AUSTRALIAN CORPORATE DIVESTITURES:

A TEST OF EFFICIENCY *VERSUS* FINANCING HYPOTHESES

by

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Thesis submitted for the Degree of Doctor of Philosophy,
Graduate School of Management, University of Adelaide,
December, 1996

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ACKNOWLEDGEMENTS

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ABSTRACT

Previous empirical research documents an average two-day net of market equity return of between one and two per cent around voluntary sell-off announcements. Until recently, the positive abnormal returns accruing to stockholders were attributed to transfer of control rights over the divested assets to more efficient management, even if an asset sale were made for the stated intention of raising finance. Much of the earlier research failed to give adequate recognition to the motivation for asset sales, and the intended use of the sale proceeds in particular, and whether the divestiture is manager- or creditor- driven. When the results of recent research are pooled, a microstructure is revealed, wherein equity market responses are expected to vary according to circumstances and intention. In short, not all divestitures have the same information content or expected stockholder wealth effects.

Asset sales by financially distressed firms are a special case because these are expected to result in wealth gains for debtholders rather than stockholders, so are likely to result from creditor pressure and are not entirely voluntary. The stock price response has been found to be more positive when sell-offs are larger, focus-increasing and the sale price is disclosed, all of which suggest that the stockmarket may be responding to information signalled by the sell-off over and above the sale price itself. More recent research has focused on the role that agency conflicts within the firm have on the divestment decision. Specifically, evidence has been reported that stockholder gains are realised only when (non-distressed) selling firms pay out the sale proceeds, and that

reinvestment of sale proceeds is often not in stockholders' interest. Both regularities suggest the identity of the ultimate beneficiaries of divestiture gains depends on the extent to which the selling firm is subject to the agency cost of managerial discretion. This financing hypothesis is important because it challenges the standard view that competitive capital markets guarantee that divestitures are not made unless in stockholders' interest. Managers still have an incentive to accept a "good" price because they benefit directly. The same findings also suggest that agency problems are ubiquitous.

The financing role ascribed to divestitures is independent of asset sales for efficiency reasons. In other words, disposals to raise finance may be made at a price in excess of present value (efficiency), or not (due to agency problems). Recognition of the financing role of divestitures therefore does not require repudiation of the efficient redeployment argument. Rather, the question as to which of the two explanations dominates is an empirical matter. The primary aim of the present study is to address this question. Known distress sales are excluded. These are also made for financing purposes, but are creditor-driven because stockholders lose when assets are sold earlier than otherwise optimal.

The present study employs a matched seller-buyer design in order to track the subsequent financial performance of divested assets in the hands of the buyer. An improvement in performance over the first three years suggests an efficiency motive for a divestiture, while no improvement suggests the seller was the most efficient user. An

hierarchy of expected excess returns is then established given the payout/reinvest choice. Essentially, to receive empirical support, the financing hypothesis requires that reinvestment of sale proceeds when a sale is made to a less efficient buyer receives a negative market response, irrespective of whether the buyer overpaid or not: a windfall gain to self-interested managers is still bad news for their stockholders if the agency problem is severe enough.

A final sample of 85 Australian corporate divestitures for which matched sellers and buyers could be obtained and taking place between 1987 and 1993 is constructed in order to discriminate the competing efficiency and financing explanations. Direct tests of the competing hypotheses give limited support to an efficiency explanation, but offer scant support for a financing explanation. The capital market reaction to divestiture announcements suggests that many divestitures imply or may even signal a degree of financial distress, despite no clear signs of this in the financial ratios. A test of a model of the determinants of the payout/reinvest choice offers indirect evidence that distress sales in the present study are a sub-set of asset sales for efficiency, rather than financing, reasons. Concurrent divestiture-induced focus changes are found to add little extra explanatory power, which casts some doubt on the populist notion of a position relation between focus increases and efficiency.

CHAPTER ONE

MOTIVATION AND OBJECTIVES

1.1 INTRODUCTION

In comparison with corporate investment and acquisition decisions, voluntary

divestitures[1] have received comparatively little attention in the empirical finance

literature. In Australia, no database of divestiture activity is published, but the

aggregate value of divestitures by a sample of large Australian firms used in this

study suggests economic significance. Divestitures, or asset sales, for 1987 through

1993 totalled $29,149m, while at the same time the aggregate value of acquisitions

by the same firms averaged $71,103m.

Virtually all empirical studies of divestitures are event studies, which describe the

direction and magnitude of net-of-market equity returns of sellers around the first public

announcement of a divestiture. Net-of-market returns are computed using a standard

Capital Asset Pricing Model (CAPM), and are also referred to as abnormal or excess

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[1] The term divestitures as used here refers specifically to asset sales or disposals, which are also
referred to in the literature as sell-offs, sell-downs, or partial liquidations. An alternative usage
is for divestitures to embrace all firm down-sizing techniques, many of which do not involve
receiving consideration for transfer of control of the divested asset.

returns in relation to the expected return generated by this model[2]. Nearly all the divestitures studied are those of American firms made in the 1970s and 1980s. The findings are remarkably consistent. Stock-price reactions (or market responses) are generally positive, of the order of between 1 and 2 per cent over an event window of a few days around the announcement. Hite, Owers and Rogers (1987), together with most empirical researchers, attribute the announcement gains to improved efficiency when assets are transferred by sale into new or more efficient uses. A buyer can afford to bid a premium over the existing present value of the asset when in the hands of the seller because the asset is more valuable in its proposed use. The shareholders of the selling firm therefore gain whenever an asset is sold into a more highly-valued use. This view is characterised as the efficient deployment hypothesis, or more succinctly the *efficiency hypothesis*[3], and implies that managers only retain assets as long as they can be efficiently operated; otherwise, they are sold[4]. A positive stock-price reaction is therefore expected when asset sales are announced. Asset sales for financing reasons by firms in financial distress are also efficiency-driven, but are instigated by creditors rather than managers because the latter are not acting either in debtholders' or shareholders' interest by retaining assets that are more valuable to a buyer. The efficiency hypothesis

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[2] Net-of-market returns are also described more colloquially as stock-price reactions or, simply, market responses.

[3] The efficiency argument is also present in the corporate strategy literature. For example, Duhaime and Patton (1980) advocate divestment as a "normal strategic option" and not as a "defensive response to performance problems" (p. 46). The former case implies capital expenditure or acquisition before it is justifiable on net present value (NPV) grounds; that is, a return is contingent on the occurrence of some future event.

[4] Managers are full-time executive managers, and are differentiated from board members who are not, such as the chairman and any part-time or non-executive directors.

is silent with respect to the disposition of the sale proceeds, that is, whether the proceeds are reinvested or paid out (either to debtholders or shareholders)[5].

Until recently, the efficiency rationale for divestitures has not formally been challenged. Conjecture for the moment that managers are assumed to value control and large firm size, consistent with the earlier managerial theories of the firm[6], and have discretion in making decisions as agents for shareholders because they have more information about the firm than the shareholders (that is, information asymmetry). Such managers do not always exercise their discretion in shareholders' interest, and to that extent are self-interested. Managers therefore (a) do not sell assets for efficiency reasons alone, and (b) may not sell assets even when a bid received is higher than the present value (in the existing use).

All agency problems have one factor in common: they induce agency costs whereby managers transfer wealth from shareholders and/or debtholders to themselves. A good example is afforded by manager entrenchment practices. Managers invest in assets in which they have a comparative advantage, even if these investments have a lower present value than alternative investments which their shareholders would have preferred. Since agency problems reduce the wealth of claimholders, agency problems

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[5] Reinvestment is synonymous with retention.

[6] See, for instance, Marris (1964).

increase the cost of raising external finance from capital markets, thereby increasing the likelihood of asset sales for the purpose of raising finance.

When the price of external finance is high, managers have an incentive to sell assets for financing reasons. In their recent paper, Lang, Poulsen and Stulz (1995) (hereafter, LPS) characterise this motivation for asset sales as the *financing hypothesis*. Unlike the efficiency hypothesis, the financing hypothesis recognises that managers may value access to the sale proceeds. Given that self-interested managers have little incentive to sell at a price below present value, the financing hypothesis also implies positive abnormal returns when asset sales are announced, because a successful sale implies a sufficiently high sale price (or consideration) has been obtained. But, given positive costs of managerial discretion, retention of sale proceeds has a lower present value (to shareholders) than immediate payout because managers cannot extract rents once the proceeds are paid out. Thus, the equity market is expected to discount reinvestment relative to paying out sale proceeds (whether paid to shareholders or debtholders). Given agency problems, announcement of an asset sale with anticipated reinvestment of the sale proceeds has offsetting shareholder wealth effects, with a negative stock price response expected if the costs of managerial discretion are high enough. LPS report supporting evidence that the stock-price reaction to asset sales is positive for firms paying out their sale proceeds, but insignificantly different from zero for firms retaining the sale proceeds[7].

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[7] An implicit assumption is that in an informationally efficient capital market investors anticipate the disposition of sale proceeds at the same time the divestiture is announced.

In the absence of agency problems, even creditors are worse off if assets are sold at a price below present value because the present value already reflects any internal operating inefficiencies[8]. Hence, when efficiency arguments alone are employed, divestitures at prices below present value are not expected. However, in the presence of agency problems, both debtholders and shareholders can benefit from asset sales at prices below present value if the discount is less than the present value of the diminution in firm value resulting from the agency costs of managerial discretion. Debtholders have a stronger incentive than shareholders to force asset sales because their claim has no option value: their claims are contractually fixed, and do not participate in profits over and above the amount required to service or repay the debt. Thus, debtholders, unlike shareholders, lose no option value when an asset is sold.

Asset sales by firms in financial distress are a complicating factor. Financial distress is more difficult to define than bankruptcy[9]. Bankruptcy implies insolvency, which occurs when a firm cannot meet its debt obligations (either payment of interest or repayment of principal amounts) as they fall due. A distressed firm is one which is approaching this state, and may loosely be characterised as being in financial

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[8] This begs the broader question of how it is that an inefficient firm can survive, but this is possible when entry barriers, product differentiation and the like exist, such that a higher-than-competitive output price can be charged.

[9] Financial distress is suggested by a "low" interest coverage ratio, or short-term debt overhang which occurs when current period cash flow is insufficient to meet short-term liabilities brought forward from the previous period, or more directly by evidence of creditor pressure.

difficulties. Assets sales by distressed firms, or distress sales, are likely debtholder-driven because debtholders prefer asset sales if continued operations are incurring losses. In contrast, managers probably attach more value to continued operation to justify their rents, while shareholders lose any option value attaching to their claims when the firm sells assets. However, even creditors do not force distress sales at a price below present value, unless agency problems are present. Therefore, if agency problems are assumed pervasive, then (a) at least some distress sales will be made at a price below present value, and (b) the divestiture itself may even signal the state of financial distress, given information asymmetry. Hence, LPS exclude distress sales because such sales reflect the problems of distress as well as any agency problems (that may well have contributed to the distress).

The efficient deployment hypothesis should be an adequate explanation of divestitures by efficiently managed firms without agency problems, because these firms are expected to reinvest sale proceeds given their efficiency. Payouts are therefore not expected, and reinvestment should evoke a positive stock-price reaction. However, when agency problems exist, reinvestment is costly to shareholders and debtholders alike, so reinvestment should evoke a negative market response. The LPS finding of negative, but statistically insignificant, abnormal returns for reinvestment can be interpreted as suggesting that most of their sample was characterised by firms with agency problems.

In another recent paper, John and Ofek (1995) (hereafter, JO) attribute a large part of the positive abnormal equity returns observed on divestiture announcements to observed improvement in the operating performance (as measured by earnings) of sellers in the three years following focus-increasing divestitures. The latter are disposals of assets with activities (or lines of business) unrelated to sellers' main activities, which *ex post* are core activities. Some part of sellers' gain is also attributed to a "better" fit between the divested asset and the activities of the buyer. The positive stock-price reaction is observed at the time of sale, implying that the focus effect is regarded by the market as permanent: that is, the sale proceeds are not reinvested in unrelated activities.

It is possible to link the focus change findings of JO with both the efficiency and financing explanations of divestitures. On the one hand, firms with agency problems that retain their sale proceeds are more likely to invest in activities not preferred by their shareholders, including activities unrelated to core activities which presumably are profitable by virtue of the survivorship principle. In contrast, a positive market response could be driven by payout firms increasing their focus by divesting unrelated activities.

1.2 RESEARCH OBJECTIVES

Previous research on divestitures have been examined from the perspectives of managerial theories of the firm, corporate strategy and industrial organisation, as

well as financial economics. Managerial perspectives emphasise the process of divestiture as part of managers' search for a preferred corporate structure[10], corporate strategy prescribes divestiture when activities no longer "fit" with "core" activities, and industrial organisation focuses on the relation between market structures and public policy[11]. Shareholder wealth effects do not occupy a central role in industrial organisation because wider public policy issues are addressed, and as a consequence the modelling tools of financial economics, *viz.*, shareholder wealth maximisation and public-information efficiency of capital markets, are uncommon arguments. This thesis focuses on the shareholder wealth consequences of divestiture decisions at a firm or micro level. Consequently, the paradigm of enquiry is that of financial economics. Factors associated with divestiture decisions are examined to the extent of their impact on shareholder wealth. The divestiture decision *per se* is not modelled, nor is the process of divestiture.

The primary aim of the thesis is to test the competing efficiency and financing hypotheses. This is done by identifying buyer efficiency relative to the seller's, relating this relative efficiency to the payout/reinvest choice, and analysing the differences in stock price response between the groups. By this design it is possible

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[10] The managerial literature, insofar as it relates to corporate restructuring, is summarised in Coyne and Wright (1986, ch. 1). Contributions include Duhaime and Grant (1984), Wright (1985) and Wright and Thompson (1987). Strategy and policy perspectives are canvassed in Wright, Chiplin and Coyne (1989).

[11] An exhaustive study in the industrial organisation paradigm is that of Ravenscraft and Scherer (1987), who identify acquisitions made in the 1960s and track those eventually sold off between 1974 and 1981.

to check if differences in payout/reinvest stock price responses are explained by underlying differences in relative efficiency. To determine relative buyer efficiency, the profit contributions of divested assets are tracked for some years before and after disposal. Since the innate riskiness of the divested asset is unchanged, there is no need to use risk-adjusted returns. Payouts in circumstances suggesting efficient redeployment (that is, buyers are relatively more efficient) should not have a stock price response significantly different from retention, but if LPS are right should attract a more positive market response when buyers are relatively less efficient. Payouts by sellers when buyers are relative less efficient suggest a financing motive, and are expected to occur more frequently than payouts by sellers when buyers are relatively more efficient because efficient redeployment does not suggest a need for payout. Since these competing hypotheses have not hitherto been tested, this is the primary contribution of this thesis to the research literature.

A subsidiary objective is to test whether differences in stock price responses between payout and reinvest firms are driven also by differences in the direction of focus change induced by divestiture. In the process, an attempt is made to replicate the main empirical regularities documented by JO on Australian data. This entails an examination of the impact of divestiture-induced focus changes on shareholder wealth, and on seller characteristics.

Other aspects of voluntary divestitures unrelated to these objectives are not examined. Since the primary interest is in the use of divestment proceeds and focus effects induced

by divestitures, other perspectives are not pursued here. These include shareholder

wealth effects in relation to: intended asset sales before a buyer is found[12], divestiture

announcements that do not proceed[13], divestitures of acquired assets[14], life-cycle

stages of divested assets[15], the impact of executive compensation on divestiture rates[16],

the influence of managerial ownership[17], the timing of asset sales[18], stated reasons[19]

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[12] See Klein (1986) and Afshar, Taffler and Sudarsanam (1992, pp. 119, 127-130).

[13] See Hearth and Zaima (1986) and Hite, Owers and Rogers (1987).

[14] This area is controversial. Porter (1987) infers mistakes from the divestiture of a majority of acquired firms in the United States from 1950 through 1986. Weston (1989) challenges this conclusion. The evidence is mixed: Kaplan and Weisbach (1992) document evidence against the Porter position, while Cornett and Varaiya (1992), whose sample is confined to conglomerate acquirers, provide supporting evidence.

[15] See Pashley and Philippatos (1993).

[16] See Tehranian, Travlos and Wargelein (1987), who examine the impact on shareholder returns of long-term performance-based compensation plans.

[17] Sicherman and Pettway (1987) and Hirschey and Zaima (1989) document higher abnormal returns around divestiture announcements by firms with high managerial ownership of equity compared with firms having low managerial ownership. Sicherman and Pettway (1987) also find that firms with high managerial ownership make acquisitions with higher product-line relatedness than firms with low managerial ownership. However, Morck, Shleifer and Vishny (1988) report evidence that managerial ownership has opposite effects on firm value at very low and very high ownership levels, so an accurate measure of managerial ownership of equity is critical. This is difficult using Australian data because beneficial interests in outstanding stock tend to be low, and the control implications of crucial nominee and trustee holdings are so company-specific that a judgment is often arbitrary.

[18] Bartov (1993) analyses the timing of asset sales from the perspective of earnings management, while Rosser (1993) tests for an association between some asset sales and tax loss selling just before fiscal year-end.

[19] See, for example, Datta and Iskandar-Datta (1996), Hearth and Zaima (1984) and Linn and Rozeff (1984). LPS (p. 8) note that disclosed reasons often do not fit with subsequent actions: "In some cases, they sell assets explicitly to reduce debt. In other cases, they give other reasons to sell assets, but still pay out the proceeds"; and again (p. 9): "... many companies seem to sell assets while engaged in a program of acquisitions so that the asset sales provide cash for these

(apart from those associated with liquidity or intended use of the sale proceeds), and

concurrent disclosure of the sale price[20]. Concurrent effects on bondholder wealth are

not pursued[21]. Other forms of divestiture, including spin-offs[22], management (or

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programs, even though management may motivate the asset sale using different considerations, such as eliminating unprofitable divisions or focusing on core activities".

