically trade more frequently than individual investors, this increases the likelihood of new information being rapidly incorporated into share prices.

There is evidence from a recent study of buy-backs undertaken by US companies that both the premium offered to acquire the shares and the sharemarket reaction to the announcement of the buy-back is less for companies that have a large market capitalisation or are widely held by institutional investors.⁴⁹ According to the authors, this evidence indicates that when small companies undertake buy-backs, they impart more information to their shareholders than when large companies undertake buy-backs.

⁴⁵ J Lakonishok and T Vermaelen, "Anomalous Price Behavior Around Repurchase Tender Offers" (1990) 45 *Journal of Finance* 455.

⁴⁶ Ibid.

⁴⁷ For Australian evidence, see G Stapledon, "Australian Sharemarket Ownership" in G Walker, B Fisse and I Ramsay (eds), *Securities Regulation in Australia and New Zealand*, 2nd ed, 1998, LBC Information Services, Sydney; I M Ramsay and M Blair, "Ownership Concentration, Institutional Investment and Corporate Governance: An Empirical Investigation of 100 Australian Companies" (1993) 19 *Melbourne University Law Review* 153.

⁴⁸ S H Szewczyk, G P Tsetsekos and R Varma, "Institutional Ownership and the Liquidity of Common Stock Offerings" (1992) 27 *Financial Review* 211 at 214.

⁴⁹ W Pugh and J S Jahera, "Stock Repurchases and Excess Returns: An Empirical Examination" (1990) 25 *Financial Review* 127.

C. Proportion of shares actually bought back

Stephens and Weisbach⁵⁰ find that, on average, companies announcing share buy-backs repurchase almost 75 per cent of the announced targeted level of shares. They also find that more than one-half of the companies buy back at least the number of shares targeted in the initial announcement, while around 30 per cent of the companies continue to repurchase shares after completing the initially announced buy-back level. They reject the anecdotal evidence provided in the financial press which suggests that the actual level of acquisition is small relative to companies' announced intentions and that on-market buy-backs are merely attempts by management at raising their companies' stock price at a low cost.

D. Previous Australian study

The only published Australian study on the share price effects of buy-backs is by Harris and Ramsay.⁵¹ Their study examines share buy-backs for the period 1989-93. They find that although the announcement of share buy-backs is associated with a positive abnormal price performance, the effect is not statistically significant. Their findings are contrary to the US evidence and the authors suggest that this may be due to the overregulated environment with respect to share buy-backs in Australia. Specifically, share buy-backs are not seen by management as a useful instrument to inform investors about "undervaluation" of the company's equity.

E. Summary

This section has reviewed the results of empirical studies of share buy-backs. The first set of US studies examined whether buy-backs undertaken as part of a takeover defence are in the interests of shareholders. It was seen that the results of these studies are mixed. Typically, the announcement of a buy-back as part of a defence against a hostile takeover results in a decline in the share price of the company making the announcement. However, in the case of targeted or negotiated buy-backs, several studies have found that although the announcement of a targeted buy-back results in a negative share price reaction, over the period from the initial acquisition of shares by the individual shareholder to their repurchase by the company, non-participating shareholders receive positive share returns.

In contrast to the mixed results for the first set of studies, the second set of US studies found strong support for the information signalling explanation of buy-backs. These studies demonstrate that buy-backs:

- (i) result in permanent increases in the share prices of the companies undertaking the buy-backs;
- (ii) are followed by abnormally high earnings by the companies undertaking the buy-backs; and
- (iii) result in financial analysts revising upwards their estimates of earnings forecasts for the companies undertaking the buy-backs.

⁵⁰ C Stephens and M Weisbach, "Actual Share Reacquisitions in Open-Market Repurchase Programs (1998) 53 *Journal of Finance* 313.

⁵¹ T Harris and I Ramsay, "An Empirical Investigation of Australian Share Buy-backs" (1995) 4 *Australian Journal of Corporate Law* 393.

This evidence provides strong support for the information signalling explanation of buy-backs. The signalling explanation is also supported by the results of a survey of chief financial officers of US companies which undertook buy-backs. There was substantial agreement among respondents that their companies had undertaken buy-backs in order to convey management's opinion of the present and future value of the company.

V. EMPIRICAL STUDY

A. Sample and Method

Our analysis focuses on all types of share buy-backs announced by companies trading on the ASX during January 1989 - December 1998. Our initial sample of buy-back announcements is obtained from the Australian Business Index (ABIX), the ASX's Datadisc, and supplemented with information from Bridge Information System. To be included in the final sample we require that: (a) there are no other confounding events reported in the five days before and after the announcement date of the buy-back, and (b) daily returns over the estimation and examination periods are available. These criteria resulted in a final sample of 136 share buy-backs.⁵² Over 75 per cent of the buy-backs are on-market share buy-backs and over two-thirds of all share buy-backs are concentrated during 1995-98. Data on daily stock prices and dividends and the All Ordinaries market index are obtained from ASX records vendored by a third party. Table 1 shows the annual distribution of the final sample of buy-backs analyzed.

We use the standard event study method to evaluate the market's reaction to announcements of share buy-back programs. Details of the method used appear in Appendix B. The abnormal returns are estimated using the market model where the market model parameters are estimated over days -270 to -31 relative to the announcement day, defined as day 0.⁵³ We define the announcement period as days (-1, 0) and we test the hypothesis that the average abnormal and cumulative abnormal returns over these days are equal to zero. To verify whether there is any "leakage" of information prior to share buy-backs being announced we examine the cumulative abnormal returns over days (-20, +20) relative to the announcement day. Finally, to determine whether outliers may be affecting our results we also use a non-parametric sign test, which examines whether the proportion of positive abnormal returns is statistically different from the abnormal returns during the estimation period.

B. Results and Discussion

1. *Analysis of Abnormal Returns for the Full Sample of Share Buy-backs*

Table 2 presents the results for the daily average abnormal returns and cumulative abnormal returns for the full sample of 136 share buy-backs announced during 1989-98. Over the period leading up to the announcement day we observe a significant run-up in prices with the cumulative abnormal returns over days (-10, 0) and (-5, 0) of over 2.0 per cent and 3.0 per cent, respectively, both significant at the 0.01 level (Panel B). The average abnormal returns

⁵² The initial sample consisted of 179 share buy-back announcements. Of these, 43 announcements did not meet the criteria outlined above and were removed from the final sample leaving a total of 136 announcements.