[20] See Linn and Rozeff (1984, p. 22), Klein (1986) and Afshar, Taffler and Sudarsanam (1992, especially pp. 125-130). All report larger and significantly positive (cumulative) abnormal returns when the sales price is concurrently disclosed. Klein (1986, pp. 688-9) recognises the possibility that sell-offs accompanied by disclosure of the sale price may also convey information about the value of unsold assets and/or future investment strategies if investors assume reinvestment. Vetsuypens (1985, p. 42) challenges the null hypotheses of both Klein and Linn and Rozeff on the grounds that a zero price reaction is also expected when a transaction is immaterial. Hence, disclosure of the sale consideration may proxy for the materiality of the transaction. Non-disclosure may simply reflect immateriality, rather than sellers withholding information.

[21] Datta and Iskandar-Datta (1996) document that bondholders and shareholders gain from sell-offs, but bondholders are the sole beneficiaries when financially-distressed firms report asset sales, while sell-offs made as a defence against takeovers are value-destroying for both bondholders and shareholders. Vetsuypens (1985, pp. 61-92) tests an asset substitution hypothesis whereby shareholders expropriate wealth from debtholders by selling off less risky assets than those retained, but reports no evidence of a decline in bond values which is expected if bondholders did not anticipate such divestitures. Galai and Masulis (1976) also suggest that divestitures may reduce the value of assets backing outstanding debt. Denning (1988) reports increased post-divestiture variance in raw and market-adjusted equity returns only for loss-making firms. No variance changes in either shareholder or debtholder returns are detected by Denning and Shastri (1990). As Denning (1988, *fn.* 5) points out, sell-offs for cash result in substitution of a riskless asset for a risky one, so firm risk is not expected to increase, at least in comparison with spin-offs which involve no cash flow. However, Hite and Owers (1983) find little evidence of debtholder appropriation in association with spin-offs.

[22] In a spin-off (or de-merger), an independent company is created to acquire the assets being disposed of and shares in the new company are distributed among the existing shareholders on a *pro rata* basis, so there is no cash flow to the parent company. The major studies are those by Hite and Owers (1983), Miles and Rosenfeld (1983), Schipper and Smith (1983) and Rosenfeld (1984), all of whom document gains to the shareholders of spinning-off firms. Rosenfeld (1984) reports that spin-offs outperformed sell-offs on the announcement date. As noted by Afshar, Taffler and Sudarsanam (1992, fn. 2), spin-offs are rare relative to sell-offs.

leveraged) buyouts[23], and full liquidations[24] (whether of a solvent firm or otherwise) are beyond the scope of this study.

Analytical perspectives are called upon as necessary in hypothesis formation and interpretation of results, but at least three approaches to analysing the divestiture decision are not adopted. The first model, and by far the most common encountered, is that of the divestiture decision as an exercise of a put option[25]. The put option is granted at the time the asset is acquired or created through internal investment, and the value received on abandonment is the exercise price. Option models rely on knowledge of the standard deviation of returns of the underlying asset, and are therefore difficult to apply to divestments of real assets because the volatility of their returns, as distinct from those of the selling firm's equity, is difficult to ascertain. Moreover, the term to expiry and the resale value are usually not independent of one another. In any event, an option pricing framework does not facilitate resolution of the research questions addressed in this thesis.

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[23] In a management buyout, the firm's managers purchase equity from the shareholders, often with the aid of large amounts of debt. Wealth consequences are analysed by DeAngelo, DeAngelo and Rice (1984) and Hite and Vetsuypens (1989).

[24] Hite, Owers and Rogers (1987, pp. 246-250) examine voluntary liquidations as well as sell-offs using the same research design, which effectively allows calibration of one set of results against the other. Kim and Schatzberg (1987) also examine voluntary liquidations.

[25] See any standard textbook in finance; for example, Brearley and Myers (1991, pp. 514-521).

A second approach is suggested by Boot (1992), who conjectures that divestitures

are delayed by managers when an asset sales signals a past mistake (for instance, a

negative present value investment). Hence, an intention to sell assets is "bad news",

whereas the actual sale signals "good news" because a buyer for the incompatible

asset has been found (at a price greater than present value in the seller's hands).

Therefore, a negative market response is predicted at the time the intention is

announced, or during the pre-execution period if no intention is signalled. A

positive response is predicted on execution, or earlier if the probability of a

successful completion of the disposal is high, and anticipated. The positive response

is predicted notwithstanding earlier delays in finding a buyer. In short,

announcements of completed asset sales are expected to attract positive market

responses, even when incompatibility or relative seller inefficiency are high[26].

However, although Boot's (1992) model provides interesting insights, the timing

aspect (which is critical) cannot be measured because the opportunities for

continued use are not observable.

Yet another approach employs notions from portfolio theory[27]. Extending the

arguments of Amihud and Lev (1981) to divestitures, Steiner (1994) argues that

sell-offs reduce firms' diversification and hence increase the risks borne by managers

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[26] Indirect support for this notion is found in both Alexander, Benson and Kampmeyer (1984) and Jain (1985), where announcement of an actual divestiture is found to meet with a positive market response, but is preceded by a period of generally abnormal negative responses, during which time management's intention to sell presumably becomes known.

[27] Portfolio theory was originated by Markowitz (1959).

(whose wealth portfolios are also less than fully diversified) on personal account. Since sell-offs reduce diversification, firms with a high directors' equity interest are therefore expected to have a low sell-off rate. Directors' equity ownership is therefore hypothesised to be negatively related to the likelihood of asset sales (for which limited empirical support is reported). However, the risk-reduction motivation of Steiner's model is arbitrary: risk reduction *per se* may be too costly to follow if the returns sacrificed are sufficiently high. Further, if firms hold poorly diversified (but high yielding) asset portfolios, it is not clear whether a sell-off increases or decreases total portfolio risk.

1.3   DOMAIN OF ENQUIRY AND DATA

The analysis is restricted to voluntary divestitures of operating businesses, irrespective of whether all or part of the equity is sold. In Australia, divestitures are typically effected by disposal of equity in an operation, rather than by direct sale of title in specific assets. Most divestitures are of all or part of the equity in controlled entities (comprising subsidiary and associate companies), while some are of significant equity parcels short of a controlling interest. Even a small equity interest in a large firm can be material if the investor firm is sufficiently smaller than the investee. Divestitures of dormant businesses and capital stock (such as land) are therefore excluded. Asset sales ordained by regulatory authorities to satisfy industry

concentration limits or equity ownership constraints are also excluded[28], as are asset

sales in situations of financial distress or bankruptcy because these are likely

creditor-driven[29]. Sell-offs of valuable assets in anticipation of hostile takeover bids

also reflect agency problems, but are excluded from the study to maintain sample

homogeneity[30]. However, divestitures for the purpose of raising funds are included,

even if the firm subsequently failed or was taken over, or had been in financial

distress[31]. Any simultaneous debt restructuring accompanying asset sales is not

examined beyond establishing the use to which sale proceeds are put[32]. Disposals

within a corporate group, such as a sale of one controlled entity to another, are not

counted.

This study could not be performed using United States (U.S.) or United Kingdom

(U.K.) data because the financial performance of controlled entities is not disclosed

in those countries. The *Corporations Law* in Australia requires disclosure of profit

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28 Examples of the impact on shareholder wealth of involuntary divestitures resulting from anti-trust policy in the United States are Eckbo (1983), Stillman (1983) and Weir (1983).

29 A recent example is Brown, James and Mooradian (1994).

30 Shareholder wealth effects of asset sales in anticipation of a hostile bid are examined by Dann and DeAngelo (1988).

31 The financial condition of the seller is examined by Hearth and Zaima (1984, pp. 14-15) and Afshar, Taffler and Sudarsanam (1992, pp. 130-133). Both report increasingly positive abnormal returns as the financial condition of divesting firms is stronger.

32 Divestitures are invariably a component of broader debt and asset restructuring programmes, often following poor performance. Asset restructuring usually involves a programme of acquisitions or mergers as well as divestitures. Zantout (1994) reports an empirical analysis of financial performance and stock-price reactions to asset/debt restructuring.

contributions from material investments in subsidiary and associate companies, so the earnings record of a divested asset can be tracked through the annual reports of the selling and buying firm. In general, financial data are collected from company annual reports, while the data for net-of-market returns are obtained from the Australian Stock Exchange (ASX) (stock prices) and market indexes (the return on the market).

1.4 RESEARCH METHOD

Shareholder wealth effects are measured by accumulating daily abnormal (or excess) equity returns during event windows around divestiture announcements[33]. Although event studies dominate the empirical divestiture literature, it is important to realise its limitations. A major limitation is that only shareholder wealth effects are considered. The value of debt claims and social welfare consequences, which may move in the opposite direction to shareholder wealth changes, are ignored. However, this limitation is of little consequence as long as the domain of argument is confined to shareholders' interest, which is the objective function of finance. Apart from the statistical problems involved in isolating abnormal returns[34], another problem pointed out by Halpern (1983) is that gains and losses accruing to

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[33] Thus, abnormal returns for event windows of two or more days are cumulative, and this is understood in subsequent discussion of observed returns.

[34] See, for example, Brown and Warner (1980).

shareholders do not signify the sources of these wealth changes. However, as in the present study, this problem can be ameliorated by sample partitioning. Hite (1986) also points to inherent selection biases in using the financial press for associated disclosures and identifying earliest public announcement dates, while Wright, Chiplin and Coyne (1989, p. 129) suggest that divestiture announcements contain a greater surprise element than acquisition announcements because less information is disclosed by selling firms in relation to their subsidiaries before divestment compared with listed companies receiving a takeover bid. However, this argument assumes that capital markets are dependent on firms' disclosures for their information. Despite evidence of some anomalies, chiefly for small firms and seasonalities, a large body of evidence suggests that equity markets assimilate public information quickly and without bias[35]. Furthermore, concurrent disclosures at the time a divestiture is announced (including the sale price, terms of sale and the intended use of the sale proceeds) reduce any informational asymmetry about the divested asset, and possibly also the firm's other assets to the extent there are factors in common with the divested asset.

1.5   ORGANISATION OF THESIS

The thesis is planned as follows. The literature review is spread across Chapters Two through Four. The review is confined to the literature relevant to the stated

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[35] Evidence for U.S. equity markets is summarised in Elton and Gruber (1995, ch. 17), and for Australia in Peirson, Bird, Brown and Howard (1995, ch. 14).

objectives, and then from the perspective of the issues addressed by this thesis. Chapter Two reviews the efficiency rationale for divestitures and surveys the evidence concerning stock price responses to voluntary divestiture announcements in situations relevant to the present enquiry. Divestitures by financially-distressed firms are seen as a special case of efficient redeployment, but triggered by creditors rather than managers when agency costs are present. Evidence not supportive of an efficiency explanation is also reviewed: this is found to emanate mainly from studies of divestitures that are small relative to the equity value of the seller. Chapter Three reviews agency arguments employed in the analytical models of Boot (1992) and Shleifer and Vishny (1989), as a precursor to examining the arguments of the financing hypothesis, which assumes economically significant agency problems. The financing hypothesis is examined in Chapter Four, and is differentiated from asset sales which signalling a poorer-than-expected financial condition of the seller. Expectations on other variables, such as the relative size of divestitures, are also established. Competing efficiency-based and financing-based hypotheses are formulated in Chapter Five, where a set of hypotheses relating focus change arguments to efficiency arguments is also formed. The sample, data and measures are described in Chapter Six. Efficiency and financing hypotheses are best discriminated by setting up a sample in which seller and buyer characteristics for the same divested asset are matched. A matched seller-buyer sample permits direct measurement of the performance of the divested asset in the hands of the seller relative to the buyer, or relative seller efficiency, to which other variables including abnormal returns may be related. The sample is also selected to ensure a full range

of relative divestiture size, in order to minimise the risk that relatively large divestitures signal firm prospects or related factors as well as efficiency and financing factors. The set of controls applied in this study to sample design and selection are unique in the empirical literature.

Extensive descriptive statistics are presented in Chapter Seven. Particular attention is devoted to the likelihood of inclusion of distress sales in the sample, and also the relative size of the sampled divestitures. Seller, sale and buyer characteristics are documented, as is the association between abnormal returns for long and short announcement windows and selected financial characteristics. All but one of the hypotheses are tested in Chapter Eight, which presents the key tests of the competing efficiency and financing explanations. Models of the determinants of abnormal returns on divestiture announcements are also tested in order to estimate the relative importance of exogenous factors, such as divestiture-induced focus changes. Finally, the empirical findings are summarised in Chapter Nine, where the conclusions are stated.

1.6   CHAPTER SUMMARY

This Chapter has provided the motivation for and domain of argument of the present study. The motivation is to determine empirically whether voluntary corporate divestitures exhibit characteristics that are compatible with either the efficient

redeployment hypothesis or the competing financing hypothesis. The domain of reasoning is established by excluding other theoretical perspectives that are not relevant for the stated purpose. A matched seller-buyer sample design is indicated to be an appropriate method for determining whether observed net-of-market returns are more consistent with one or the other competing explanations.

CHAPTER TWO

EFFICIENCY RATIONALE FOR DIVESTITURES

- THEORY AND EVIDENCE

2.1   INTRODUCTION

This Chapter reviews the received theory of divestiture activity, namely, the efficiency

rationale. In principle, variations in stock price reactions according to differences in

relative divestiture size, concurrent disclosures, acquisition of the divested asset and the

like can be attributed to either an efficiency or a financing rationale. For instance, large

divestitures relative to the size of the seller suggest no less an efficiency motive than

smaller divestitures, but the larger size of a divestiture may (or may not) signal

information about the financial condition of the seller. In the positive case, LPS would

argue that payout is likely. Similarly, the actual efficiency of a buyer in relation to the

seller is unaffected by any concurrent disclosures made by either side, although such

disclosures may convey information about the degree of the efficiency improvement or

reasons for (say) the seller's poor performance, such as agency problems. The review of

the literature leading to or compatible with the competing financing hypothesis is

deferred until the next Chapter.

2.2 THE PROCESS OF DIVESTITURE

Sicherman and Pettway (1992, p. 120) and Jain (1985) alone remark that (in the United States) sellers typically (a) initiate transactions, and (b) appear not to seek competitive bids. Both practices suggest agency problems, which of course supports the LPS view that agency problems are potentially significant enough to outweigh efficiency considerations. In case (a), given that buyers have an information advantage concerning their own operations, one would expect asset sales to more efficient buyers to be buyer-initiated, while case (b) suggests some urgency, perhaps to raise cash. Both regularities suggest a lower sale price than otherwise would obtain. In case (a), seller-initiated enquiries may signal their willingness to accept a lower price, while in case (b) the most efficient buyer may be excluded if the seller is unaware of the most valuable alternative uses of the asset being divested. A lower sale price does not affect the purpose or design of this study because this outcome is consistent with the impact of agency problems.

In any event, an absence of a public sale does not necessarily suggest an absence of a bidding process, or auction, where an asset is sold to the highest bidder, who should also be the most efficient user (but could also be overpaying through the "winner's curse"). If the seller has information on which buyer is likely to make the highest bid, then a similar outcome is achieved. Further, buyers presumably also make bids that are equally unobservable, and which are unanticipated by owners. Moreover,

given capital market efficiency[1], the identity of the initiating party should ultimately

not be important because no bidder is expected to bid above present value to the

buyer, and no seller is expected to sell at a price below a competing bid.

2.3   THE EFFICIENCY ARGUMENT

In the absence of agency problems, and assuming zero information costs and

perfectly competitive markets generally, a zero stock price response to a divestiture

is expected because the asset is sold for its present value. Hence, assets cannot be

redeployed to more efficient uses, and asset sales do not impact on shareholder

wealth, either for buyers or sellers.[2,3] This equilibrium is sometimes described as

the "no effects" hypothesis. The efficiency rationale does not take into account

agency problems within firms that may impede the efficient redeployment of assets.

No size effect is postulated. When the assumptions do not hold, divestitures at sale

prices that are large relative to the seller's equity value prior to the divestiture have

more potential to move the stock price. Relatively large divestitures also have a

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[1] The notion of informational efficiency of equity markets with respect to rapid assimilation of public information in security prices is a well-established theorem that has received wide, but not unanimous, empirical support. a comprehensive review of the theory is given in Fama (1991), and Australian evidence is presented in Ball, Brown, Finn and Officer (1989).

[2] See Rubinstein (1973, p. 175).

[3] Note that the value additivity principle implies all information is public.

higher propensity to signal other information about the firm. A significantly positive association between the relative size of a divestiture and the stock price response is reported by Hearth and Zaima (1984), Klein (1986), and Afshar, Taffler and Sudarsanam (1992), but Klein (1986, p. 690) notes that only sell-offs at least as large as ten per cent of the divesting firm's equity have significance.

When an equilibrium is disturbed (for instance, by unexpected shifts in product demand or technology[4]), assets are transferred (that is, sold into) to more efficient uses as buyers bid more than assets are worth to sellers, resulting in a new equilibrium.[5, 6] Sellers therefore share some of the value created by buyers, and the transaction price signals the higher value of the asset to the buyer. This scenario generates the efficient deployment (or efficiency) hypothesis[7]. A corollary is that sale proceeds are paid out to shareholders when they cannot profitably be employed within the firm. Since dividends imply firm down-sizing, the value of outstanding debt is reduced because debtholders have recourse against fewer assets.

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[4] See Gort (1969).

[5] Ownership of an asset implies a put option to sell or abandon the asset when the present value of future operating returns falls below the asset's value in the secondary market. The latter is the exercise price, which may not be independent of the present value when the asset's current and proposed uses are in related industries. For an elaboration of abandonment decisions as put options, see Brealey and Myers (1991, pp. 514-521). Cheung (1990) offers an advanced treatment.

[6] In the absence of valuable growth options, worth is synonymous with present value.

[7] Hearth and Zaima (1994, pp. 11-12) more formally derive the "no effects" and efficiency hypotheses.

If transaction costs are low and assets are readily redeployable in alternative uses, then asset liquidity is high, so buyers offer a reduced premium relative to more illiquid assets. The likelihood of wealth gains to sellers is therefore decreasing in the liquidity of the divested asset[8]. Transaction and agency costs create a degree of market illiquidity because they impede efficiency-enhancing asset transfers[9]. These costs also explain why assets having negative complementarities (or negative synergies) with a firm's other assets are not sold-off when optimal[10], and even in some circumstances why divestitures may occur at sale prices below present value.

2.3.1   A DIGRESSION ON FINANCIALLY-DISTRESSED SELLERS

In general, asset sales below present value to the seller, which generate negative abnormal returns on announcement in an efficient capital market, are not expected. However, several potential exceptions have been noted. Gilson (1989) argues that in conditions of advanced financial distress[11], managers who bear a high personal

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[8] See Williamson (1988). Shleifer and Vishny (1992) extend the analysis by modelling adverse selection costs as a determinant of asset liquidity. Buyers risk adverse selection when information costs inhibit buyers from distinguishing low- from high-quality assets; adverse selection becomes costly when buyers discount the value of high-quality assets for the risk that they are low quality (see Akerlof (1970)).

[9] Agency costs of equity and debt are identified and modelled by Jensen and Meckling (1976).

[10] A negative complementarity exists when the present value of a portfolio or combination of two assets is lower than the sum of the present values of the two assets operated separately.

[11] The nature of financial distress is discussed at length in Bishop, Crapp, Faff and Twite (1993, pp. 402-404). Essentially, financial distress means that a firm has difficulty in meeting

cost of firm bankruptcy may sell assets at a loss to avoid this outcome. As managers' personal cost of bankruptcy increases, the size of the negative change in a firm's financial condition required to trigger divestiture becomes smaller. Managers may also lose control *via* a hostile takeover as well as through bankruptcy. Thus, Sicherman and Pettway (1992, p. 120) remark that firms subject to takeover threat may dispose of their "crown jewels" (that is, the firm's most valuable assets) for a price below present value. Alternatively, while creditor pressure may well promote sale of assets into higher-valued uses[12], self-interested creditors may also force financially-distressed firms to sell assets below their present value. Diamond (1993) conjectures that this will occur if a portion of the value of the assets sold consists of non-transferable control rights not available to creditors: for instance, valuable growth opportunities contingent on assets in place.

In their general equilibrium model, Shleifer and Vishny (1992) recognise the possibility of asset sales at prices below value in current use. The liquidity of asset markets varies with the operating performance of firms within the industry, so the discount that sellers need to offer to effect a disposal falls as liquidity increases[13]. However, in depression, an entire industry may be credit-constrained, so firms

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obligations as they fall due, and at the same time has difficulty in raising finance for the purpose from capital markets.

[12] This is termed "efficient down-sizing" by Jensen (1989).

[13] Hence, gains to sellers on disposal are expected to vary directly with the profitability of other firms within the same industry.

attempting to raise cash are forced to sell to industry outsiders. The constraint takes

the form of debt overhang[14], which prevents those firms from having access to

capital markets. The outside buyers impose a large discount because they (i) are less

efficient users of the asset, which is already in its most efficient use, and (ii) also face

the risk of adverse selection because their information costs are higher than buyers'

in the same industry. Assets are therefore sold below their present value to industry

outsiders who do not suffer debt overhang[15]. As a consequence, *negative* abnormal

returns are predicted for sellers.

Wright, Chiplin and Coyne (1989, p. 118) raise the interesting possibility that firms

with "serious financial problems" may be forced by creditors to sell highly profitable

activities or subsidiaries, rather than poor performers, in order to "protect" the

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[14] Short-term debt overhang implies that the current-period cash flow is insufficient to meet outstanding current liabilities.

[15] Shleifer and Vishny (1992, especially p. 1359) generate further propositions. When a firm sells assets that are valuable, but do not generate current cash flow, it can relieve its debt burden without sacrificing its current income, or its ability to service other debt in the near future. Such assets might include businesses that are temporarily losing money, as well as growth businesses. If the industry buyers are themselves credit constrained, assets with high fundamental values but low current cash flows would sell at the largest discounts to their values; they would be the least liquid. By further assuming that credit constraints are tightest on liquidating firms, it still pays to sell these assets (even at deep discounts) because bankruptcy can be avoided both now and in the near future. By corollary, buyers need to have lower than average debt levels in order to take on an asset with low or zero collateral value. A wider spread in debt levels between a buyer and seller of the same asset therefore suggests a higher probability that the asset bought/sold is either a growth opportunity or a poorly-performing asset (an incompatible asset in Boot's (1992) terminology). Since inefficient firms (that is, firms to which lenders are likely to have applied short-term debt overhang) sell both incompatible and compatible assets, their divestiture rates *should* be higher than the divestiture rates of efficient firms (or firms without debt overhang), which sell only incompatible assets. However, inefficient firms retain poorly-performing assets longer than is optimal for their shareholders, so inefficient firms are expected to have lower divestiture rates than efficient firms.

firm's core activities. Such an outcome is not unexpected because it is in debtholders' interests to secure the borrowers' most valuable assets (especially in a recession) as collateral. However, the suggestion that core activities are protected is doubtful (especially in the longer term) because retention of poorly performing assets increases the risk of default or of a hostile takeover bid as the firm's stock price declines. In any event, expectations formed on divestment decisions of financially-distressed firms are beyond the scope of this study.

2.4 THE EMPIRICAL EVIDENCE IN SUPPORT OF EFFICIENCY

Apart from anecdotal evidence, there is no extant Australian evidence on the valuation effects of voluntary corporate divestitures. In contrast, a considerable body of evidence from the United States plus one United Kingdom study using data mostly from the 1970s and 1980s indicate that, on average, divestitures result in small, positive abnormal equity returns. These stock price gains occurred at a time when many divestitures were made by conglomerate firms in order to become more specialised (see Bhagat, Shleifer and Vishny (1990)), so it is possible to attribute the stock price gains to focus increases. Focus increases suggest an efficiency rationale for divestitures, but may also be compatible with a financing argument to the extent that managers raise finance from the sale of assets that have become ineffective entrenching vehicles, and increase focus in entrenching assets at the same time. Comment and Jarrell (1995) report that current- and prior-year stock returns over a

rolling ten-year period for about 2,000 firms are strongly and positively associated with all three measures of focus increase employed, which comprised segment, Standard Industry Classification (SIC) and Herfindahl index changes. Curiously, however, the relationship was not found for focus changes induced by divestitures. This empirical regularity is further explored in the present study.

More specifically, significantly positive abnormal returns for event windows around announcements of successful (that is, completed[16]) voluntary divestitures have been documented by Hearth and Zaima (1984), Rosenfeld (1984), Linn and Rozeff (1984), Jain (1985), Zaima and Hearth (1985), Klein (1986), Hite, Owers and Rogers (1987), Afshar, Taffler and Sudarsanam (1992), Cornett and Varaiya (1992)[17] and LPS[18]. The findings of all except Linn and Rozeff (1984), Zaima and Hearth (1985) and the last three studies are summarised in Denning and Shastri (1990), who document the samples, return measures, event windows, the wealth gain to the seller's shareholders and its significance. Since the excluded studies arrive at similar conclusions, an updated summary is not presented here. All these studies use variants of cumulative average residual returns using daily share price

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[16] A completed sale is one in which contracts have been signed, and the sale is known to have proceeded, *ex post*.

[17] Cornett and Varaiya (1992) restrict their analysis to acquisitions and divestitures of conglomerate firms.

[18] An event study by Montgomery, Thomas and Kamath (1984) using monthly abnormal returns is not reviewed because the announcement window of two years is too long to permit divestiture-specific inferences.

data. For event windows ending with or straddling the announcement date, cumulative average abnormal returns range from 0.17% to 3.55% for a two-day window [from day -1 to the day of announcement, 0] and a ten-day window [-5, 5], respectively[19]. By comparison, these gains are generally lower than the stock price gains accruing to target shareholders following successful takeover or merger bids. Hite, Owers and Rogers (1987, p. 245) note that takeover bids are approximately four times more profitable to target companies than sell-offs, which they attribute to the larger size of full takeover bids. Rosenfeld (1984, pp. 1441-1445) reports that wealth gains for spin-offs appear to average about twice the gains reported for sell-offs, but interpretation is difficult because in contrast to spin-offs, asset sales result in a cash flow, which may or may not signal the need for cash, or the seller's financial condition.

All these event studies attribute sellers' gains to improved efficiency of divested assets in the hands of buyers *vis à vis* sellers, rather than under-pricing of seller's shares by an inefficient capital market. The basis for this inference is the observed behaviour of abnormal equity returns during the *post*-divestiture period. Positive abnormal returns are maintained after successful divestitures, whereas Hite, Owers and Rogers (1987, pp. 241-245) show that divestitures which do not proceed are characterised by a reversal of the abnormal returns, unless subsequent follow-up offers are received. However, none of these studies attempted to distinguish the

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[19] Hereafter, cumulative abnormal returns are often referred to more briefly as abnormal returns for a given announcement window.

source of efficiency gains between (a) removal of negative synergies of sellers, and (b) more efficient use in combination with buyers' assets. Evidence that divested units have poorer than average performance and often operating losses suggests (a), but reveals nothing of (b)[20]. Since manager entrenchment (if only to a minor degree) should be pervasive, and given that financial distress is not uncommon even for "healthy" firms in a "bad" year, the reasonably consistent evidence of positive abnormal returns around divestiture announcements suggests these problems are not severe enough to reverse the sign of shareholders' gains. Until LPS, none of the event studies discriminated sellers paying out sale proceeds from those that did not. However, some studies have included the likelihood of financial distress of the seller as an explanatory variable, and one study has examined the wealth effects of divestitures of underperforming assets, both of which suggest a higher likelihood of payout if prospects are poor. A review of the theory and evidence on these perspectives is deferred until the next Chapter.

2.5   CONTRARY EVIDENCE

Evidence contrary to wealth gains on divestiture announcements is sparse. This evidence has appeared in two forms. The first comprises statistically insignificant or significantly negative net-of-market returns accruing to sellers for event windows

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[20] See Duhaime and Grant (1984). The distinction was often recognised, but not tested: see, for instance, Rosenfeld (1984) and Hite, Owers and Rogers (1987).

entirely *preceding* the announcement date by some days: for instance, the event

window [-10, -3] specified by Jain (1985). Negative net-of-market returns prior to

positive returns associated with "regular" sell-off announcements are predicted by

Boot's (1992) signalling model[21], in which managers avoid disclosing bad news

prior to announcing a successful disposal. More generally, the prevalence of

negative returns for *pre*-divestiture windows suggests inefficiency (possibly

stemming from agency problems) causing a deteriorating financial condition[22], with

the result that accessing capital markets may be more costly than raising finance

through asset sales. The second class of conflicting evidence comprises statistically

insignificant abnormal returns over event windows including the divestiture

announcement date. Alexander, Benson and Kampmeyer's (1984) result is robust to

alternative estimational procedures[23], but no lower size bound was applied to the 53

divestitures sampled, so it is possible that immaterial transactions denied them

significance. Denning and Shastri (1990) use a sample of 50 single, isolated

divestments to reduce the likelihood of confounding, simultaneous events, and also

exclude asset sales coinciding with earnings and like announcements. Alexander,

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21 This model is explicated later in the present Chapter.

22 In this thesis, inefficiency has a broader meaning than operating inefficiency. Inefficiency encompasses the costs of agency problems borne by shareholders of an otherwise operationally efficient firm. Hence, the notions of managerial or firm inefficiency cover both sources of inefficiency. The preferred nomenclature is that of firms with agency problems, but since these problems can rarely be observed other than in a context of operating results the preferred approach is to internalise both potential sources of inefficiency in the one notion. Strictly, in competitive equilibria inefficiently-managed firms (for whatever reason) do not exist, but at an empirical level imperfections in output and factor markets mean that operating inefficiencies can survive.

23 These were a mean adjusted returns model and a market-adjusted returns model.

Benson and Kampmeyer (1984) also report insignificance for a sub-sample of 39 single divestitures. Denning and Shastri (1990) define a divestiture as single when only one large[24] divestiture occurs in any two-year period, while Alexander, Benson and Kampmeyer (1984) use a nine-month reference period, but do not impose a lower size bound. Alexander, Benson and Kampmeyer (1984) do not discuss their result. However, Denning and Shastri (1990, p. 741) interpret the non-significance for single divestitures as evidence that the secondary asset market is "efficient", but "ponder" why managers should divest assets for no return[25]. They attribute the positive abnormal returns reported elsewhere to the likely presence of firms divesting after "poor firm or unit performance" (p. 741), which is consistent with the negative abnormal returns widely observed in pre-divestiture event windows.

There are major difficulties with the conclusions of Denning and Shastri. First, the efficiency hypothesis implies wealth *gains*, so they must mean efficiency in the sense of the "no effects hypothesis" when an idealised equilibrium holds. However, this state is unlikely to obtain if multiple divestitures signal other information because asset markets cannot then be in joint equilibrium. Second, Denning and Shastri (1990, p. 731) recognise that a series (or a programme) of divestitures may reflect restructuring and/or the need for cash, but these may variously be good or bad news

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[24] Large is defined as a sell-off in excess of $10m.

[25] Denning and Shastri (1990) also test for constancy in the variance of abnormal equity returns over several windows, but find no evidence of change.

for the seller's shareholders. Positive abnormal returns are attributable to shedding poorly-performing assets only because there is ample evidence of negative abnormal returns pre-divestiture, but Denning and Shastri (1990, p. 737) report insignificantly negative abnormal returns several days prior to divestiture, so perhaps their insignificantly positive return over the divestiture window is due to a smaller reaction to a smaller *quantum* of bad news in the first place. Third, isolated divestitures should be *more* likely to convey good or bad news in their own right precisely because there are no other obvious foreshadowing or concurrent announcements. Since there are no controls for sellers' financial condition and hence imputed motives, good news and bad news divestitures may well have been combined. These conflicts can be largely resolved by sampling smaller as well as larger divestitures to avoid the concurrent signalling problem, testing the financial condition of sellers and divested assets pre-divestiture, and modeling the divestiture decision in a manner similar to LPS to disentangle financing and efficiency arguments.

2.6   FOCUS AND FIT

Corporate finance does not address the question of which activities for a given firm should constitute its core lines of business[26]. This is subsumed in price signals from

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[26] The corporate strategy literature in the area of focus is prescriptive. For example, Porter (1976) and Harrigan (1981) argue that divestitures create more value if they are part of a wider strategy, rather than a reaction to short-run performance.

capital markets as firms seek to remain competitive. Several empirical studies in finance have attempted to extend the notion of efficiency in terms of relatedness arguments; specifically, the degree of relatedness between operating activities and the degree of fit of a new activity with existing activities.[27, 28]

John, Lang and Netter (1992) report that focus increases *via* divestitures of unrelated activities are a common strategy among large firms responding to performance declines, and Kaplan and Weisbach (1992) report that change in corporate focus or strategy is the most commonly disclosed reason for divestitures. The evidence from the industrial economics literature is complementary[29]. Several event studies document increases in focus enhancing market value: see Sicherman and Pettway (1987), Bhagat, Shleifer and Vishny (1990), Comment and Jarrell (1995), Lang and Stulz (1995) and Berger and Ofek (1995).

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[27] A classic example, in which SIC codes are used to establish degrees of relatedness, is Ravenscraft and Scherer (1987).

[28] Clayton and Beranek (1985) partition relatedness by vertical and horizontal integration, as part of their case that divestiture rates of horizontally-integrated (or conglomerate) assets should exceed those of assets essential to the chain of activities leading to the final product market. This idea is not pursued in this dissertation.

[29] Duhaime and Grant (1984) and Ravenscraft and Scherer (1987) report that horizontal and conglomerate disintegrations in the U.S. far exceed vertical disintegrations. While horizontal and vertical expansion both represent related activities, vertically-integrated activities are often suggested as having more synergistic benefits, so are more important for firm survival (see, for example, Clayton and Beranek (1985)).

2.6.1 JOHN AND OFEK (1995)

JO advance a focus rationale as a suggested source of shareholder gains documented on divestiture announcements. Their focus arguments are intended to be compatible with the efficiency explanation of divestitures. Specifically, focus increases are viewed as consistent with the twin efficiency-based motives for divestitures: (a) the removal of negative complementarities experienced by sellers ("poor" focus), and/or (b) positive complementarities expected in the hands of the buyer ("better" fit). Hence, when an asset relatively unrelated to the existing set of activities is divested, an increase in focus is deemed to occur[30]. By implication, buyers are more efficient users because they have a comparative advantage in operating or combining divested assets with their assets in place.

The JO(1995) sample comprises large divestitures (of at least $100 million) reported in the *Mergerstat Review* and announced from 1986 through 1988 in the *Wall Street Journal*, subject to either the buyer or seller being a listed company. Since the *Mergerstat Review* is confined to sales of operating units, disposals of real estate, portfolio investments and liquidations are excluded, as are partial divestitures. The resulting sample size is 321 large divestitures. Large divestitures are chosen because the profitability of remaining assets is tracked post-divestiture. If small asset sales

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[30] The remaining assets are core assets, the implication being that these offer the highest (risk-adjusted) returns, but as explained later in the presence of agency problems this need not follow.

were included, the composition of remaining assets would change more often in comparison with large divestitures that occur less frequently.