⁵³ There may be a concern that the results are distorted because of possible non-synchronous trading. To address this issue we reestimated the market model abnormal returns using the Scholes and Williams adjustment: see M Scholes and J Williams, "Estimating Betas from Non-Synchronous Data" (1977) 5 *Journal of Financial Economics* 309. The results obtained were similar to those reported here.

over the announcement period of days (-1, 0) are +0.5 per cent and +1.2 per cent, respectively, both statistically significant at the 0.05 level, and better (Panel A). The proportion of positive abnormal returns on days (-1, 0) are 57.4 per cent and 66.2 per cent, respectively, both statistically significant at the 0.10 level, and better. Thus, our results are not being driven by a few large positive abnormal returns.

Table 2 also shows the abnormal return behaviour of companies over the days following the announcement day. We find that the significant market reaction over days (-1, 0) persists on day +1 with companies earning a statistically significant abnormal return of over 1.0 per cent with over 63 per cent of the companies experiencing positive abnormal returns.⁵⁴ The run-up in prices is also permanent as observed by the statistically significant cumulative abnormal returns of +4.6 per cent and +3.3 per cent over days (-5, +5) and (-10, +10).

2. *Analysis of Abnormal Returns by Type of Share Buy-back*

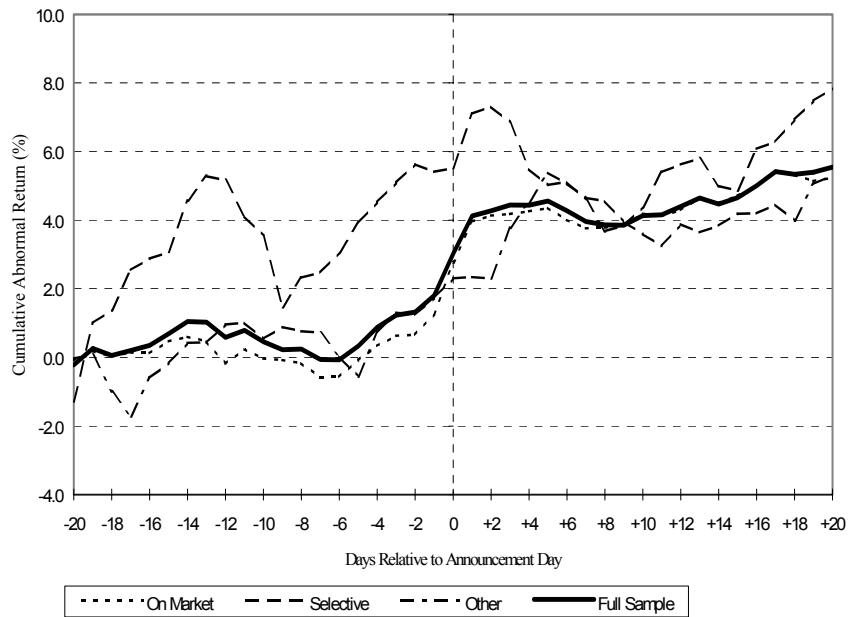
Harris and Ramsay,⁵⁵ among others, find that the market's reaction to share buy-backs differs by the type of share buy-back announced. The results for the market's reaction to the disaggregated sample of 103 on-market buy-backs, 16 selective buy-backs and 17 other buy-backs appear in Table 3 and Figure 1.⁵⁶

⁵⁴ This observation is not surprising because it is possible for share buy-backs to be announced after the market has closed for trading on day 0. In this case, the market's reaction would be apparent on the following day.

⁵⁵ Harris and Ramsay, *supra*, n 51.

⁵⁶ We use an "other buy-backs" category because the sub-samples of equal access scheme, employee share scheme and minimum holding buy-backs are too small to warrant separate analyses. The separate results for equal access, employee and minimum holding share buy-backs are available from the authors upon request.

Figure 1: Cumulated Abnormal Returns for Full Sample and by Type of Share Buy-back Announced During 1989-98



The results for on-market buy-back announcements are similar to the full sample results. Over the announcement period of days (-1, 0) companies announcing on-market share buy-backs experience average abnormal returns of +0.6 per cent and 1.5 per cent, respectively, both significant at the 0.01 level (Panel A). These companies continue to earn significant average abnormal returns of +1.2 per cent on the day after the announcement day. As with the full sample, the sign test indicates that these results are not driven by outliers since between 58 per cent and 68 per cent of the companies earn positive average abnormal returns over days (-1, +1). The results over longer windows before and around the announcement day are also very similar to the full sample results (Panel B). Further, the cumulative abnormal returns over days (-5, +5) and days (-10, +10) are generally higher for on-market share buy-backs than for the full sample.

In contrast, the results for selective and other buy-back announcements reveal no significant market reaction during the announcement period of days (-1, 0). However, for selective share buy-back announcements the day +1 average abnormal return of almost +1.6 per cent is significant at the 0.10 level. During longer windows before and around the announcement day the cumulative abnormal returns for selective and other share buy-backs are positive but generally not statistically significant.⁵⁷ These results indicate that the full sample results are essentially being driven by announcements of on-market buy-backs and that, in general, the market does not react positively to announcements of other types of share buy-backs.

These differences in the market's reaction to different types of share buy-back programs is more easily observable in Figure 1 which plots the cumulative abnormal returns over days (-

⁵⁷ The exception to this is the observation of significant positive cumulative abnormal returns for other buy-backs over days (-5, +5).