Firms divesting assets are found to increase their focus. Three measures of focus are tried, all based on segment membership of the divested business. The first is the number of lines of business reported by the seller. The average number of lines of business is found to decline from 3.5 to 3.3 during the year of the divestiture announcement. The implied increase in focus is statistically significant. The second measure is a sales-based Herfindahl index, H. This index is calculated across n business segments as the sum of squares of each segment i's sales, S_i, as a proportion of total sales:

$$H = \sum_{i=1}^{n} S_i^2 \bigg/ \left(\sum_{i=1}^{n} S_i \right)^2 .$$

H is bounded by 0, 1. As H approaches unity, the firm's sales are concentrated within fewer segments, and hence the more focused its operations. The average value of H increases from .53 before divestiture to .57 at the end of the year of divestiture. The increase, which implies increasing focus, is statistically significant. The third focus measure is based on the relatedness of the divested asset or division to the seller's main operations. A divestiture is classified as increasing focus if the four-digit SIC code of the divested asset (inferred from the host segment) is different from the main four-digit code of the seller. Divestitures are found to increase the seller's focus in 33.8%, 58.7% and 74.6% of cases, respectively, according to the

focus change measure employed. All three focus increases are statistically significant (at the one per cent level).

JO examine the profitability of assets remaining after a divestiture, whether focus-increasing or not (see their Table 3). Profitability is measured in terms of accounting earnings. Three measures are tried, being the ratios of: (1) earnings before interest, tax and depreciation (EBITD) to sales, (2) EBITD to the book value of assets, and (3) EBITD to the market value of equity plus the book value of debt. The year of divestiture is zero. Profitability is tracked for one (0,1), two (0,2) and three (0,3) years cumulatively after divestiture, where 0 is the year of divestiture. To reflect concurrent industry changes, the median change in the same ratio for the same period for all firms with the same four-digit SIC code as the seller is subtracted from the seller's profitability ratio. Thus, a positive excess return suggests the seller is outperforming its industry. Superior industry-relative performance is suggested by the first two profitability measures, particularly for the median (rather than the mean) value, which ranges from .001 to .006. Five of the nine measure type/period intersections are statistically significant at the one per cent level. Of interest, sellers' median profitability was significantly negative in year 0 (the year of divestiture) for two of the three profitability measures, which is consistent with the poor operating performance predicted by Boot (1992) and noted by LPS in formulating their financing hypothesis. JO interpret the relatively poor performance of sellers in the year of divestiture and their subsequent recovery as support part (a) of the focus

hypothesis. The gains are attributed to elimination of negative synergies and improvement of the efficiency of sellers' remaining assets.

The authors do not formally test hypotheses because their object is to describe empirical regularities, but for consistency the main empirical regularities observed are presented as hypotheses because some of these regularities suggest hypotheses which are tested in the present study. JO test whether the profitability of sellers increasing focus following a divestiture is higher than that of sellers not increasing focus. Seller profitability is tracked for the cumulative years 0 to 1, 0 to 2, and 0 to 3. The results are reported in their Table 4. The difference in profitability between the increased focus and no-increased focus groups are significant (and in the hypothesised direction) only when the first profitability measure is used, and also for an industry-unadjusted version of the same measure. This result receives further support from regressions of measure (1) of post-divestiture profitability on alternative measures of focus change. Significance (at the five per cent level) is obtained on the Herfindahl index measure and the focus dummy when used in separate regressions (refer to their Table 5).

JO also observe abnormal returns for buyers and sellers around divestiture announcements (refer to their Table 6). For sellers, abnormal returns over [-2,0] for sellers average 1.5%, with a median of 0.8%, both of which are highly significant. The ratio of the increase in seller's equity value to the value of the divestment averaged 9.9%, with a median of 3.7%, which were also significantly different from zero. These results are closely similar to the abnormal returns reported for [-2,0] by

Klein (1986) and Hite, Owers and Rogers (1987) for [-1,0], but higher than the

0.5% reported by Jain (1985) for [-1,0]. The excess return to buyers, on the other

hand, is insignificantly different from zero, even for a larger event window. This

finding is consistent with the takeovers literature.[31, 32]

In an efficient capital market, the expected increase in future cash flows as a result of

a divestiture is captured in the firm's stock returns when the announcement is made.

Hence, the abnormal return on announcement should be positively related to

increases in cash flow in years immediately following a focus-increasing divestiture.

JO regress sellers abnormal returns on industry-relative market-based ROAs in years

1, 2 and 3, separately (the detailed results are not reported). Intervening variables

are included. These are a base-year value of adjusted EBITD/market value of equity

plus book value of debt, and a firm size variable, measured by log of seller equity

value. The latter variable is included in the event of the size effect. As expected,

sellers' abnormal returns at announcement are found to be significantly positively

related to performance over all three periods. The result is robust irrespective of

whether adjustments are made for industry relativity or the relative size of the

divestiture.

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[31] JO (p.118) suggest several explanations for this finding, ranging from uniqueness of divested assets to seller-specific gains, including reduction in financial distress costs, and overpayment.

[32] This is summarised by Jensen and Ruback (1983).

A further implication of the focus hypothesis is that there should be a positive relation between the abnormal return to the seller on announcement and the degree of increase in focus achieved by the divestiture. Sellers' abnormal returns were regressed against all three measures of change in focus, with the third focus measure obtaining the highest significance (at the one per cent level) (see their Table 7). Abnormal returns were 2.4% higher for firms selling unrelated assets than for firms selling related assets.

Sellers' abnormal returns may be also contingent on whether the divestiture forms part of an ongoing programme to improve focus. In an efficient market, value gains from the increase in focus will be incorporated mainly in the announcement of the first divestiture because managers are signalling a commitment to increased focus. Hence, subsequent divestitures' abnormal returns are lower because only the immediate gains from the divestiture are reflected in the stock price response. To test this proposition, JO employ separate dummy variables to represent (i) the first divestitures in a series, and (ii) focus increasing divestitures. Both are found to be positive and highly significant. However, this specification fails to identify divestitures which are both focus-increasing and the first of a series. Dummies were therefore substituted for (i) increase in focus and first divestiture, and (ii) no focus-increase and first divestiture, or focus-increase and not first divestiture. Again, both dummies were significantly positive. In this specification, the constant term has a unique interpretation, being the abnormal returns accruing to divestitures that neither increase focus nor are first. The constant was insignificantly different from zero.

The highest seller return (3.3%) was obtained for the sub-group of divestitures that were both focus-increasing and first announced.

JO also test the general proposition that gains from divestitures result in part from the better fit provided by buyers of the divested assets. A better fit reflects more efficient operation of the divested asset in the hands of the buyer, *vis à vis* the seller. Some implications of the fit hypothesis are that wealth gains from divestitures are higher when (a) the buyer has a superior organisational form, (b) the buyer has comparative advantage in operating the asset, or (c) when the asset was poorly managed by the seller. Gains from these sources may be passed on to the seller *via* a premium included in the sale price. JO identify variables representing each of the three sources of gain.

Combining the fit and focus hypotheses suggests that seller abnormal returns are (i) highest for divestitures unrelated to sellers but related to buyers (relatedness-increasing), and (ii) lowest for divestitures related to sellers but unrelated to buyers (relatedness-decreasing). In their Table 8, JO report an average seller abnormal return of 2.7% for (i) and -2.2% for (ii). The difference of 4.9% is significant at the five per cent level. They also tested whether the buyer's abnormal return was higher when the divestiture and the buyer were related, but found no supporting evidence. This result is consistent with the empirical evidence on buyer returns.

The fit hypothesis also suggests that gains can be made by buyers acquiring assets from less efficient sellers, such that the *post*-divestiture performance of the divested asset is higher in the hands of the buyer compared with the pre-divestiture operating performance of the seller. In the absence of U.S. data on the operating performance of divested assets, JO match the divested asset with the most closely-related industry segment of the seller in the year before the divestiture (resulting in a sample size of 173). Segment profitability is therefore assumed the same as the profitability of the divested asset. Substantial measurement error is recognised because segments rarely correspond to the divested asset. The ratio EBITD/sales is compared with the industry median in the year prior to divestiture, but no significant difference is obtained, so detailed results are not reported[33]. Although post-divestiture performance of an asset directly measures superior fit with the buyer's existing assets, this approach is precluded by lack of data in the U.S. Instead, JO track the buyer's overall performance for the first three post-divestiture years, but the results are inconclusive. This outcome is attributed in part to the noisy nature of the performance proxy for the acquired asset.

In summary, JO extend our knowledge of the sources of efficiency gains engendered by divestitures. In about three-quarters of all cases, there is a significant increase in focus of the seller's operations. Further, significant improvement in the operating performance of the seller's remaining assets over the three years following

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[33] The result is consistent with Kaplan and Weisbach (1992), who find that neither book gains nor losses are predominant in relation to divestitures.

divestiture is documented, but only for firms that increase focus. Sellers' abnormal returns for [-2, 0] on announcement are positively and significantly related to both (a) the increase in focus, and (b) the subsequent cash flow changes for the seller's remaining assets. The latter result suggests the stock market efficiently anticipates the future benefits of increased focus. Moreover, the seller's abnormal returns are significantly higher when the divested asset is unrelated to the seller and related to the buyer, than when the divested asset is related to the seller's activities but unrelated to the buyer's activities. JO (p. 125) conclude that "increasing focus seems to dominate other explanations for divestitures, such as finding a superior fit for the divested asset or using the proceeds to repay debt".

2.6.2 PORTFOLIO ARGUMENTS

Focus arguments may be paraphrased in terms of option pricing theory. Sarig (1985) presents option pricing arguments that divesting unrelated activities should increase both the value of divested and remaining assets when unrelated activities are sold off. The former result is applicable to spin-offs where the existing shareholders retain some ownership interest, but the second argument suggests a further reason for market gains to sellers of unrelated activities. The proposition relies on the theorem that the value of a portfolio of two options dominates the value of one option[34]. Equity is viewed as a call option on the firm's (risky) assets. If a

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[34] See, for example, Figlewski, Silber and Subrahmanyam (1990, pp. 37-40).

subsidiary company is incorporated to own each asset, and if that asset incurs losses, shareholders can invoke their limited liability by allowing their call option on that asset to lapse, that is, the company owning the asset is liquidated. But when all assets are owned by a single company, the ownership option is not allowed to lapse as long as the other assets render the option valuable. In other words, shareholders subsidise the losses from other assets' profits. In a two-asset world, divestiture effectively grants a double option on the underlying assets, which is more valuable than single option protection.

Since limited liability protection is an option, its value increases as the riskiness of the firm's assets increases. However, as the covariances of returns between assets become less positive, the value of the single call option falls. Unrelated activities (or lines of business) are implicitly assumed to have zero covariances, so when unrelated assets are divested the call on the undivested assets becomes more valuable than when these assets are held in combination with the divested assets.

2.7   CHAPTER SUMMARY

This Chapter has established that the process of divestiture has no implications for development of the efficiency and financing rationales for divestitures. The efficiency argument has been explicated and expectations corresponding to this argument formed. Financially-distressed sellers are presented as a special case of

efficient redeployment, with opposite wealth effects for shareholders compared with standard efficient redeployment. A review of the evidence for and against the efficiency rationale for asset sales is concluded to be supportive, but only superficially so because competing hypotheses have not been formally tested. After linking focus and fit arguments to the efficiency rationale, the corresponding evidence within a finance paradigm, principally that reported by JO, was carefully examined. An alternative rationale from portfolio theory was briefly considered.

CHAPTER THREE

AGENCY PROBLEMS IN A DIVESTITURES CONTEXT

3.1 INTRODUCTION

This Chapter has two aims. The first is to articulate the linkages between agency problems, debt and divestitures. This is necessary because it is possible that agency problems are exacerbated by a contemporaneous change in the selling firm's capital structure resulting from a payout exclusively to one group of claimants. In other words, a capital structure argument may incorrectly be represented as an agency problem.

The second aim of this Chapter is to consider the mechanism by which agency problems influence the divestiture decision. Two analytical models relevant to this purpose models have been developed, and are reviewed here. The first model is that of Boot (1992), who argues that self-interested managers have an incentive to delay selling assets, even when they are poorly performing[1]. Second, Shleifer and Vishny (1989) propose a model in which entrenched managers overinvest in entrenching assets, and underinvest in non-entrenching assets.

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[1] This argument in turn implies that managers have a similar incentive to reduce disclosures of private information with respect to the same assets.

3.2 DIVESTITURES, DEBT AND AGENCY PROBLEMS

3.2.1 THE ISSUE

Datta and Iskandar-Datta (1996, p. 42) assert that leverage changes induced by a payout of sale proceeds can generate predictions similar to the agency arguments of LPS. It is not clear whether their claim, which is unsubstantiated by *a priori* reasoning, is meant to be considered in a scenario with or without agency problems. However, to resolve the point, both scenarios are examined. The main purpose of this section, then, is to show that the LPS position is not altered when leverage effects are taken into account, irrespective of whether sale proceeds are paid to shareholders or debtholders. This is done by showing that agency arguments subsume the effects of any leverage changes induced by payout. To demonstrate this it is necessary to articulate expected relations between divestitures, agency costs and the payout choice in terms of their impact on the relative values of debt and equity claims. Since asset sales may be made for the purpose of raising finance when access to capital markets is expensive, the impact of financial distress needs to be examined also.

3.2.2 EXPECTED WEALTH EFFECTS OF ASSET SALES IRRESPECTIVE OF THE REINVESTMENT DECISION

When agency problems and financial distress are absent, all asset sales are driven by the relative inefficiency of the seller relative to the buyer, who bids a price in

excess of the present value of the asset to the seller. The wealth gain to the selling firm is distributed across the claims of both shareholders and debtholders. When sale proceeds are profitably reinvested, the value of outstanding debt is increased because debtholders have recourse against an increase asset base, while the value of equity increases as long as the equity has value as an option. The latter state occurs when shareholders are prepared to pay interest (the exercise price) to maintain their residual claim on the firm's assets[2].

In the event that no positive NPV projects are available, sale proceeds are paid out to shareholders. Debtholders also gain because reinvestment of the sale proceeds in negative NPV projects would reduce the value of collateralised assets. Hence, in the absence of agency problems and distress, shareholders and debtholders gain when divestitures are made, irrespective of whether the sale proceeds are paid out or not. The preceding expectations should hold even when a divested asset is collateral for existing debt, because debtholders will not consent to its sale unless either (a) they are paid out from the sale proceeds, or (b) their claim against the new asset or other assets is worth at least as much as their former claim. Profitable divestitures made under conditions of no agency problems and no distress are characterised as the standard case (case #1) in Table 3.1.

When agency problems are introduced, managers act in their own self-interest.

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[2] Consistent with Modigliani and Miller's (1958) proposition #1, the value of debt and equity claims together increases by exactly the amount of the gain in firm value consequent upon the disposal. Variations in the debt/equity mix therefore do not influence the gain in firm value.

Table 3.1. Expected wealth effects of divestiture gains or losses, irrespective of disposition of sale proceeds.

Case #	Effect of divestiture on shareholder wealth	Effect of divestiture on debtholder wealth	Effect of divestiture on manager wealth
1. Standard case: no agency problems, and no distress sales	positive	positive	n.a.
2. Asset sales by firms with agency problems, but not in financial distress	negative	negative	positive
3. Distress sales	negative	positive	n.a.
4. Asset sales forced by regulatory authorities	negative	negative	negative

The agency cost of managerial discretion is the decline in shareholder wealth resulting from managers not acting on their shareholders' behalf. Hence, managers can potentially expropriate the wealth of shareholders and debtholders whenever either group fails fully to anticipate managers' incentive to do so, or is unable to effect an efficient contracting solution to the problem. When managers act out of self-interest, asset sales may take place for reasons other than efficient redeployment.

The direction of impact on shareholder and debtholder wealth depends on the extent of the agency costs. It is possible to identify two classes of agency-influenced asset sales, according to whether or not specific reinvestment of the

sale proceeds is intended. For the present purpose, analysis is confined to cases of agency-influenced asset sales not requiring a reinvestment assumption. Examples are where (a) the sale should optimally have been made earlier (Boot (1992)), and (b) an asset sale signals financial difficulties and hence raises the problem of adverse selection for sellers not in distress (Myers and Majluf (1984)).

In case(a), characterised by Boot (1992, title) as "hanging on to losers", managers gain when an asset sale is deferred past the time when a sale is optimal for shareholders because a sale signals a past mistake. The cost of delaying the sale is the fall in resale value while the asset is retained, which reflects the firm's comparative inefficiency. By implication, debtholders also lose because a delayed sale transfers wealth from debtholders to managers. Case (b) is related to case (a). Asset sales by healthy firms may incur a penalty if the disposal falsely signals financial distress. This is possible when a significant fraction of industry asset sales are in fact made for financing reasons. Knowing the parlous condition of the sellers, buyers are able to enforce a discount to the regular market price. Healthy firms selling assets at the same time therefore run the risk of accepting a lower sale price unless they can successfully signal their stronger negotiating position. In the event they cannot efficiently convey information of their superior condition[3], healthy firms may therefore defer their sell-offs, producing the same wealth effects as case (a), which are described by case #2 in Table 3.1.

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[3] For instance, revealing the motive for a disposal may also reveal proprietary information valuable to competitors.

The assumption of no financial distress is now relaxed. Financial distress occurs when a firm has difficulty raising cash to meet creditors' obligations. When debtholders are unwilling to roll-over their claims or negotiate new lines of credit and equity can only be sold at a substantial discount to market, asset sales may be the least costly means of raising finance, but nonetheless have the potential for transferring wealth from shareholders to debtholders. In the absence of agency problems it is neither in shareholders' nor debtholders' interest to sell assets below NPV for financing purposes, but any efficient down-sizing reduces the option value of equity in that fewer assets are available with attached growth options. In the presence of agency problems, creditors may well force the sale of assets below NPV because managers are expropriating a portion of any value added from continued operations. Evidence of significant wealth transfers from shareholders to debtholders is reported by Brown, James and Mooradian (1994). The wealth effects of distress sales are described by case #3 in Table 3.1.

Also shown in Table 3.1, for completeness, is case #4 representing divestitures imposed by regulatory authorities, typically in Australia in the media and banking industries. Forced divestitures transfer wealth from all three claimants to competitors in the product market[4].

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[4] For evidence on this point see, for example, Eckbo (1983), Stillman (1983) and Weir (1983).

3.2.3 DISPOSITION OF SALE PROCEEDS WHEN THERE ARE AGENCY PROBLEMS

3.2.3.1 REINVESTMENT

A potential for wealth transfers between financial claimants exists whenever managers have discretion over the use of the sale proceeds, that is, for reinvestment or disbursement. Both can influence the relative values of wealth claims. Reinvestment in assets of the same risk class to that of the divested asset should not generate wealth transfers between claimants[5], but reinvestment in assets which are riskier or less risky (in terms of variance of returns) is likely to. A clear example of the former is asset substitution (Jensen and Meckling (1976)). Since equity has option value, shareholders gain as riskier assets are substituted, which effectively transfers wealth from debtholders to shareholders. Managers are wealth-neutral if they are acting wholly as agents. Otherwise, managers would gain from substituting riskier assets only if their compensation were designed to promote this preference. Debtholders can reduce this agency cost of debt by price-protection or imposing loan conditions, but this also reduces managers' investment opportunities. Thus, some degree of asset substitution is tolerated.

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[5] Asset sales to avert a takeover (sales of "crown-jewels") result in the threatened firm substituting cash or liquid assets, which are less risky than the divested asset. However, the proceeds are either paid out as a dividend to shareholders, or reinvested in (presumably) existing lines of business once the threat has passed. The former outcome is less likely to the extent that managers value size and control.

Long-term unsecured lenders, or lenders with floating charges as security, would seem to be at the greatest risk.

However, selling assets to effect an asset substitution should not be commonplace. An asset sale suggests the substitution cannot be financed out of debt or equity raisings, which capital should be a signal to existing debtholders that they are about to be expropriated if the investment goes ahead. These debtholders would therefore attempt to renegotiate their debt, or not roll their debt over. Vetsuypens (1985) examined bondholder returns around divestiture announcements where the potential for asset substitution was greatest, but found evidence of wealth *increases*, so concluded that asset substitution was not economically significant.

Sell-offs in order to substitute assets preferred by managers should be more common to the extent they directly reflect the degree of managerial discretion. Shleifer and Vishny (1989) conjecture that self-interested managers value assets that are entrenching, that is, lower the probability of their removal. Assets that become less effective as entrenching vehicles are replaced by assets which are valued more by managers than shareholders. Recall that entrenched managers are not operationally inefficient, for their entrenchment springs from a higher cost of replacing the incumbent managers. Entrenched managers invest in a narrower domain of investments (and hence risks) than their shareholders would prefer, for which the variance of returns is lower than it would be in the hands of alternative managers. Since entrenching assets are relatively less risky, reinvestment in

entrenching assets transfers some wealth from shareholders to managers. When the NPV of such reinvestment is positive, the gain on reinvestment is therefore shared between managers and shareholders. However, when managerial discretion is large, acquired assets may even have a negative NPV (where managers pay more for the acquired asset than shareholders would have), in which case shareholder wealth actually declines. Assuming entrenching assets are no riskier than the divested asset, debtholders therefore also gain when NPV > 0. They *may* lose if managers overpay (NPV < 0), but could possibly gain if the entrenching asset is sufficiently less risky, so no prediction is entered for debtholders with overpayment.

Given that entrenching behaviour is more likely than asset substitution, the expectations on reinvestment should align with those for entrenchment. These are shown as case #2A in Table 3.2.

3.2.3.2 PAYOUT

Before analysing the wealth effects of a payout in the presence of agency problems, the corresponding effects of payouts by efficient firms without agency problems are first reviewed for benchmarking purposes. Payouts to shareholders by efficient firms without agency problems should have no impact on shareholder returns given public knowledge of poor investment opportunities, but should have

a negative impact where a payout necessarily signals (from managers' private information) a lack of investment opportunities. Since this is compatible with the efficient redeployment hypothesis, this argument implies shareholder wealth effects opposite to those predicted by LPS. Payouts to debtholders would be interpreted in the same way.

Table 3.2. Expected wealth effects of dispositions of sale proceeds, given agency costs of managerial discretion.

Case #	Effect of reinvestment or payout on shareholder wealth	Effect of reinvestment or payout on debtholder wealth	Effect of reinvestment or payout on manager wealth
2A. Reinvestment in entrenching assets	NPV>0: positive NPV<0: negative	NPV>0: positive NPV<0: no prediction	positive
2B. LPS position:			
i. payout	positive	no prediction	negative
ii. reinvestment	negative	no prediction	positive
2C. 2Bi extended:			
i. payout to debtholders	positive	non-negative	negative
ii. payout to shareholders	positive	negative	negative

Now consider payout in the context of agency problems. Unlike the preceding scenarios, the payout choice merely has distributional consequences because expectations are not further revised. The wealth transfers between the three claimants are therefore subject to the overall constraint of a zero-sum game; that

is, the sum of the wealth effects is zero. Datta and Iskandar-Datta (1996) argue that the distinction between payouts to debtholders *versus* shareholders may be important. Payouts to shareholders typically take the form of dividend payments, share repurchases or capital reduction. The value of outstanding debt is diminished by any of these because debtholders have recourse against a smaller asset base. Shareholder and debtholder wealth effects are therefore examined for both payout and reinvestment, with a view to demonstrating that the distinction is not important in interpreting the results of a test of the financing hypothesis proposed by LPS.

Before proceeding, recall the LPS argument. They argue that sale proceeds, when retained within the firm by self-interested managers (that is, firms with agency problems), reduce shareholder wealth because managers will not use the proceeds in the way preferred by shareholders. Hence, in this scenario, payouts increase shareholder wealth because managers have control over fewer assets through which to expropriate shareholders. The LPS position does not distinguish payouts to shareholders from debtholders because both reduce the value of assets subject to managerial control. LPS expect payouts to debtholders to predominate because asset sales for financing purposes are likely made by firms with high leverage and/or poor operating performance: that is, to reduce the probability of financial distress. It is important to recall that LPS ascribe payouts to debtholders

to the financing motive and not to financial distress, for in this case the predicted

wealth effects would be different (refer case #3 in Table 3.1)[6].

Since the LPS position assumes agency problems and no distress, it is classified as

case #2B in Table 3.2. LPS predict only the equity and managerial wealth effects

for payout (case #2Bi) and reinvestment (case #2Bii). Since managers exercise

their discretion at shareholders' expense, the impact of a payout choice on their

wealth is opposite to that of shareholders. In the payout case, managers lose

because they have fewer assets subject to their control(not the least of which is the

probability of losing their jobs, and hence their rents)[7]. It is important to realise a

point not made by LPS: that shareholders gain irrespective of whether the payout

is to themselves, *or to debtholders*. Given agency problems, a debt payout

effectively conserves the sale proceeds, because reinvestment by self-interested

managers would ultimately result in less funds being available to pay down debt

than at present. Conversely, for reinvestment (case #2Bii), managers gain and

shareholders lose to the extent of the agency costs of managerial discretion.

The LPS reinvestment position (case #2Bii) corresponds closely to the general

agency problem case #2 in Table3.1, and is compatible with case #2A in Table 3.2

(reinvestment in entrenching assets). As expected, the LPS payout position (case

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[6] LPS (p. 8) themselves note in passing that only five of their 40 payout observations included *some* payments to shareholders; none was solely to shareholders.

[7] This possibility is recognised by LPS (p.5).

#2Bi) is not, and differs from an efficient payout (case #1 in Table 3.1) with respect to the management wealth effect (that is, negative *versus* no effect). Case #2Bi is now extended to show the wealth effects of payouts to debtholders *versus* shareholders, and is shown as case #2C in Table 3.2. As noted above, shareholders gain whenever there is any payout and by corollary managers lose, so the only remaining question concerns the impact on debtholder wealth.

Consider case #2Ci. Payouts to debtholders may be undertaken by self-interested managers in order to reduce financial distress costs. Such payouts can never reduce the value of all debtholders' claims, that is, the wealth of exiting and continuing debtholders combined. To see how debtholders cannot lose, consider the general case of risky corporate debt, and assume no changes in interest rates since the debt was issued. The value of any debt claim prior to settlement at maturity is therefore always less than the contracted amount because default risk is never eliminated until repayment takes place. Assume two debt tranches are outstanding. If one tranche is paid out, these debtholders enjoy a wealth transfer from the other debtholders whose claims are still outstanding[8]. In non-distress circumstances, the remaining debtholders also gain because there are proportionately more assets available to satisfy their claim. Thus, debtholders as a single group gain because both exiting and continuing debtholders gain. The cost of the wealth transfer to debtholders is borne by shareholders and managers.

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[8] The distinction between generations of debtholders is important in establishing incentives of managers to accept growth opportunities; see Myers (1977).

To illustrate, consider a firm with total assets worth $100 and two debt tranches with a market value of $25 each, leaving $50 worth of equity. These values are already lower by the incidence of any agency costs. Assume that interest rates do not change. The face value of each debt tranche is $28, so the $3 difference represents the impact of default risk. Now assume that one of the debt claims is paid out. This leaves $72 of assets to satisfy $28 of continuing debt, the value of which increases marginally from $25 to (say) $27, because the debt/assets ratio of the firm has improved from 56/100 to 28/72, using the contracted amounts. The value of the two debt claims has increased: paid out debtholders have gained $3, while the value of continuing debtholders' claim has risen by $2. This is matched by a $5 loss borne by shareholders, the value of whose claim has fallen from $50 to $45.

There is one special case in which debtholders do not gain. This occurs when the value of shareholders' claims is negative and the firm has no growth opportunities. The firm may still be solvent because the debt overhang may be long term, allowing the firm to meet short-term obligations from its operating cash flow. Nevertheless, leverage should be high: recall that LPS' (1995) sample of divesting firms has high leverage. To see how debtholders' gains may be eliminated or severely reduced, consider a variation on the previous example. Assume for whatever reason (including agency problems) that the value of the firm's assets has eroded, down to $50. These problems were necessarily not anticipated when the debt was issued, for otherwise debtholders would have price-protected when

the terms of the debt issue were negotiated. The debtholders now have claims totalling $56 against assets worth $50. In the absence of growth opportunities, the equity value is zero, so the value of both debt claims combined is fixed. Both debtholders face a zero-sum game. If one debtholder is paid out ahead of another, this triggers a wealth transfer from the continuing creditor to the paid out creditor. However, where growth opportunities exist, then the equity has an option value[9], which raises the value of the claim of the continuing creditor. To summarise, in case #2Ci the value of all debt claims increases as more debt claims are paid out, but at a diminished rate as the firm is closer to bankruptcy, that is, as the equity becomes smaller. When the option value of equity is zero, debtholders gain nothing. Hence, in case #2Ci debtholders do not lose.

In contrast, in case #2Cii debtholders lose when shareholders are paid out. This is obvious enough in a standard capital structure context where debt and equity claims compete for assets of known value, but is does not hold for the same reason when employing agency arguments. When agency problems exist, managers expropriate a portion of the firm's value to enhance their own wealth. If, at the same time, shareholders receive a payout, then debtholders have a proportionately higher exposure than before to agency costs, irrespective of the extent of the agency problem. This particular wealth transfer is in addition to another negative wealth transfer induced by higher default risk, suggested by an

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[9] This is the value of a call option on the assets of the firm (including growth opportunities), where repayment of the debt obligations is the exercise price.

increase in (that is, a deterioration of) the debt/assets ratio. Since the sign of debtholder wealth effects depends on the recipient group, no prediction can therefore be made for debtholder wealth effects in case #2Bi (for payouts in general when agency problems are present).

In summary, the LPS expectation of an equity gain on payout in the presence of agency problems is invariant with respect to the recipient of the payout, whereas the value of all debt claims may either rise or fall. Since only shareholder wealth effects are the subject of analysis, the criticism of Datta and Iskandar-Datta (1996) is avoided.

3.3   THE COMPATIBILITY ARGUMENTS OF BOOT (1992)

Boot (1992, p. 1407) models equilibrium conditions in which a divestiture is not always made immediately an asset's return becomes insufficient (that is, the asset is "incompatible"). "Good" managers, who are efficient managers (and implying an absence of agency problems), divest assets to more efficient users as soon as they become "incompatible" (that is, unprofitable) in combination with the firm's existing assets. Compatible assets are not divested. In contrast, "bad" managers who are either inefficient or self-interested, bear a reputational cost when an asset sale is announced. Assuming divestitures are fully revealing with respect to the divested

asset[10], past mistakes (for instance, a profligate acquisition) are signalled when the intention to sell becomes known. Since the gain on disposal is lower for inefficient firms (or, more accurately, firms with agency problems), marginal divestment decisions may therefore be deferred until that time when disposal is more strongly predicated (that is, after the present value of continued use has fallen further relative to the sale price). *Cet. par.*, the result is that inefficient managers sell "losers" later than efficient managers[11]. Note that any bad news (signalling a past mistake) is independent of the probability of finding a compatible buyer, as reflected in the level of discount required to complete a sale. In an efficient capital market, the bad news will precede the good news of an agreement to sell, if only by a few days.

Boot's model is consistent with efficient redeployment. In general, more divestitures of incompatible than compatible investments are expected because the former have not been deployed in their highest-valued use: even efficient managers need to divest assets that have (unexpectedly) become incompatible in their existing uses. Since the disclosure cost borne by inefficient managers is asset- and not firm-specific, the financial condition of the seller (including the need for cash) is not signalled. There is no information in the use of the sale proceeds because the divestiture itself is fully revealing.

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[10] A disposal value removes all uncertainty about factors affecting the value of an asset to the seller.

[11] Note that rationality in the sense of selling only at a price above present value is still assumed.

Boot also generates other hypotheses. Chief among these is that hostile takeover bids are most likely when assets of moderate specificity are inefficiently-managed. Specificity is roughly parallel to liquidity or ease of re-sale, which in turn is positively related to profit potential. Highly specific assets are difficult for raiders to on-sell, while assets of low specificity offer little prospect of capital gain because a liquid asset market guarantees that these are already operated efficiently. In Boot's model, inefficient managers can survive through entrenchment by virtue of high asset specificity[12]. Hence, inefficient managers face the highest threat from the market for corporate control with respect to assets of moderate specificity. To reduce this threat, such managers are therefore expected to divest moderately specific assets more often than those of high or low specificity. The argument can be paraphrased in terms of liquidity without much loss of generality. However, Boot's model does not readily extend to embrace the notion of relatedness between activities as, for instance, employed by JO. The notion of incompatibility suggests the divestiture of activities or operations that have become unrelated to core activities, whereas assets of moderate specificity may well comprise related activities.

3.4   MANAGER ENTRENCHMENT

Shleifer and Vishny (1989) propose an analytical model in which both acquisitions and divestitures are made by managers primarily for the purpose of entrenchment,

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[12] This notion of entrenchment must be distinguished from that of Shleifer and Vishny (1989), where entrenched managers are efficient operators.

which is an agency cost of equity. This is possible when control mechanisms such as the board of directors, the managerial labour market, and the threat of hostile takeover are partly ineffective, largely as a result of managers' own actions. Given the impairment of control systems, it is not necessary for entrenched managers to own a significant portion of the firm's equity, although this may turn out on occasion to be the most effective way of controlling the firm. By implication, the value of the firm is not maximised, but entrenching assets have higher value under incumbent managers than under other managers not possessing the same set of skills or experience[13]. The latter condition suggests past investment decisions are irreversible, which occurs when a fraction of the investment outlay of entrenching assets cannot be recovered by resale. Given partially effective monitoring, it is even possible for entrenching assets with *negative* net present values (NPVs) to be acquired. The main costs borne by shareholders are twofold. First, firm value is not maximised. Second, and even apart from the first cost, entrenched managers are able to capture higher quasi-rents from shareholders because control mechanisms are partially crippled. Their benchmark performance is not a market-determined risk-adjusted required return, but a lower return implicit in the (low) likelihood of a higher-than-present value bid, either for the asset or the entire firm.

Growth in the firm's assets may either be localised, that is, in the firm's existing activities, or diverse. Non-diversification is expected when the returns on existing

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[13] Using Boot's (1992) terminology, entrenched managers' inputs increase the specificity of the firm's assets.

activities are adequate. However, persistent poor returns should induce managers to diversify into new activities that reinforce continuation of entrenchment. Once entrenching assets can be operated more profitably by alternative managers, the entrenching advantage is lost and the assets should be divested.

Shleifer and Vishny (1989, pp. 134-135) give the example of marketing-trained executives who diversify into new brand names once the existing operations have become unprofitable due to lack of cost-cutting skills. By diversifying into a new business, the executives decrease their vulnerability to replacement because their performance in managing the existing business would have been worse. By corollary, entrenched managers are more likely than non-entrenched managers to overpay for acquisitions of entrenching assets. The likelihood of overpayment is higher when the firm is already under-performing its industry peers or lacks growth opportunities in it existing activities. In summary, entrenched managers invest in a constrained set of investments that is sub-optimal from shareholders' perspective. Entrenched managers have little incentive to be efficient in their operating performance, save that they must be more efficient than the next best alternative management team[14]. Assets are divested only when another manager can operate them more efficiently (in which case entrenchment benefits are no longer produced)

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[14] Entrenched managers are difficult to identify using debt arguments. Given their below-par performance, incumbent managers cannot afford to service high debt levels. Moreover, the interest payment obligations of high leverage in its own right would pressure managers to become more efficient (Jensen (1986)). On the other hand, entrenched managers can afford to service moderate debt levels.

or when the acquirer is overpaying to acquire assets that are valuable for entrenching the acquirer's management.