20, +20) relative to the announcement day for the full sample and the sub-samples of on-market, selective, and other share buy-backs.⁵⁸

3. *Analysis of Abnormal Returns for Share Buy-backs Before and After the 1995 Simplification Act*

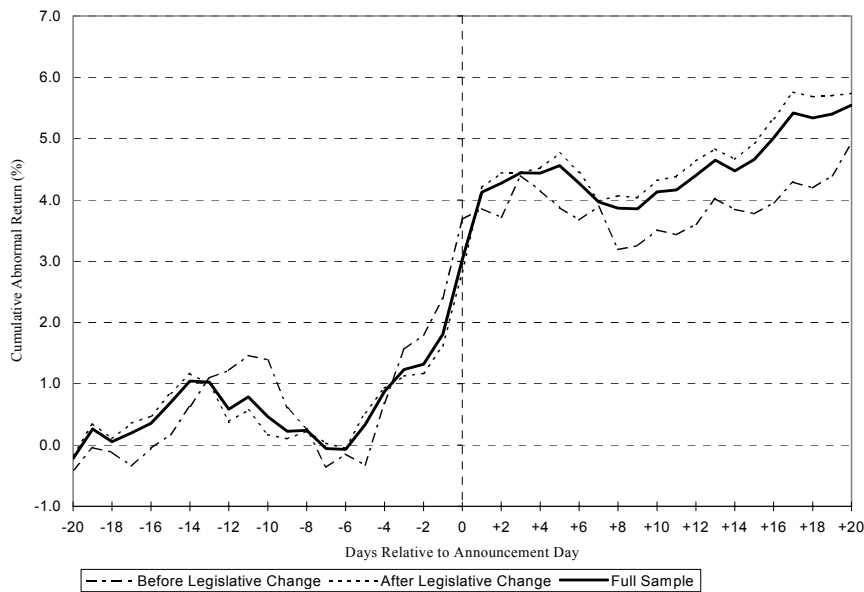
As mentioned in Section IV D, Harris and Ramsay⁵⁹ noted that share buy-backs in Australia were rare occurrences between 1989 and 1995 because of the overly regulated market. Since the introduction of First Corporate Law Simplification Act on December 9, 1995, the legal framework for buy-backs has been simplified substantially. To analyze the impact of this legislation on share buy-backs, we divide the sample of 136 buy-backs into announcements made before and after the introduction of the Simplification Act. This gives us two sub-samples of 32 share buy-backs before, and 104 buy-backs after, the change in legislation.

Table 4 and Figure 2 present the results on the effect of the Simplification Act on the market's reaction to share buy-back announcements. For share buy-backs before the Simplification Act, over the days (-10, 0) and (-5, 0) relative to the announcement day we observe significant cumulative abnormal returns of +2.2 per cent and +3.8 per cent, respectively (Panel B). The average abnormal returns over the announcement period of days (-1, 0) are +0.6 per cent and +1.3 per cent with only day 0 being statistically significant at the 0.05 level (Panel A). The cumulative abnormal returns over days (-5, +5) and days (-10, +10) are over +4 per cent and +2 per cent respectively, with only days (-5, +5) being statistically significant at the 0.05 level.

⁵⁸ It is important to note that although the magnitude of the CARs earned by companies announcing selective buy-backs is higher than for those announcing on-market buy-backs there are only 16 selective buy-backs in our sample. Further, the lack of significance for the sign test indicates these results are being driven by a few companies in this small sample.

⁵⁹ T Harris and I Ramsay, *supra*, n 51.

Figure 2: Cumulated Abnormal Returns for Full Sample of Share Buy-backs and Share Buybacks Announced Before and After the Legislative Change During 1989-98



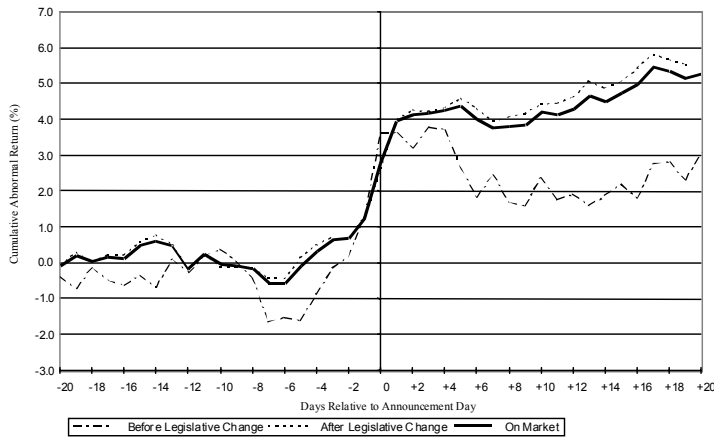
For share buy-back announcements after the Simplification Act the average abnormal returns over the announcement period of days (-1, 0) are +0.5 per cent and +1.2 per cent, respectively, both significant at the 0.05 level, and better. These companies continue to earn significant average abnormal returns on day +1 of almost +1.4 per cent, which is significant at the 0.01 level. The sign test indicates that outliers are not driving these abnormal returns. Comparing the cumulative abnormal returns over days (-1, +1), (-5, +5) and (-10, +10) for the two sub-samples we find that companies announcing share buy-backs after the Simplification Act generally significantly outperform companies announcing share buy-backs before the Simplification Act.

As mentioned above, we find that the results for the full sample of share buy-backs are essentially being driven by the sub-sample of on-market share buy-backs. Thus, we extend the analysis above and examine the abnormal return behaviour of only on-market share buy-backs before and after the 1995 Simplification Act to shed further light on Harris and Ramsay's contention that the complexity of the legislation governing share buy-backs was the main reason for their lack of popularity.

Table 5 and Figure 3 contain the results on the effect of the Simplification Act on the market's reaction to on-market share buy-back announcements. For on-market buy-backs announced before the Simplification Act, the average abnormal returns over the announcement period of days (-1, 0) are +1.1 per cent and +2.3 per cent with day 0 being statistically significant at the 0.01 level (Panel A). The cumulative abnormal returns over days (-5, +5) and days (-10, +10) are over +4 per cent and +2 per cent respectively, with only days (-5, +5) being moderately significant at the 0.10 level. In contrast, for on-market buy-backs announced after the Simplification Act, we observe statistically significant average abnormal returns over days (-1, 0) of +0.5 per cent and +1.4 per cent, with the abnormal

returns on day +1 of almost 1.4 per cent also being statistically significant. The cumulative abnormal returns over days (-5, +5) and days (-10, +10) are over +5 per cent and +4 per cent, respectively, and both significant at the 0.01 level. This outperformance of on-market share buy-backs announced after the Simplification Act can be clearly observed in Figure 3.

Figure 3: Cumulated Abnormal Returns for Full Sample of On Market Share Buy-backs and On Market Share Buy-backs Announced Before and After the Legislative Change During 1989-98



Overall, the results in Tables 4 and 5 are consistent with Harris and Ramsay's contention that the simplification of legislation governing share buy-backs, particularly on-market buy-backs, generally made them more effective signals of managerial information as observed by the significant positive market reaction after the Simplification Act.

4. *Analysis of Abnormal Returns by Industrial Classification of Share Buy-backs*

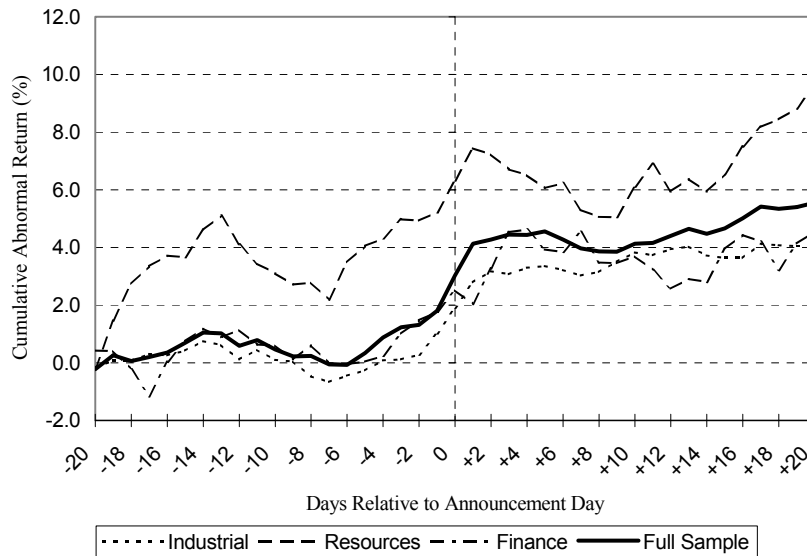
Our final sensitivity analysis involves examining whether the market's reaction to companies announcing share buy-backs is related to their industrial classification. Table 6 and Figure 4 report the results for the average abnormal returns and cumulative abnormal returns for the sub-samples of share buy-backs classified according to companies belonging to the non-financial industrial sector, and the financial services and resources sectors.⁶⁰ We note that almost 60 per cent of the share buy-backs announced during 1989-98 were made by non-financial industrial sector companies while the remaining announcements were equally split between companies in the financial services and resources sectors.

For companies in the industrial and financial services sectors we find positive and statistically significant abnormal returns on days (-1, 0), while for resource sector companies only the day +1 abnormal return is statistically significant. Over the longer event windows of days (-5, +5) and days (-10, +10) we find companies in the resource sector performing better than companies in the industrial and financial services sectors. However, the main point to note

⁶⁰ While the ASX has several industrial sector classifications we opt to use three broad classifications to ensure that our sub-samples are reasonably large.

here is that the market generally reacts positively to share buy-backs announced by companies belonging to different industrial sectors.⁶¹

Figure 4: Cumulated Abnormal Returns for Full Sample and by Industrial Classification of Share Buy-backs Announced During 1989-98



VI. CONCLUSIONS

The main questions we address in this Research Report are: (a) have the substantial changes in the legal regulation of buy-backs affected companies' financing decisions, and (b) have the informational effects of buy-backs changed significantly as a result of the changes in regulation. Our results indicate that the stringent regulation of share buy-backs during 1989-95 made them less effective as a credible signalling mechanism. Our results also indicate that the market generally reacts the most positively to on-market buy-backs, while the reaction to other types of share buy-backs is positive but generally not statistically significant. We also find that the abnormal returns earned by resource sector companies announcing share buy-backs are generally higher than the abnormal returns earned by share buy-backs announced by companies in the industrial and financial services sectors.

⁶¹ We also examined the abnormal return behaviour of only on-market share buy-backs for companies in different industrial sectors. The results (not shown) were similar to those reported in Table 6.

Appendix A
Details of the Main Mandatory Requirements Under the 1989 Legislation Governing
Share Buy-backs in Australia

The main requirements under the 1989 legislation included the following:

- (i) Allowing companies to initiate five types of share buy-back programs as detailed in Section II above.
- (ii) The company's constitution needed to be amended to contain a provision authorizing a buy-back and this required approval by 75 percent of those shareholders who voted.
- (iii) A buy-back authorization in the constitution could not exist for more than three years so that a further vote of shareholders was required for companies which wanted to have the authorization extend beyond three years.
- (iv) Detailed disclosure requirements were imposed upon a company which proposed to amend its constitution to have a buy-back authorization including the need for disclosure of both the potential advantages and the potential disadvantages of the buy-back authorization for the company, its directors and its shareholders.
- (v) A company could not undertake a buy-back unless its directors made a statement to the effect that it was their opinion that the company would remain solvent for the twelve months following the date of the statement (the statement must have been made not more than two months before the commencement of a buy-back).
- (vi) If the company became insolvent during the period of twelve months after a buy-back, the directors who signed the solvency statement could be personally liable to indemnify the company for the funds it paid out to shareholders to buy back their shares.
- (vii) A company could not undertake a buy-back unless its auditors, having enquired into the company's financial status, reported on the solvency statement of the directors and indicated that the statement was reasonable.
- (viii) A public company was prohibited from buying back more than 10 percent of its shares in a twelve month period.
- (ix) A public company could only undertake a selective buy-back if it was approved by (a) at least 75 percent in number of shareholders who voted on the resolution and (b) shareholders who together held at least 75 percent in value of the shares that were voted on the resolution (with no votes being cast in support of the resolution by any person whose shares were to be bought back or any associate of that person).

Appendix B Event Study Methodology

We compute the day t returns for company j as:

$$R_{jt} = \text{Ln}(P_{jt}\delta_{jt} + D_{jt}/P_{jt-1}), \quad (1)$$

where P_{jt} and P_{jt-1} are the respective daily prices for company j at time t and $t-1$, δ_{jt} is the dilution factor used to adjust the price for any capitalisation changes, and D_{jt} is the dividend paid by company j on day t .