Even entrenched managers sell assets only when the acquirer can bid more than an asset is worth in its current use, so divestitures of non-entrenching assets should always increase the price of the divesting firm's shares. Since the efficient deployment hypothesis also predicts positive abnormal equity returns for sellers, sales of non-entrenching assets are difficult to distinguish from divestitures for efficiency reasons. Attempts to diversify out of declining industries are consistent with both efficiency and entrenching arguments. Entrenched managers therefore should rarely have to accept a lower sale price[15] to rid themselves of assets that no longer effectively entrench because the very lack of entrenchment potential suggests a likelihood of profitable disposal.

In short, Shleifer and Vishny's (1989) entrenchment arguments do not cut across the efficiency hypothesis. What they demonstrate is the possibility that non wealth-maximising managers can survive even when capital markets are competitive and informed, as long as they are the most efficient operators of the firm's assets in place. Neither debt nor managerial ownership of equity arguments need be invoked to explain or support this behaviour. Firms characterised by entrenchment are likely to have significant asset sales volume only when shifting preferred industries, but this can happen on straight efficiency grounds as well. However, the proceeds of any

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[15] This point is recognised by Shleifer and Vishny (1989, p.135).

asset sales are reinvested in order to reinforce managers' entrenchment, and are not paid out to shareholders or used to pay down debt. This prediction differentiates the entrenchment motivation from the efficiency hypothesis. No predictions are made with respect to divestiture rates, or divestment of non-core activities, of entrenched *versus* non-entrenched sellers because divestiture rates on efficiency grounds and those enhancing entrenchment are both exogenously determined by opportunities in the economy.

3.5   CHAPTER SUMMARY

After exhaustive scrutiny of the capital structure consequences of divestitures with reinvestment or payout of the sale proceeds, it has been concluded that the wealth effects of any changes in the debt/equity mix are accommodated within the framework of the financing hypothesis. Specifically, it has been concluded that the LPS expectation of an equity gain on payout in the presence of agency problems is invariant with respect to the recipient of the payout.

This Chapter has also reviewed two analytical models and identified insights relevant to accurate identification of the financing hypothesis, which is developed in the next Chapter. Boot's (1992) analytical model establishes conditions in which "bad" managers intending to divest assets signal bad news of a past mistake, so these managers have an incentive to defer disposals. "Bad" managers include self-

interested as well as inefficient managers. Divestitures by "good" and "bad"

managers alike are consistent with efficient redeployment. The contribution of

Shleifer and Vishny's (1989) analytical model to hypothesis development is more

direct because the consequences of manager entrenchment are analogous to agency

problems in general. Importantly, entrenching behaviour does not rule out efficient

redeployment of assets: entrenched managers merely invest in a smaller set of assets

than their shareholders would prefer.

CHAPTER FOUR

DISTINGUISHING THE FINANCING HYPOTHESIS FROM RELATED EXPLANATIONS

4.1   INTRODUCTION

The financing hypothesis suggests that asset sales for financing purposes may be optimal when obtaining funds from capital markets is relatively more expensive, due to agency problems. A need for cash suggests poor *pre*-divestiture performance either of the divested asset or the firm itself. Given this rather obvious inference, it surprising that only a few studies have included variables to represent these factors. This evidence is now reviewed, only to be found inadequate for distinguishing the efficiency and financing explanations. The financing hypothesis is then formally stated and differentiated from related concepts.

4.1.1   FINANCIAL CONDITION OF SELLERS

The impact of the financial standing of the seller on stock price reactions to divestiture announcements has been examined by Hearth and Zaima (1984), Zaima and Hearth (1985), Sicherman and Pettway (1992) and Afshar, Taffler and Sudarsanam (1992). The two latter studies both recognise that asset sales can signal

a worse financial condition than already known by investors, resulting in costs imposed on sellers *via* lower sale prices for divested assets and increased borrowing costs[1]. But where a seller's financial distress is already known, a positive stock price reaction when asset sales are announced is expected because financial slack has increased and the probability of bankruptcy has been reduced[2]. In other words, finding a buyer is good news.

Hearth and Zaima (1984) report more highly positive [-10, 0] abnormal returns for divestitures by sellers with "good" financial status than for sellers having "poor" financial status, but the significance of the abnormal return differences between "good" and "poor" sellers is not reported. Financial status was determined using Standard & Poor ratings (with the cut-off below A-). Their sample of 58 divestitures consisted of both large and small asset sales. However, Zaima and Hearth (1985) were unable to replicate their result on a larger sample (168) with a similar composition, but excluding disposals of less than 50 per cent equity ownership. Sicherman and Pettway (1992) report lower positive [-1, 0] abnormal returns (0.37 per cent) for sellers that were credit-downgraded than for sellers not downgraded (1.13 per cent), but again the significance of the return differences between the two groups was not tested[3]. They also examine the corresponding

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[1] Note that bankruptcy avoidance implies paying down debt with the sale proceeds.

[2] Financial slack enhances the capacity of a borrower to service debt: see Myers and Majluf (1984).

[3] Sicherman and Pettway (1992) additionally report that credit-downgraded sellers not disclosing sale consideration exhibit small, positive abnormal returns not significantly different

abnormal returns of matched buyers, and conjecture that buyers from downgraded

sellers should have more positive abnormal returns than buyers from non-

downgraded sellers, because in the former case buyers are in a stronger negotiating

position. However, the abnormal returns of buyers are found to be significantly

positive, irrespective of whether sellers have been downgraded or not.

Afshar, Taffler and Sudarsanam (1992) regress (mainly positive) announcement day

returns on several variables and obtain significantly negative coefficients on z-scores

in several regressions. This result is interpreted by the authors as suggesting that

distress sales are good news for sellers' shareholders, and is at odds with the

findings of Brown, James and Mooradian (1994), who identified distress from

qualitative disclosures in the financial press. Afshar, Taffler and Sudarsanam's

conclusion does not follow because z-scores do not distinguish divestitures for

financing reasons from those by sellers in financial distress. Z-scores are a

composite measure of several financial ratios, where the value varies inversely with

bankruptcy risk. Hence, asset sales by firms with low z-scores are likely to be for

financing reasons, while distress sales are likely made by sellers with the lowest z-

scores. The inverse relation between abnormal returns and z-scores is in all

likelihood consistent with the LPS position, because firms with low z-scores would

seem to have more cause to pay out their sale proceeds, especially to pay down

debt.

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from the returns accruing to disclosing sellers. Further, the abnormal returns accruing to non-downgraded disclosing sellers are found to be significantly higher than those for (a) downgraded and disclosing sellers, as well as (b) non-downgraded and non-disclosing sellers.

4.1.2   OPERATING PERFORMANCE OF DIVESTED ASSETS

Absent special purpose sales, Boot (1992) posits that asset sales signal a past mistake. This suggests that asset sales on average are likely to be of poorly-performing assets. Shleifer and Vishny (1992) point out that the market for such assets may be illiquid if the most efficient buyers are competitors who are also credit-constrained owing to depressed industry conditions. If so, distressed firms may have to sell these assets at a discount (that is, below present value in the current use) in order to raise cash. Given financial distress, sale proceeds are likely to be paid out to debtholders, even if buyers are relatively more efficient operators.

Given the common assumption that stock price gains on divestiture announcements suggest efficient redeployment, it is somewhat surprising that only one study has included a variable representing the operating performance of the divested asset. Denning (1988) included a variable for loss-making operations in a study of 133 single divestitures by listed U.S. firms between 1970 and 1982; 23 of these divestitures were disposals of loss-making operations, identified from either direct disclosures or inferred from divestitures following "a year or more of quarterly earnings reports which indicated large losses"[4]. No expectation was formed on the net-of-market return on divestiture of loss-making operations. These returns over short windows around the divestiture announcement were small and positive, but

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[4] Denning (1988, p. 35).

insignificantly so. The majority of returns observed for the 23 sales across four event windows were positive, and this result is attributed to efficient redeployment (p. 38). Unfortunately, the mean sample stock price response is not reported, so no comparison is possible. Interpretation of Denning's result is rendered even more difficult because "losing" assets do not imply an inefficiently-managed seller, for efficient firms are more likely to divest assets that have become "losers" (Boot (1992)). Another problem is that Denning did not directly observe the loss-making operations: managers may have disclosed losses only when the sale was consummated, so that bad news was offset by good news. Further, quarterly earnings reports allow attribution of firm-level losses to the divested asset only when the asset sale is very large relative to the size of the seller.

4.2   CONSOLIDATION OF ARGUMENTS OF 4.1.1 AND 4.1.2

Evidence on the joint effect of the financial condition of the seller and the operating performance of the divested asset is reported only by Ravenscraft and Scherer (1987), who analyse the sell-off decision with respect to acquisitions made in the 1960s and divested between 1974 and 1981. The sell-off choice is modelled in a logistic regression (see their chapter 6), where the probability of a sell-off is found to be negatively related to the operating performance of both the firm and the divested asset. However, it is difficult to relate this evidence to the abnormal return evidence because the Ravenscraft

and Scherer (1987) model is probabilistic, and does not include a net-of-market return variable.

To sum up, when reviewing the evidence of Hearth and Zaima (1984), Zaima and Hearth (1985), Sicherman and Pettway (1992), Afshar, Taffler and Sudarsanam (1992), Denning (1988) and Ravenscraft and Scherer (1987), there is no convincing evidence of an association between net-of-market returns on divestiture announcements and (a) the seller's financial condition, or (b) the operating performance of divested assets, but there is a suggestion that divested assets are loss-making. These questions therefore remain open even at a descriptive level. However, from the perspective of the present study, all of these studies fail to separate efficiency from financing motives. An outstanding issue is whether firms with agency problems (which are probably reflected in below-average operating performance) divest poorly-performing assets for financing reasons more or less frequently than efficient firms divest poorly-performing units (and not for financing reasons). Buyers are expected to be more efficient operators than sellers in either case (though they may overpay if afflicted by agency problems themselves), but this does not rule out a financing motive for the asset sale in the first place.

According to LPS, the two cases may be distinguished by the disposition of the sale proceeds. Inefficient firms, whether the inefficiency is caused by operating inefficiency or agency problems, are likely to face demands for paying out sale proceeds, while efficient firms are expected to reinvest. The use of sale proceeds

has received little attention in the literature. Expectations on payouts by financially-distressed firms are first reviewed in order to benchmark the LPS position.

4.3   USE OF SALE PROCEEDS BY FINANCIALLY-DISTRESSED FIRMS

Firms in financial distress, as well as healthy firms, may sell assets to promote operating efficiencies. But for firms in financial distress, asset sales may also be an important source of cash because access to capital markets is likely to be expensive. Asset sales for such firms effectively are a mechanism by which debtholders reduce the extent of managers' discretion. Brown, James and Mooradian (1994) argue that when a firm is (known to be) in financial distress[5], the liquidation value of the firm's assets is likely to be less than the face value of the firm's liabilities. In this case, the only equity value is the option value associated with a potential increase in the value of the firm's assets. Shareholders therefore have little incentive to sell assets and give the proceeds to creditors because the shareholders lose the value of any growth options attaching to the divested assets. Brown, James and Mooradian suggest that pressure from short-term senior lenders is critical. If asset sales by distressed firms are likely creditor-driven, then the stock price response is expected to be at least zero, or even negative.

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[5] Financial distress is defined (fn. 7, p. 239) to occur when assets are sold to remedy or avoid a (debt) default. Asset sales by firms already in bankruptcy were excluded.

In contrast, when distressed firms retain their sale proceeds, Brown, James and Mooradian argue that the firm's equity does not lose its option value, so the stock price response to reinvestment is expected to be greater than the stock price response to a payout. The authors do not elaborate the point, but the argument implies the distress is temporary, for if the managers of the distressed firm can add value to the reinvested sale proceeds, they must either be efficient (and able to seize growth opportunities) or any agency problems must be minimal. This makes sense, for if these problems were present the creditors would immediately liquidate the firm. For instance, the authors note that distressed firms are unlikely to have a free cash flow problem. In fact, retention itself may signal the equity market that the firm has valuable growth opportunities with respect to the remaining assets, given that creditors have not moved to liquidate the firm. Hence, when distressed firms pay down debt with asset sale proceeds, a wealth transfer from shareholders to debtholders is expected to the extent early repayment of debt claims was unanticipated[6].

Brown, James and Mooradian report corroborating evidence. A logistic regression of a binary payout variable on a set of financial ratios is highly successful. The likelihood of payout is found to be significantly increasing in all debt measures employed, and decreasing in the market-to-book ratio (representing future investment opportunities) and industry profitability (representing asset market

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[6] The valuation effects of asset sales by distressed firms also depend on the anticipated success of the disposal in resolving the seller's financial problems.

liquidity). [-1, 0] abnormal equity returns average 2.14 per cent for distressed firms'

announcements, compared with -2.33 per cent for bankrupt firms; both results are

statistically significant[7]. All significance is achieved at conventional levels. When

the [-1, 0] abnormal stock returns are regressed on a similar set of financial ratios,

significance (but only at the 10 per cent level) is achieved on the payout, interest

coverage and subsequent bankruptcy variables.

As a consequence, opposite expectations on the stock price response to payout or

reinvestment of sale proceeds are implied for non-distressed firms. These

expectations are in fact consistent with the LPS position, where retention by firms

with significant agency problems is not in shareholders' interest.

Shleifer and Vishny (1992) stress the importance of debt overhang to investment and

financing decisions. Distressed firms are more likely than healthy firms to

experience this condition. Short-term debt overhang occurs when current period

cash flow from operations cannot cover debt obligations (interest and any repayment

of principal) due in the same period, that is, those obligations carried over from the

previous period. Debt overhang problems make security issues costly, because

investors know that their subscription will be used to remove the overhang before

funding investments. For firms already known to be in distress, announcements of

asset sales to raise finance are therefore expected. Debt overhang signals a payout

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[7] The [-1, 0] abnormal returns for the entire sample were 0.01 per cent, which was not
statistically significant.

to debtholders. Should no debt overhang be present, an announcement on how management plans to use sale proceeds *may* convey information. Given distress, retention (payout) should be good (bad) news for shareholders.

4.4 THE FINANCING HYPOTHESIS OF LPS

LPS postulate that asset sales may be made for financing reasons as well as efficient redeployment. Efficient firms receive more favourable terms than inefficient firms (including those with agency problems) when visiting the capital market to finance their investments. The efficiency hypothesis assumes that managers maximise shareholder wealth, while the financing hypothesis does not, so agency costs are borne by shareholders[8]. The agency problem is stated only in general terms:

> "[T]he financing hypothesis assumes that management pursues its own objectives and, more specifically, values control and firm size. Since it values firm size, management has little incentive to sell assets unless it needs to raise funds and cannot do so cheaply on capital markets. Management may have to raise funds to reduce financial distress costs, to pay dividends to shareholders to prevent a takeover, or to undertake investments that it values but shareholders do not." (p. 5).

Empirical support for the financing hypothesis may therefore also be construed as evidence of the generality of agency problems. LPS mention agency costs of debt (underinvestment and asset substitution) and agency costs of new equity

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[8] Since, in equilibrium, operationally inefficient firms do not survive, the source of this inefficiency must be more costly for shareholders to remove than the foregone savings from cheaper access to capital markets, which suggests agency problems.

participation (adverse selection and managerial discretion). Underinvestment occurs when managers do not undertake positive NPV investments because most of the value added to firm value accrues to debtholders (or a new generation of debtholders). This typically occurs when debt levels are already high, so that the introduction of a new asset improves debtholder wealth proportionately more than the value of equity[9]. Asset substitution takes place when managers invest in an asset whose returns are riskier than disclosed to debtholders when a loan is negotiated[10]. Shareholders benefit from higher variance investments because their limited liability truncates the loss distribution; consistent with Modigliani and Miller (1958) this is at the expense of debtholders whose claim is fixed. In short, debtholders prefer low variance investments. Both underinvestment and asset substitution raise the cost of external finance.

Adverse selection occurs when investors discount the offer value of a firm's securities because they infer a lower value of the firm's assets due to an unobserved probability of the firm having a low value[11]. An asset sale potentially avoids this discounting: sales of marketable or liquid assets in particular carry a lower risk of adverse selection than sales of the firm's securities. The costs of managerial discretion are quite general. These range from the existence of free cash flow to any

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[9] See Myers (1977).

[10] Asset substitution is described by Jensen and Meckling (1976).

[11] See Akerlov (1970); adverse selection costs are modelled by Myers and Majluf (1984).

decision not made entirely in shareholders' interest. Jensen (1988) defines free cash flow as cash flow remaining after all profitable investment opportunities have been taken up. Firms that retain their free cash are therefore investing in negative present value opportunities, which reduces claimholders' wealth given the amount should otherwise be paid out to allow for profitable reinvestment on the capital market.

Self-interested managers may prefer to raise funds to exercise their discretion. This includes, for instance, reduction of financial distress costs by paying down debt, paying large dividends to thwart a hostile takeover, or to undertake entrenching or other investments preferred by the managers themselves. The costs of manager entrenchment, as modelled by Shleifer and Vishny (1989), offer perhaps the closest analogue to agency problems in a divestitures context because, unlike the other agency costs, disposals of assets no longer valued by managers directly enter divestiture activity. Entrenched managers are efficient in relation to a restricted set of activities, but the restriction is set by the managers themselves. Their entrenchment follows from the fact that no alternative management team could preserve the value of the assets subject to their control. Hence, only assets suiting their skills and experience are acquired, and assets which are more efficiently managed outside the firm are sold off, notwithstanding that shareholders would have preferred retention of the assets in the hands of efficient managers. This might mean that assets with valuable growth opportunities and preferred by shareholders may be divested, while assets with fewer opportunities but preferred by managers may be

retained. Any reinvestment of the sale proceeds is subject to the same costs of managerial discretion as was the divested asset.