We use the event study methodology to analyze the abnormal return behaviour around the announcement of share buy-backs. We assume that daily returns are generated from the market model as:

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt}, \quad (2)$$

where R_{jt} is the observed daily return for stock of company j at time t , R_{mt} is the observed daily returns for the market index at time t , α_j is the estimate of the intercept for company j , β_j is the estimate for beta of stock of company j , and ε_{jt} is the independently and identically distributed residual error term. The parameters α_j and β_j are assumed to be stationary over the estimation period and are estimated over days -270 to -31 relative to the announcement day, defined as day 0 .⁶²

Next, we calculate the abnormal returns for company j on day t as:

$$AR_{jt} = R_{jt} - \alpha_j - \beta_j R_{mt}. \quad (3)$$

To reduce company-specific effects and the effects of random estimation errors, we construct portfolios during event time such that each portfolio's daily abnormal return is an equally-weighted average of the abnormal returns of individual companies for that common event date. We compute the average abnormal return for the portfolios as,

$$AAR_t = \frac{\sum_{j=1}^N AR_{jt}}{N_t}, \quad (4)$$

where N_t is the number of companies in the portfolio on day t . To examine the market's reaction before and after the announcement of a share buy-back we also compute the cumulative abnormal return over various windows during days -20 to $+20$ relative to the buy-back announcement date as:

⁶² There may be a concern that the results are distorted because of possible non-synchronous trading in shares. To address this issue we reestimated the market model abnormal returns using the Scholes and Williams adjustment: see Scholes and Williams, *supra*, n 53. The results obtained were similar to those reported here.

$$CAR_t = \sum_{i=-20}^t AAR_i . \quad (5)$$

We define the announcement period as days (-1, 0) and we test the hypothesis that the average abnormal and cumulative abnormal returns over these days are equal to zero. To verify whether outliers may be affecting our results we use a non-parametric sign test, which examines whether the proportion of positive abnormal returns is statistically different from the abnormal returns during the estimation period.⁶³

⁶³ The sign test is computed as $(p - nr) / [n(1-r)r]^{1/2}$ where p is the number of positive abnormal returns on day t, n is the total number of returns in the portfolio on day t, and r is the fraction of positive abnormal returns during the estimation period.

Table 1: Annual Distribution of Share Buy-backs Announced During January 1989 - December 1998

| Year | Type of Share Buy-back | | | | | | Total | Percent |
|-------------------|------------------------|-------------|--------------|------------|-----------------|------------|--------------|--------------|
| | On-market | Selective | Equal Access | Employee | Minimum Holding | | | |
| 1989 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.7 |
| 1990 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 1.5 |
| 1991 | 7 | 2 | 0 | 0 | 0 | 0 | 9 | 6.6 |
| 1992 | 2 | 1 | 1 | 1 | 0 | 0 | 5 | 3.7 |
| 1993 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0.7 |
| 1994 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 1.5 |
| 1995 ^a | 4 | 5 | 2 | 1 | 2 | 2 | 14 | 10.3 |
| 1996 | 19 | 1 | 2 | 1 | 1 | 1 | 24 | 17.6 |
| 1997 | 29 | 1 | 0 | 0 | 1 | 1 | 31 | 22.8 |
| 1998 | 41 | 3 | 0 | 3 | 0 | 0 | 47 | 34.6 |
| Total | 103 | 16 | 6 | 7 | 4 | 4 | 136 | 100.0 |
| Percent | 75.7 | 11.8 | 4.4 | 5.1 | 2.9 | 2.9 | 100.0 | |

^a The legislative change was effective from December 9, 1995. Of the 14 share buy-back programs announced in 1995, 2 on-market share buy-backs were announced after the legislative change.

Table 2: Summary of Average Abnormal Returns and Average Cumulative Abnormal Returns for the Full Sample of Share Buy-backs Announced During January 1989 - December 1998

Panel A: Summary of Abnormal Returns Over Days -20 to +20 Relative to the Announcement Day

| Event Day | Average Abnormal Returns (%) | t-Statistic | Percent Non-Negative |
|------------------|-------------------------------------|--------------------|-----------------------------|
| -20 | -0.221 | -1.029 | 46.6 |
| -15 | 0.336 | 1.565 | 54.4 |
| -10 | -0.323 | -1.507 | 47.1 |
| -5 | 0.402 | 1.875* | 58.1* |
| -4 | 0.543 | 2.528** | 60.3** |
| -3 | 0.358 | 1.668* | 55.9 |
| -2 | 0.087 | 0.405 | 56.6 |
| -1 | 0.485 | 2.262** | 57.4* |
| 0 | 1.223 | 5.696*** | 66.2 |
| +1 | 1.099 | 5.119*** | 63.2*** |
| +2 | 0.145 | 0.675 | 47.8 |
| +3 | 0.169 | 0.788 | 50.7 |
| +4 | -0.004 | -0.021 | 51.5 |
| +5 | 0.123 | 0.572 | 49.3 |
| +10 | 0.277 | 1.292 | 56.6 |
| +15 | 0.186 | 0.868 | 52.9 |
| +20 | 0.149 | 0.696 | 54.8 |

Table 2 (Continued)

Panel B: Summary of Average Cumulative Abnormal Returns Over Different Event Windows

| Event Window | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative |
|--------------|---------------------------------|-------------|----------------------|
| [-10, 0] | 2.243 | 3.151*** | 55.1 |
| [-5, 0] | 3.098 | 5.892*** | 63.2*** |
| [-1, 0] | 1.708 | 5.627*** | 63.2*** |
| [+1, +5] | 1.531 | 3.189*** | 58.8** |
| [+1, +10] | 1.104 | 1.626 | 56.6 |
| [-1, +1] | 2.807 | 7.549*** | 69.1*** |
| [-5, +5] | 4.629 | 6.502*** | 72.8*** |
| [-10, +10] | 3.347 | 3.403*** | 58.8*** |

* Significant at the 0.10 level (two-tailed test).

** Significant at the 0.05 level (two-tailed test).

*** Significant at the 0.01 level (two-tailed test).

Table 3: Summary of Average Abnormal Returns and Average Cumulative Abnormal Returns by Type of Share Buy-back Announced During January 1989 - December 1998

Panel A: Summary of Abnormal Returns Over Days -20 to +20 Relative to the Announcement Day

| Event Day | On-Market Buy-backs (N=103) | | | Selective Buy-backs (N=16) | | | Other Buy-backs (N=17) ^a | | |
|-----------|------------------------------|----------------------|-------------|------------------------------|----------------------|-------------|-------------------------------------|----------------------|-------------|
| | Average Abnormal Returns (%) | Percent Non-Negative | t-Statistic | Average Abnormal Returns (%) | Percent Non-Negative | t-Statistic | Average Abnormal Returns (%) | Percent Non-Negative | t-Statistic |
| -20 | -0.082 | 49.0 | -0.368 | -1.291 | 25.0** | -1.551 | -0.030 | 25.9 | -0.045 |
| -15 | 0.344 | 54.4 | 1.539 | 0.200 | 43.8 | 0.240 | 0.418 | 64.7 | 0.623 |
| -10 | -0.263 | 46.6 | -1.178 | -0.556 | 62.5 | -0.668 | -0.471 | 35.3 | -0.702 |
| -5 | 0.495 | 59.2* | 2.217** | 0.864 | 62.5 | 1.038 | -0.594 | 47.1 | -0.886 |
| -4 | 0.412 | 59.2* | 1.846* | 0.602 | 68.8 | 0.724 | 1.277 | 58.8 | 1.905* |
| -3 | 0.286 | 56.3 | 1.281 | 0.572 | 56.3 | 0.688 | 0.591 | 52.9 | 0.882 |
| -2 | 0.043 | 52.4 | 0.191 | 0.533 | 68.8 | 0.641 | -0.064 | 70.6 | -0.096 |
| -1 | 0.594 | 58.3* | 2.658*** | -0.221 | 50.0 | -0.266 | 0.495 | 58.8 | 0.738 |
| 0 | 1.504 | 68.0*** | 6.735*** | 0.106 | 50.0 | 0.127 | 0.567 | 70.6 | 0.845 |
| +1 | 1.197 | 64.1*** | 5.361*** | 1.589 | 75.0** | 1.910* | 0.038 | 47.1 | 0.057 |
| +2 | 0.168 | 49.5 | 0.754 | 0.200 | 50.0 | 0.241 | -0.051 | 35.3 | -0.075 |
| +3 | 0.047 | 49.5 | 0.211 | -0.441 | 31.3 | -0.530 | 1.484 | 76.5** | 2.214** |
| +4 | 0.083 | 56.3 | 0.373 | -1.373 | 25.0** | -1.649* | 0.752 | 47.1 | 1.121 |
| +5 | 0.093 | 48.5 | 0.418 | -0.466 | 37.5 | -0.560 | 0.855 | 64.7 | 1.275 |
| +10 | 0.339 | 54.4 | 1.520 | 0.539 | 75.0** | 0.647 | -0.345 | 52.9 | -0.515 |
| +15 | 0.210 | 54.4 | 0.940 | -0.135 | 37.5 | -0.162 | 0.345 | 58.8 | 0.515 |
| +20 | 0.099 | 50.5 | 0.444 | 0.369 | 73.3* | 0.444 | 0.259 | 64.7 | 0.387 |

Table 3 (Continued)

Panel B: Summary of Average Cumulative Abnormal Returns Over Different Event Windows

| Event Window | On-Market Buy-backs (N=103) | | | Selective Buy-backs (N=16) | | | Other Buy-backs (N=17) ^a | | |
|--------------|---------------------------------|----------------------|----------------------|---------------------------------|-------------|----------------------|-------------------------------------|---------------------|----------------------|
| | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative |
| [-10, 0] | 2.531 | 3.417 ^{***} | 53.4 | 1.400 | 0.507 | 62.5 | 1.291 | 0.581 | 58.8 |
| [-5, 0] | 3.334 | 6.094 ^{***} | 61.2 ^{**} | 2.456 | 1.205 | 75.0 ^{**} | 2.272 | 1.384 | 64.7 |
| [-1, 0] | 2.098 | 6.642 ^{***} | 65.0 ^{***} | -0.116 | -0.098 | 43.8 | 1.061 | 1.120 | 70.6 |
| [+1, +5] | 1.589 | 3.183 ^{***} | 60.2 ^{**} | -0.490 | -0.264 | 37.5 | 3.077 | 2.053 [*] | 70.6 |
| [+1, +10] | 1.420 | 2.011 ^{**} | 58.3 [*] | -1.134 | -0.431 | 50.0 | 1.293 | 0.610 | 52.9 |
| [-1, +1] | 3.296 | 8.519 ^{***} | 69.9 ^{***} | 1.474 | 1.022 | 68.8 | 1.100 | 0.947 | 64.7 |
| [-5, +5] | 4.924 | 6.647 ^{***} | 72.8 ^{***} | 1.966 | 0.712 | 75.0 ^{**} | 5.349 | 2.406 ^{**} | 70.6 |
| [-10, +10] | 3.951 | 3.860 ^{***} | 58.3 ^{**} | 0.266 | 0.070 | 56.3 | 2.584 | 0.841 | 64.7 |

^a Other buy-backs include 6 Equal Access buy-backs, 7 Employee Share buy-backs and 4 Minimum holding buy-backs.^{*} Significant at the 0.10 level (two-tailed test).^{**} Significant at the 0.05 level (two-tailed test).^{***} Significant at the 0.01 level (two-tailed test).