In addition, funds from asset sales carry potentially fewer restrictions on managerial discretion than funds raised subject to terms and conditions on the capital market. Note a paradox: asset sales for this reason are consistent with efficient redeployment, but the use of the sale proceeds (say) to acquire entrenching assets reflects an underlying agency problem. This insight is at the heart of the LPS position.

The proposition of Boot (1992) that self-interested managers have an incentive to defer selling assets beyond the time when shareholders would have sold is pertinent. This is another agency cost, and is closely related to the entrenchment argument. By selling assets after their resale value has fallen, managers are imposing a cost on both shareholders and debtholders, and the same propensity for loss attaches to all remaining assets. At the same time, entrenched managers have no incentive to sell assets at prices below present value, unless the agency problems are sufficiently severe.

Retention of the sale proceeds from asset sales by self-interested managers signals investors that the returns from reinvestment will be reduced according to the extent of agency costs. Thus, the good news of finding a buyer at a worthwhile price is offset by the expectation of inefficient reinvestment. The stockmarket therefore

discounts the retention of sale proceeds because in the presence of managerial

discretion shareholders do not capture the full value of asset sales. Payout firms are

expected to have (a) higher leverage than reinvest firms, and (b) poorer financial

performance, for otherwise funds could have been raised through capital markets.

Despite this, their stock price reaction should be positive because the agency costs

of managerial discretion have been reduced by removing some assets from

managers' control[12]. If leverage is already high, managers can avoid the costs of

possible financial distress by selling assets and paying out the sale proceeds to

debtholders[13]. Managers valuing size and control have little incentive to payout

proceeds to shareholders in the absence of pressures from the market for corporate

control.

LPS construct a sample comprising asset sales other than in the ordinary course of

business from 1984 to 1989, as required by the 8K forms of the Securities and

Exchange Commission (SEC). All asset sales that are part of a sell-off programme

are excluded. To minimise pressures from the market for corporate control to

divest, further deletions are made for firms actually in default[14], in a corporate

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[12] LPS (p. 14, Table 3) report a median abnormal return for [-5,5] of 4.42% for payout firms, but only 0.25% for the reinvest group. Their median for both groups combined is 1.70%, which is closely similar to the average abnormal returns of 0.5% and 1.66% reported by Hite, Owers and Rogers (1987) and Jain (1985), respectively.

[13] LPS, p. 8 find only five cases of payouts to shareholders compared with 35 to debtholders.

[14] Default on liabilities, such as interest payments, repayments of principal, or amounts owing to trade creditors or tax authorities, is not bankruptcy, but may be a trigger for bankruptcy and hence liquidation of the firm.

control contest, in bankruptcy (that is, liquidation), or in the midst of restructuring.
By implication, any firms potentially in financial distress were retained in the sample.
Nine firms defaulted on or renegotiated debt in the year before the divestiture, and
two did so in the year after. Although asset sales down to $1 million were included,
LPS' sample is dominated by large divestitures relative to the size of the seller,
because the median asset sale is 23 per cent of the selling firm's equity. For testing
purposes, the sources of agency costs are not directly identified. Payout intentions
are taken from the financial press; payout firms disclose their intention less
frequently than reinvest firms (18/40 *versus* 44/53).

The median firm sampled is a poorly-performing firm with a net income of about
zero, and a negative net-of-market return[15] over the year preceding the
announcement date. Over both two-day [-1, 0] and eleven-day [-5, 5]
announcement windows abnormal equity returns are significantly positive for the 40
divestitures by payout firms[16], as hypothesised. However, for the 53 reinvest firms
the abnormal returns are insignificantly different from zero. The median returns
were 1.90 per cent for the two-day window, and 4.42 per cent for the eleven-day
window (refer their Table 3). Since the efficiency hypothesis predicts a positive

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[15] The net-of-market return is computed by LPS (p. 12) as the firm's return *minus* the market's
return over the period [-250, -5].

[16] Firms paying out proceeds of asset sales comprised both those announcing their intention and
those not. In the latter case, investors were assumed rationally to expect the pay out. Five
(potentially anomalous) cases of payouts to shareholders were included with 35 cases of payouts
to debtholders because the proceeds were not reinvested in the firm.

market response irrespective of the use to which sale proceeds are put, they conclude that the financing hypothesis is a superior explanation of observed shareholder wealth effects.

4.4.1 EXTERNAL THREATS TO THE FINANCING HYPOTHESIS

LPS recognise several possible external threats concerned mainly with controlling for intervening variables. The possibility that payouts are made for share repurchases or special dividends is discounted upon examination of their transaction base. Other threats are suggested by (a) high managerial share ownership, and (b) poor operating performance of the divested asset. Either may be confused with agency problems. Each is now discussed in turn.

High proportions of managerial ownership of equity necessarily align managers' interest with shareholders', so the likelihood of agency problems is commensurately reduced. In other words, given high managerial ownership, retention of sale proceeds is in shareholders' interest. Thus, for the LPS position to hold, low managerial ownership levels are therefore required, particularly for reinvest firms. LPS report managerial share ownership levels of 11 per cent for reinvest firms and 17 per cent for payout firms, which appears tolerable given that control holdings are typically in excess of 30 per cent[17]. LPS also document that managerial ownership

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[17] LPS, p. 11.

fails to achieve statistical significance in regressions of abnormal equity returns on selected firm and sale characteristics across either announcement window[18].

The other difficulty faced by LPS in attributing their results to a financing rationale is that payout firms generally under-perform reinvest firms prior to divestiture, so asset sales for this reason could equally be consistent with efficient redeployment. LPS' Table 2 shows that payout firms have significantly lower interest coverage and higher leverage than reinvest firms, while all performance measures, including Tobin's q, are significantly inferior as well. LPS defend their position by dividing their sample into four mutually exclusive groups: payout or reinvest by poor or healthy performance. The eleven-day abnormal return is more consistently positive, but only just, for the two payout groups (split according to performance) than for both poor-performance groups (split according to payout/reinvest) (refer their Table 5). To guard against poorly-performing payout firms exhibiting positive abnormal returns owing to imminent financial distress, abnormal returns are also reported for payout and reinvest firms with above- and below-median interest coverage (refer their Table 4). These returns are found not to differ significantly for payout firms with above- and below-median coverage ratios, so it is concluded that the relation between abnormal returns and the use of proceeds does not depend on the selling firm's financial situation.

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[18] LPS, p. 20.

At least two further threats, not recognised by LPS, may be identified. The first is suggested by an observation of Smith and Warner (1979, p. 127), that bond covenants often require the proceeds from the sale of collateralised assets to be used to pay down debt. In other words, not all payout decisions are voluntary. However, collateralised assets can only be sold with the intention of paying down the debt secured on those assets, so the decision to payout is implicit in the decision to sell an asset, which is voluntary.

The second threat is posed by the possibility of different taxation treatments according to whether sale proceeds are reinvested or paid out. For example, heavier taxation of reinvestment than payout may generate return predictions similar to the LPS argument, but clearly not on the basis of agency problems. This would occur if capital gains (from retention) were taxed at a higher rate than dividend payments, in the hands of investors. On balance, this is unlikely because capital gains in Australia are measured after inflation, whereas dividends and interest are taxed in full as income, and roughly on a par given operation of a system of near-full imputation of company tax[19].

LPS (pp. 17-18) briefly address other characteristics associated with asset sales. Of interest here is the effect on abnormal returns of (a) a focus on core activities, and (b) sale of unprofitable divisions, both for reinvesting firms. Only the [-5, 5]

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[19] The complex interactions between the two complementary taxation systems and shareholder clienteles and their preferences are addressed in Bishop, Crapp, Faff and Twite (1993, ch. 16).

abnormal returns for (b) were significantly different from zero. In contrast, the payout sub-sample consistently exhibited positive abnormal returns. Hence, the positive market response is attributed to payout, and not to alternative reinvestment strategies.

LPS (pp. 19-21) also explore the possibility of a size effect in conjunction with the payout characteristic. In comparison with reinvest firms, firms paying out sale proceeds are found (see their Table 1) to have relatively larger asset sales, and also higher positive abnormal returns. LPS attribute the positive returns to payout status because the size factor is argued to generate negative abnormal returns, for two reasons. First, following Shleifer and Vishny (1992), illiquid asset markets imply credit-constrained buyers, so large asset sales require deeper discounts than small asset sales. The second reason is that the financial needs of the seller are more likely signalled by large rather than small asset sales. Large asset sales signal not only the gain made by the seller on the transaction, but also could signal lower than expected earnings or difficulties in accessing capital markets. Hence, if large asset sales signal a higher potential for financial distress, larger asset sales should attract more negative stock market responses than smaller asset sales. Asset sale programmes are also likely to signal the firm's condition relative to uncoordinated sales, but these are excluded from the LPS sample. LPS attribute the positive coefficient on transaction size to the release of information solely about the transaction price. Thus, for example, if illiquidity is increasing in size, larger asset sales should have higher positive abnormal returns.

Since the size variable (measured by the ratio of sale proceeds to the beginning-of-period value of the seller's equity)[20] is positively signed, LPS omit the variable from subsequent regressions of announcement-period abnormal returns for [-1, 0] and [-5, 5] on selected firm and sale characteristics. These invariably show a significantly positive payout dummy when most other explanatory variables are not, so the payout explanation for observed positive returns is preferred. The other explanatory variables include proxies for the agency costs of managerial discretion: namely, the proportion of managerial ownership, Tobin's q (representing growth opportunities), net-of-market [-250, -5] cumulative abnormal returns (representing relative efficiency) and long-term leverage representing agency costs of debt). Only the net-of-market [-250, -5] cumulative abnormal returns achieve statistical significance, when the announcement window is [-5, 5]. In short, LPS fail to establish a direct link between abnormal equity returns and proxies for the agency costs of managerial discretion.

In summary, LPS argue that when proceeds from asset sales are paid out (whether to debt or equity claimants), positive abnormal returns are expected because reinvestment is subject to the agency costs of managerial discretion. By corollary, retention of sale proceeds should attract a negative stock price response. They report supporting evidence based on a sample of large, non-programmed asset sales. Stock-price reaction is found to be significantly more positive for firms planning to

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[20] The possibility that high values of the ratio is driven by a smaller denominator rather than a larger numerator, suggesting small seller size and not large divestiture size, is discounted by LPS (p. 19) by reference to their descriptive data.

pay out their sale proceeds than for firms planning to reinvest. However, direct empirical evidence of the relation between abnormal returns and proxies for agency costs eludes the authors.

LPS (p. 22) recognise that asset sales potentially convey information about (a) the value of the asset sold, (b) the intended use of the proceeds, and (c) the firm's financial condition. All asset sales potentially signal (a) and (b), while large asset sales are likely to signal (c) as well. Furthermore, asset sales are often an important part of broader debt- and asset-restructuring plans, so the valuation effects of large asset sale announcements may also reflect the anticipated success of outstanding restructuring processes. LPS therefore specifically recommend testing their financing explanation on a larger sample of smaller asset sales in the hope of eliminating (c) as a confounding factor.

4.5   EMPIRICAL EVIDENCE ON THE FINANCING HYPOTHESIS

JO (p.121) appear to have been the first to test LPS' financing hypothesis. The mean abnormal return for a sub-sample of firms planning to repay debt with sale proceeds is found to be significantly positive (2.6%), but this is inconclusive because the figure for reinvesting firms is not reported. The remainder of their brief analysis is dismissive of the LPS position. The determinants of the positive abnormal returns are explored by regressing sellers' abnormal equity returns on a set of focus

variables plus size and payout. Without reporting their results, JO observe that the payout variable has no incremental explanatory power beyond that of increasing focus. They also report, again without tabulating their test results, no significant difference in post-divestiture performance between firms that used proceeds to repay debt, and those that did not, which suggests the superior returns of focus-increasing firms are unaffected by any agency problems affecting selling firms. This interpretation, however, is premature because the performance measure might be affected by financing charges as well as operating expenses, and also the price paid which could in turn be influenced by agency problems afflicting buyers.

4.6   CHAPTER SUMMARY

A need for cash suggests poor pre-divestiture performance either of the divested asset, or the firm itself. The paucity of evidence is not conclusive, but is also not capable of distinguishing between the efficiency and financing explanations. The financing hypothesis of LPS is explicated and differentiated from a financing rationale for asset sales by financially-distressed sellers and disposals of under-performing assets. The essence of LPS' financing hypothesis is that reinvestment of sale proceeds is bad news for shareholders when reinvestment is subject to the costs of managerial discretion, whatever the form of this agency problem. No firm size argument is specified. LPS' own evidence centred on stock price responses according to payout/reinvest partitioning is strongly supportive, despite the fact that

agency costs are not directly measured in any of their model estimations. Based on a sample of large, non-programmed asset sales, the stock price response is found to be significantly more positive for payout than reinvest firms. Since financial distress is assumed already known in an efficient capital market, asset sales by distressed firms do not signal the financial condition of the seller. However, this remains a possibility with asset sales by healthy firms, especially if the divestiture is large relative to the size of the seller.

CHAPTER FIVE

HYPOTHESIS DEVELOPMENT

5.1 INTRODUCTION

This Chapter first formulates the key hypotheses for discriminating the competing efficiency and financing explanations. Three of these four hypotheses employ cumulative abnormal return metrics. The remaining hypotheses test expectations on relative divestiture size and relations between focus changes and efficiency arguments. Since abnormal returns are understood to be cumulative, this adjective to often deleted for brevity. Finally, models of the determinants of abnormal returns, focus changes and the payout/reinvest choice are estimated in order to lend perspective to the test results.

5.2 EFFICIENCY RATIONALE

An efficiency gain on divestiture occurs when the buyer is a more efficient user than the seller. Either negative synergies were present in combination with the seller's assets, or the combination with the buyer's assets yields a higher (risk-adjusted) return, or both. A pure efficiency rationale for divestitures is difficult to test in a world characterised by agency problems. Although managers presumably gain when

a divestiture is successfully completed, agency problems afflicting sellers mean that seller's shareholders may not always gain, while agency problems impinging on buyer's shareholders imply the gain to the seller is not limited to enhanced efficiency but could represent overpayment by the (successful) buyer. Buyers that are less efficient users than sellers should not be bidders, but may bid if sufficient managerial discretion exists to allow overpayment.

The possibility of overpayment is suggested more by theory than evidence. Roll (1986) conjectures a behavioural explanation for overpayment, termed hubris; Jensen (1986, p.328) conjectures that firms with "... large free cash flows are more likely to undertake low-benefit or even value-destroying mergers"; Shleifer and Vishny (1989) conjecture that entrenched managers will pay more for entrenching assets than their value in best use; and Shleifer and Vishny (1992, p. 1347) note that buyers not subject to long-term debt overhang have the capacity to overpay for acquisitions during prosperity[1].

The evidence is indirect, and equivocal. Lang, Stulz and Walkling (1991) report that bidders with high free cash flow and poor investment opportunities, as measured by low values of Tobin's q, suffer significantly negative returns when acquisitions are announced. More generally, Jensen and Ruback (1983) in their review of the U.S. evidence of wealth gains in relation to merger and acquisition announcements point

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[1] Persistent overpayment implies a rational bubble, where buyers know their forecasts are optimistic. For discussion on rational bubbles, see Blanchard and Watson (1982).

to substantially higher abnormal returns accruing to the shareholders of acquired companies, whereas the corresponding returns of acquiring companies usually do not differ significantly from zero. Similar findings are reported in Australia (see Walter (1984) and Bishop, Dodd and Officer (1987)). Divestiture-specific evidence suggests that overpayment is not rife. For announcement windows ranging from [-1, 0] to [-1, 1], Hite, Owers and Rogers (1987), Rosenfeld (1984) and Sicherman and Pettway (1992) all report significantly positive cumulative abnormal returns to both buyers and sellers. If overpayment were a problem, buyers' returns would be depressed by an efficient capital market recognising the overpayment. However, consistent with overpayment, sellers' cumulative abnormal returns are consistently higher than buyers' for the same divested asset (by less than one per cent over a two- or three-day announcement window), but the significance of the differences in these returns between buyers and sellers is tested only by Rosenfeld (1984, p. 1446), who finds none. In short, although incentives for overpayment must exist in a world dominated by agency problems, the evidence is at best mixed.

Given that the sale price may be inflated by overpayment, a high sale price does not necessarily represent the present value of enhanced returns from transfer of an asset to the buyer. Instead, the efficiency of the buyer relative to the seller is inferred from the average level of profitability or earnings of the divested asset in the hands of the buyer *vis à vis* the seller. Other things equal, when the profitability of the divested asset is higher in the hands of the buyer than the seller, an efficiency gain is inferred. A major advantage of this approach is that absolute levels of efficiency, in

the sense of risk-adjusted required returns, need not be specified[2]. This gain enables the buyer to bid a price higher than the present value to the seller. As a result, a positive abnormal return is expected when a divestiture is announced. Note that higher relative buyer efficiency subsumes divestment of poorly-performing units, that is, those assets or businesses with returns below the risk-adjusted required level. The efficiency rationale is independent of the payout decision, as well as the size of a divestiture relative to the seller's equity value before the divestiture.

The first efficiency-based hypothesis is now formed. Efficient redeployment should attract a positive market response, irrespective of the disposition of the sale proceeds. This and all subsequent hypotheses are expressed in the alternate form for ease of exposition.

Hypothesis 1 When buyers are more efficient users than sellers, cumulative abnormal equity returns on divestiture announcements are positive for both payout and reinvest divestitures.