Table 4: Summary of Abnormal Returns and Cumulative Abnormal Returns for Share Buy-backs Announced Before and After the 1995 Simplification Act

Panel A: Summary of Abnormal Returns Over Days -20 to +20 Relative to the Announcement Day

| Event Day | Before Simplification Act (N=32) | | | After Simplification Act (N=104) | | |
|-----------|----------------------------------|-------------|----------------------|----------------------------------|-------------|----------------------|
| | Average Abnormal Returns | t-Statistic | Percent Non-Negative | Average Abnormal Returns | t-Statistic | Percent Non-Negative |
| -20 | -0.409 | -0.759 | 41.4 | -0.169 | -0.767 | 48.1 |
| -15 | 0.225 | 0.417 | 56.3 | 0.370 | 1.686* | 53.8 |
| -10 | -0.072 | -0.133 | 59.4 | -0.401 | -1.825* | 43.3 |
| -5 | -0.181 | -0.336 | 56.3 | 0.582 | 2.650*** | 58.7* |
| -4 | 1.009 | 1.872* | 71.9** | 0.399 | 1.818* | 56.7 |
| -3 | 0.879 | 1.630 | 62.5 | 0.198 | 0.900 | 53.8 |
| -2 | 0.233 | 0.432 | 65.6* | 0.042 | 0.192 | 53.8 |
| -1 | 0.599 | 1.111 | 62.5 | 0.451 | 2.052** | 55.8 |
| 0 | 1.290 | 2.394** | 71.9** | 1.202 | 5.472*** | 64.4*** |
| +1 | 0.173 | 0.320 | 56.3 | 1.384 | 6.300*** | 65.4*** |
| +2 | -0.141 | -0.262 | 43.8 | 0.233 | 1.060 | 49.0 |
| +3 | 0.683 | 1.266 | 59.4 | 0.011 | 0.051 | 48.1 |
| +4 | -0.243 | -0.451 | 50.0 | 0.069 | 0.314 | 51.9 |
| +5 | -0.277 | -0.513 | 40.6 | 0.246 | 1.118 | 51.9 |
| +10 | 0.257 | 0.478 | 65.6* | 0.283 | 1.290 | 53.8 |
| +15 | -0.072 | -0.134 | 50.0 | 0.266 | 1.211 | 53.8 |
| +20 | 0.526 | 0.977 | 61.3 | 0.037 | 0.168 | 52.9 |

Table 4 (Continued)

Panel B: Summary of Average Cumulative Abnormal Returns Over Different Event Windows

| Event Window | Before Simplification Act (N=32) | | | After Simplification Act (N=104) | | |
|--------------|----------------------------------|-------------|----------------------|----------------------------------|-------------|----------------------|
| | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative |
| [-10, 0] | 2.220 | 1.242 | 50.0 | 2.250 | 3.089*** | 56.7 |
| [-5, 0] | 3.828 | 2.899*** | 81.3*** | 2.874 | 5.342*** | 57.7 |
| [-1, 0] | 1.889 | 2.478** | 68.8** | 1.652 | 5.320*** | 61.5** |
| [+1, +5] | 0.194 | 0.161 | 50.0 | 1.942 | 3.954*** | 61.5** |
| [+1, +10] | -0.173 | -0.102 | 53.1 | 1.497 | 2.155** | 57.7 |
| [-1, +1] | 2.061 | 2.208** | 71.9** | 3.036 | 7.981*** | 68.3*** |
| [-5, +5] | 4.022 | 2.250** | 75.0*** | 4.815 | 6.611*** | 72.1*** |
| [-10, +10] | 2.047 | 0.829 | 59.4 | 3.747 | 3.723*** | 58.7* |

* Significant at the 0.10 level (two-tailed test).

** Significant at the 0.05 level (two-tailed test).

*** Significant at the 0.01 level (two-tailed test).

Table 5: Summary of Abnormal Returns and Cumulative Abnormal Returns for On-Market Share Buy-backs Announced Before and After the 1995 Simplification Act

Panel A: Summary of Abnormal Returns Over Days -20 to +20 Relative to the Announcement Day

| Event Day | Before Simplification Act (N=13) | | | After Simplification Act (N=90) | | |
|-----------|----------------------------------|-------------|----------------------|---------------------------------|-------------|----------------------|
| | Average Abnormal Returns | t-Statistic | Percent Non-Negative | Average Abnormal Returns | t-Statistic | Percent Non-Negative |
| -20 | -0.374 | -0.602 | 40.0 | -0.050 | -0.214 | 50.0 |
| -15 | 0.277 | 0.447 | 53.8 | 0.353 | 1.513 | 54.4 |
| -10 | 0.189 | 0.304 | 69.2 | -0.328 | -1.406 | 43.3 |
| -5 | -0.087 | -0.140 | 53.8 | 0.579 | 2.481** | 60.0* |
| -4 | 0.741 | 1.194 | 76.9* | 0.365 | 1.563 | 56.7 |
| -3 | 0.718 | 1.158 | 61.5 | 0.224 | 0.958 | 55.6 |
| -2 | 0.333 | 0.537 | 53.8 | 0.001 | 0.003 | 52.2 |
| -1 | 1.128 | 1.819* | 69.2 | 0.516 | 2.212** | 56.7 |
| 0 | 2.308 | 3.720*** | 84.6** | 1.388 | 5.947*** | 65.6*** |
| +1 | 0.015 | 0.024 | 46.2 | 1.368 | 5.861*** | 66.7*** |
| +2 | -0.429 | -0.691 | 53.8 | 0.255 | 1.091 | 48.9 |
| +3 | 0.569 | 0.917 | 53.8 | -0.028 | -0.122 | 48.9 |
| +4 | -0.061 | -0.098 | 61.5 | 0.104 | 0.446 | 55.6 |
| +5 | -1.095 | -1.765 | 23.1* | 0.265 | 1.135 | 52.2 |
| +10 | 0.777 | 1.252 | 61.5 | 0.276 | 1.183 | 53.3 |
| +15 | 0.323 | 0.520 | 53.8 | 0.194 | 0.830 | 54.4 |
| +20 | 0.743 | 1.197 | 53.8 | 0.006 | 0.027 | 50.0 |

Table 5 (Continued)

Panel B: Summary of Average Cumulative Abnormal Returns Over Different Event Windows

| Event Window | Before Simplification Act (N=13) | | | After Simplification Act (N=90) | | |
|--------------|----------------------------------|----------------------|----------------------|---------------------------------|----------------------|----------------------|
| | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative |
| [-10, 0] | 3.428 | 1.666 | 46.2 | 2.402 | 3.102 ^{***} | 54.4 |
| [-5, 0] | 5.141 | 3.383 ^{***} | 84.6 ^{**} | 3.073 | 5.374 ^{***} | 57.8 |
| [-1, 0] | 3.436 | 3.917 ^{***} | 76.9 [*] | 1.905 | 5.769 ^{***} | 63.3 ^{**} |
| [+1, +5] | -1.001 | -0.722 | 46.2 | 1.964 | 3.762 ^{***} | 62.2 ^{**} |
| [+1, +10] | -1.251 | -0.638 | 38.5 | 1.806 | 2.446 ^{**} | 61.1 ^{**} |
| [-1, +1] | 3.451 | 3.212 ^{***} | 69.2 | 3.273 | 8.095 ^{***} | 70.0 ^{***} |
| [-5, +5] | 4.140 | 2.012 [*] | 69.2 | 5.037 | 6.505 ^{***} | 73.3 ^{***} |
| [-10, +10] | 2.177 | 0.766 | 53.8 | 4.208 | 3.933 ^{***} | 58.9 [*] |

* Significant at the 0.10 level (two-tailed test).

** Significant at the 0.05 level (two-tailed test).

*** Significant at the 0.01 level (two-tailed test).

Table 6: Summary of Average Abnormal Returns and Average Cumulative Abnormal Returns for Share Buy-backs by Industrial Classification Announced During January 1989 - December 1998

Panel A: Summary of Abnormal Returns Over Days -20 to +20 Relative to the Announcement Day

| Event Day | Industrial Buy-backs (N=79) | | | Financial Services Buy-backs (N=28) | | | Resource Buy-backs (N=29) | | |
|-----------|------------------------------|----------------------|-------------|-------------------------------------|----------------------|-------------|------------------------------|----------------------|-------------|
| | Average Abnormal Returns (%) | Percent Non-Negative | t-Statistic | Average Abnormal Returns (%) | Percent Non-Negative | t-Statistic | Average Abnormal Returns (%) | Percent Non-Negative | t-Statistic |
| -20 | 0.009 | 46.8 | 0.032 | -0.169 | 51.9 | -0.511 | -0.879 | 41.4 | -1.395 |
| -15 | 0.399 | 57.0 | 1.473 | 0.107 | 53.6 | 0.323 | 0.385 | 48.3 | 0.611 |
| -10 | -0.368 | 48.1 | -1.359 | -0.035 | 50.0 | -0.107 | -0.479 | 41.4 | -0.760 |
| -5 | 0.237 | 53.2 | 0.875 | 0.439 | 71.4* | 1.328 | 0.817 | 58.6 | 1.297 |
| -4 | 0.428 | 63.3** | 1.579 | 0.464 | 57.1 | 1.403 | 0.932 | 55.2 | 1.479 |
| -3 | 0.348 | 58.2 | 1.286 | -0.142 | 57.1*** | -0.431 | 0.867 | 48.3 | 1.376 |
| -2 | -0.089 | 49.4 | -0.329 | 0.656 | 78.6*** | 1.985* | 0.017 | 55.2 | 0.027 |
| -1 | 0.683 | 59.5* | 2.522** | 0.597 | 64.3 | 1.807* | -0.162 | 44.8 | -0.257 |
| 0 | 1.407 | 70.9*** | 5.190 | 0.969 | 67.9* | 2.931*** | 0.967 | 51.7 | 1.534 |
| +1 | 0.997 | 62.0** | 3.677*** | 0.213 | 57.1 | 0.646 | 2.231 | 72.4** | 3.541*** |
| +2 | -0.148 | 43.0 | -0.544 | 0.254 | 46.4 | 0.770 | 0.835 | 62.1 | 1.326 |
| +3 | 0.418 | 53.2 | 1.542 | -0.115 | 46.4 | -0.347 | -0.235 | 48.3 | -0.372 |
| +4 | 0.135 | 59.5* | 0.498 | 0.338 | 53.6 | 1.024 | -0.715 | 27.6** | -1.135 |
| +5 | 0.104 | 51.9 | 0.386 | -0.192 | 39.3 | -0.582 | 0.476 | 51.7 | 0.756 |
| +10 | 0.184 | 55.7 | 0.679 | 0.322 | 60.7 | 0.974 | 0.488 | 55.2 | 0.775 |
| +15 | 0.185 | 55.7 | 0.681 | 0.156 | 53.6 | 0.472 | 0.220 | 44.8 | 0.350 |
| +20 | 0.145 | 57.7 | 0.535 | -0.287 | 46.4 | -0.868 | 0.582 | 55.2 | 0.924 |

Table 6 (Continued)

Panel B: Summary of Average Cumulative Abnormal Returns Over Different Event Windows

| Event Window | Industrial Buy-backs (N=79) | | | Financial Services Buy-backs (N=28) | | | Resource Buy-backs (N=29) | | |
|--------------|---------------------------------|-------------|----------------------|-------------------------------------|-------------|----------------------|---------------------------------|-------------|----------------------|
| | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative | Cumulative Abnormal Returns (%) | t-Statistic | Percent Non-Negative |
| [-10, 0] | 1.531 | 1.703* | 51.9 | 2.539 | 2.316* | 60.7 | 3.897 | 1.865* | 58.6 |
| [-5, 0] | 3.014 | 4.541*** | 58.2 | 2.982 | 3.684*** | 85.7*** | 3.438 | 2.228** | 55.2 |
| [-1, 0] | 2.090 | 5.453*** | 64.6*** | 1.566 | 3.351*** | 75.0* | 0.805 | 0.903 | 48.3 |
| [+1, +5] | 1.506 | 2.486** | 57.0 | 0.499 | 0.676 | 53.6 | 2.593 | 1.841* | 69.0* |
| [+1, +10] | 0.875 | 1.021 | 58.2 | -0.400 | -0.383 | 57.1 | 3.179 | 1.596 | 51.7 |
| [-1, +1] | 3.087 | 6.575*** | 65.8*** | 1.780 | 3.109*** | 78.6*** | 3.036 | 2.782*** | 69.0* |
| [-5, +5] | 4.521 | 5.029*** | 68.4*** | 2.690 | 3.640*** | 85.7*** | 6.031 | 2.886*** | 79.3*** |
| [-10, +10] | 2.406 | 1.937* | 50.6 | 2.139 | 1.412 | 71.4* | 7.077 | 2.451** | 69.0* |

* Significant at the 0.10 level (two-tailed test).

** Significant at the 0.05 level (two-tailed test).

*** Significant at the 0.01 level (two-tailed test).