As noted above, divestitures into equally or relatively less efficient uses by self-interested managers are possible. In order to induce a sale, buyers therefore must overpay. Overpayment depresses the returns from an acquisition: a buyer of the same efficiency as the seller will exhibit lower returns than the seller only by reason

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[2] Determining CAPM beta values for specialised businesses or assets would be difficult because most listed Australian companies exhibit some degree of diversification. Furthermore, divested assets typically finish up in different asset combinations compared with the seller's, with the result that some part of the beta change for the same divested asset is attributable to different unrelated activities carried on by both the seller and the buyer.

of overpayment. Agency problems are inferred present when the buyer is an equally or less efficient user than the seller, which is suggested when the average level of profitability or earnings of the divested asset in the hands of the buyer is equal to or below that of the seller. A major advantage of this approach is that the incentives of acquiring firm's mangers to overpay need not be measured directly. This approach overcomes a weakness common to all event studies examining divestitures, with the possible exception of Denning (1988)[3], in that the *pre*-divestiture operating performance of the divested asset is not modelled because reporting this information is not required by regulatory authorities in the U.S. and U.K.[4]. Since the sale price should be increasing in the expected return from the acquired asset, an efficiency rationale suggests the following relativity:

Hypothesis 2   Cumulative abnormal equity returns on divestiture announcements are higher when buyers are relatively more efficient users than when buyers are equally or less efficient users relative to sellers, for both payout and reinvest divestitures.

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[3] Even Denning (1988) models operating performance of the divested unit qualitatively, through directors' comments.

[4] For instance, 8K and 10K financial returns furnished to the SEC in the United States have no provision for the reporting of subsidiary performance data, unlike the requirement of the former *Companies Code* (Schedule 7, para. 10(1) and the present *Corporations Law* (Schedule 5, para. 38(2), (3)) in Australia.

Lack of empirical support for hypothesis 2 does not support an alternative financing

rationale (unless, as is discussed next, the abnormal returns of payout divestitures

exceed those of reinvest divestitures, without necessarily being positive).

5.3   FINANCING RATIONALE

Alternatively, LPS propose a microstructure of divestitures, conditional on the use

of the sale proceeds. They argue that the observed (albeit small) positive abnormal

returns mask an underlying structure that relies for its arguments on the proposed

(or expected) use of the sale proceeds. All firms are assumed characterised by

varying degrees of agency problems, which induce commensurate variation in

managerial inefficiency. The basic LPS proposition is that payout divestitures attract

a positive market response because the payout avoids the costs of managerial

discretion and lessens the risk of default or bankruptcy, the costs of which are

ultimately borne by shareholders as residual claimants. Shleifer and Vishny (1992,

pp. 1357-1358) add further benefits of selling assets to reduce debt. These include

alleviation of the risk of asset substitution, because creditors receive cash in lieu of

exposing themselves to the riskiness of the firm, and avoidance of transaction costs

in managing conflicts among creditors with competing claims.

When divestiture proceeds are expected to be paid out, the divestiture

announcement signals that managers cannot raise funds from capital markets more

cheaply than through selling assets. The divestiture should at the same time signal

the purpose of the sale, which may be to retire some outstanding debt, sell "crown-jewels" to prevent a hostile takeover, or undertake entrenching investments. Sellers needing to raise cash from asset sales may in fact offer a sufficiently large discount to enable less efficient users to bid for the asset. However, notwithstanding agency problems, LPS (pp. 5-6) argue that managers do not sell assets below present value. Hence, an asset sale should be good news (that a price above present value has been obtained), even if the motive for the sale is bad news, in the sense that debt or equity issues are more expensive because suppliers of capital have a more pessimistic view of the firm's operating prospects than managers[5].

LPS posit a negative stock price reaction for reinvestment when the sale proceeds are used to further managers' interests at the expense of their shareholders; that is, some of the proceed are effectively wasted. This reaction is likely to be more negative as agency problems (for instance, entrenchment) are more severe. When managers are efficient, the stock price reaction to reinvestment should be positive, because efficient managers are expected to pay out sale proceeds if there are no positive NPV investments available. Hence, in the LPS framework, the sign and degree of the market response to reinvestment is an indication of the pervasiveness and extent of agency problems. Conversely, payout divestitures are expected to be

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[5] It is necessary to assume that managers cannot remove the blockage in access to capital markets by full disclosure of their privately-held information because capital suppliers cannot be sure that all information has been released, perhaps owing to recent experience with the incumbent management team.

received "more favourably"[6] by shareholders. Empirically, LPS find a positive market response to payout divestitures, which is consistent with expectations formed on the small positive abnormal returns widely documented for divestiture announcements in general. In fact, this return should be marginally higher than the average, given a negative market response for reinvestment.

Although LPS document significantly positive abnormal equity returns for payout firms, it is sufficient that the abnormal returns of payout divestitures exceed those for reinvestment. Predictions of absolute positive and negative stock price reactions, respectively, are argued to be too severe a test of the financing hypothesis, for two reasons. First, a negative stock price response to reinvest divestitures depends on the degree of agency problems characterising the seller, which may not be sufficiently costly to the shareholders to induce a negative abnormal return on announcement. On average, a negative response is unlikely because agency costs large enough to induce wealth losses on investment must ultimately result in the removal of management or liquidation of the selling firm. Second, the case for a positive market response to a payout divestiture is problematic. On the one hand, efficient down-sizing (in the sense of Jensen (1989)) benefits shareholders because funds are repatriated (to debtholders or shareholders, or both) when profitable investment opportunities are lacking. On the other hand, a payout to debtholders following an asset sale reduces the option value of equity claims, especially if the

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[6] LPS (1995, p. 6).

most valuable assets or those bearing valuable growth opportunities are sold. This is essentially the argument advanced by Brown, James and Mooradian (1994) in forming an expectation of a negative stock price response to payouts by firms already in financial distress. Since LPS obtain a positive stock price response to payouts, their sample presumably contains few or no firms experiencing distress, consistent with their claim (LPS, pp. 16-17)). Hence, a prediction of positive abnormal returns for payout divestitures is sensitive to the extent to which sellers are close to financial distress, without necessarily being in distress.

In contrast to LPS, Brown, James and Mooradian (1994) predict a positive stock price response for reinvestment by distressed firms because this action signals creditors' consent, who by implication have not demanded to be paid out. It is important to realise that asset sales in the LPS framework are management-inspired (by managers valuing size and control), in contrast to situations of financial distress where asset sales are more likely debt-driven. Financially-distressed firms are therefore excluded from the sample used in the present study in order to establish the most favourable conditions for testing the LPS propositions *vis à vis* those of the alternative efficiency rationale.

Payout divestitures are expected when sellers cannot raise debt or equity finance more cheaply. Such divestitures do not signal liquidity problems because the seller's financial position is already known in an informationally-efficient market. Rather, the need to sell assets to raise finance suggests that payout sellers, unlike reinvest

sellers, are not in a position to raise further debt or equity capital on favourable terms, and may even need to sell at a discount to resolve their agency problems. Prior to divestiture, payout sellers should be characterised by inferior operating and financial ratios than reinvest firms, which by implication enjoy ready access to debt and equity markets. Relative to reinvest sellers, payout firms are expected to have inferior operating performance, higher leverage and inferior interest coverage in the year prior to divestiture[7].

Hypothesis 3   Payout sellers have lower operating performance, higher leverage and lower interest coverage in the year prior to divestiture than reinvest sellers.

The LPS position is that payout (reinvest) divestitures are hypothesised to generate positive (negative) abnormal returns, irrespective of the buyer's efficiency relative to the seller. The financing hypothesis is stated in a form that permits differentiation from the competing efficiency explanation:

Hypothesis 4   Cumulative abnormal equity returns on divestiture announcements are higher for payout than reinvest divestitures, both when buyers are more and less efficient users than sellers.

Lack of support for this hypothesis is not sufficient to endorse the alternative efficiency rationale. However, the payout choice and wealth gains by buyers could be systematically related. To the extent that an intended payout signals a debt

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[7] Closer proximity of these variables to the divestiture date is not possible because all involve accounting measures from the previous year's annual report.

problem, which is contrary to LPS' (1995) position, a "bargain buy" is possible, probably by competitors with low information and hence adverse selection costs. Managers desperate to retain their jobs may even sell below present value if the benefits accruing to themselves are worthwhile. Thus, observation of a reversed inequality to that hypothesised suggests that a payout decision is a signal to potential buyers of a lower than expected purchase price. Multiple or competing bids may erode but will not eliminate all the discount, so a lower sale price is received by the seller.

5.4   SUMMARY OF HYPOTHESES 1, 2 AND 4

Table 5.1 summarises the arguments of hypotheses 1, 2 and 4, which are essential to discriminating the competing financing and efficiency explanations. These hypotheses suggest sufficient rather than necessary conditions. For example, in Hypothesis 1, relatively more efficient buyers than sellers is a sufficient condition to generate positive cumulative abnormal returns, but the possibility remains that the latter may also be caused by other factors not identified here. Cross-sectional dependency would seem to represent the largest threat. This could occur, for example, if transactions tended to occur immediately before a series of (at least two) years of economic prosperity, and all buyers shared in the prosperity. However, the possibility is virtually ruled out by the sample period used in this study, which comprises a mix of recessionary and prosperity years in the sample period used in

this study[8]. In the absence of systematic influence by factors not related to efficiency, variability in abnormal returns for reasons other than efficiency is assumed to occur randomly, that is, represent noise. Hence, there should not be an omitted variables problem whereby the tests of these hypotheses would have been weakened in their power to reject the null.

Table 5.1

Hypothesised signs/inequalities of sellers' cumulative abnormal equity returns on divestiture for the payout/reinvest choice by relative buyer efficiency. Buyer efficiency (E_B) is expressed relative to seller efficiency (E_S) for the same divested asset.

Payout status	Cumulative abnormal return (CAR) on divestiture announcement	
	$E_B > E_S$	$E_B \leq E_S$
Hypothesis #1 (efficiency)		
Payout	positive	no prediction
Reinvest	positive	no prediction
Hypothesis #2 (efficiency)		
Payout	$CAR[E_B > E_S] > CAR[E_B \leq E_S]$	
Reinvest	$CAR[E_B > E_S] > CAR[E_B \leq E_S]$	
Hypothesis #4 (financing)	$CAR[payout] > CAR[reinvest]$	$CAR[payout] > CAR[reinvest]$

[8] The sample period straddles the late 1980s and early 1990s, in which few years would be regarded as "prosperity".

5.5   RELATIVE DIVESTITURE SIZE

It is possible to complement the preceding hypotheses with a divestiture volume argument, where volume represents the aggregate value of divestitures by the selling firm per period. Efficiency requires that firms with poor growth prospects (but not in financial distress) are expected to sell assets to pay off debt as the firm down-sizes.

On the other hand, firms with valuable growth opportunities can raise external finance, so do not have to sell assets, let alone pay down debt, because debtholders are willing to accept their current risk exposure. Both the relative size of divestiture and the proportion of payouts should therefore be decreasing in the degree of growth opportunities. Distress sales are consistent with efficient redeployment, where payout to debtholders is predicated by distress; that is, managers have no discretion as to the use of the sale proceeds.

When agency problems are significant, sellers are assumed to correspond to the LPS description of firms governed by managers who value size and control. These managers are likely to be entrenched, control free cash flow, and operate with debt levels that are not high enough to threaten their entrenchment in the event of abnormally low earnings, but high enough to impede borrowing (or issuing equity) on favourable terms, so asset sales become necessary for financing purposes. Since optimum leverage varies from firm to firm depending on the industry and the degree

of agency problems[9], leverage levels are not an explanatory variable. A financing rationale is silent with respect to the efficiency of buyers relative to sellers, so efficiency arguments cannot be used in setting up expectations. Payout divestitures should be relatively infrequent because self-interested managers should be unwilling to sell entrenching assets except when their entrenching value declines, or external finance becomes too expensive as a consequence of the high agency costs. Firms characterised by high agency costs may have either high or low growth opportunities depending on their industry and market power, but even if these opportunities are high much of the potential added value is lost to self-interested managers. Hence, such firms' growth prospects should, on average, be low.

The efficiency and financing explanations are therefore differentiated only in low growth scenarios, where divestiture rates and payout proportions should be higher for efficiency-driven divestitures than financing divestitures. Abnormal returns on divestiture announcements are used to distinguish efficiency-driven divestitures from those made for financing purposes, but only for the reinvest sub-sample. Payout divestitures do not possess as much discriminating power because a positive market response can be due either to (a) efficient down-sizing of the sellers, or (b) inefficient managers paying down debt or even returning capital (that is, a financing explanation). On the other hand, reinvest divestitures attract a negative market response when managers are inefficient (or entrenched), and a positive response

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[9] See Jensen and Meckling (1976).

when managers are efficient. The hypothesis is stated in terms of an efficiency explanation.

Hypothesis 5   For reinvesting sellers with below-median growth prospects, the relative size of divestitures with a positive market response on announcement exceeds the relative size of divestitures with a negative market response.

An absence of a significant difference in relative divestiture size between the two groups necessarily fails to resolve the test in favour of either explanation. A count of the signs of the abnormal returns is proposed to resolve any impasse. If there are more (fewer) positive than negative abnormal returns, then efficiency (inefficiency) is implied, in the sense that assets are divested to relatively more efficient buyers. Acceptance of an efficiency explanation precludes a financing explanation.

5.6   FOCUS-RELATED HYPOTHESES

Focus arguments represent empirical regularities and prescriptions from the corporate strategy literature. There is no theory which predicts an optimum range of activities for a firm, or the optimum degree of relatedness between those activities. Nevertheless, focus arguments are here afforded the status of hypotheses for testing purposes. Focus arguments are predicated on the assumption that efficiency gains (losses) are attributable at least in part to increases (decreases) in relatedness

between operating activities. The main sources of gains from focus increases include the sharing of joint inputs (a better "fit")[10], and removal of activities having negative complementarities. A further source is suggested by the transaction cost minimisation arguments of Williamson (1988), whereby control in terms of administrative efficacy is presumably enhanced when an asset portfolio comprises a set of related, rather than unrelated, activities.

Focus increases are not an exact analogue for efficiency improvements. From the seller's perspective, agency problems suggest that self-interested managers may choose to retain assets not preferred by shareholders, such as entrenching or low-risk assets to preserve their control. The assumption that core activities are the most profitable is widespread in the corporate strategy literature[11]. Although agency problems represent a potentially major exception, the survival through time of core activities in the face of competitive capital markets suggests these should be efficiently run[12]. There are also some measurement problems. Disposals of assets related to the core activities do not reduce focus (but only size) if there are no unrelated activities in the first place, which is usually difficult to determine. Hence, focus changes are at best a noisy indicator of efficiency changes, so are probably not

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[10] The benefits of improved fit include scope economies, where unit production cost in aggregate becomes lower as more products are added.

[11] A useful summary in the present context is provided by Weston, Chung and Hoag (1990, chs. 3, 7 and 9).

[12] This argument is founded on the survivorship principle, formulated by Stigler (1958), that competitive pressures ensure that only profitable activities survive in the long-term.

efficacious in discriminating the financing and efficiency hypotheses. Nevertheless, focus is a parallel concept in the strategy literature, and the relation between shareholder wealth changes and focus changes is of empirical interest.

Three hypotheses specifying buyer as well as seller characteristics are suggested by the empirical regularities documented by JO:

Hypothesis 6   Sellers' cumulative abnormal equity returns on announcement are higher when assets are sold to buyers having activities related to the divested asset, than when they are not.

Hypothesis 7   Sellers' cumulative abnormal equity returns are (a) highest for divestitures unrelated to sellers' other activities and related to buyers' other activities (that is, relatedness-increasing), and (b) lowest for divestitures related to sellers' other activities and unrelated to buyers' other activities (that is, relatedness-decreasing).

Hypothesis 8   The increase in *post*-divestiture profitability of divested assets with *pre*-divestiture profitability below their industry median exceeds that of divested assets with *pre*-divestiture profitability above the industry median.

Two further hypotheses suggested by JO not specifying buyer characteristics are also tested, and require no further elaboration:

Hypothesis 9   The profitability of sellers following a focus-increasing divestiture is higher than that of sellers following focus-decreasing divestitures.

Hypothesis 10   Sellers' abnormal equity returns on announcement of focus-increasing divestitures are (i) positive, and (ii) exceed those of sellers with focus-decreasing divestitures.

Efficient managers are differentiated from non-efficient managers in an attempt to explicate the relation between efficiency and relatedness. Consistent with LPS, inefficient management is inferred when retention of sales proceeds causes a negative market response. The inefficiency can be caused either by operating inefficiencies (including negative complementarities) or by agency costs in the form of entrenchment, free cash flow, and the like. However, a positive market response to payout is expected only when assets are removed from the control of inefficient managers; efficiently-managed firms paying down debt (or reducing equity via share repurchases and the like) in the absence of profitable investment opportunities should exhibit zero market response. Inefficiently-managed firms may be expected to show poor returns and commensurate growth prospects, while efficiently-managed firms should be above-average performers with superior growth prospects. A negative response to payout implies an asset sale forced by senior creditors in distress conditions, but since the sample design excludes most or even all such disposals, it is not possible to benchmark the characteristics of payout firms with positive market responses.

Reinvestment offers more scope for differentiating efficiency and financing arguments. Efficiently-managed firms are identified by having a positive market response to retention. These firms are hypothesised to sell assets irrespective of relatedness; that is, assets are sold whenever a buyer bids above present value. This is more likely when the *pre*-divestiture performance of the divested asset has been poor: likely on a par with the performance of similar assets by inefficiently-managed firms, and certainly inferior to the profit contribution generated by the buyer. In contrast, inefficient managers are hypothesised to sell unrelated assets not because these are less profitable than core assets, but because they are less effective entrenching vehicles. The *pre*-divestiture efficiency of divested assets may therefore be quite adequate, but the growth prospects of firms characterised by entrenched managers should be lower than those of efficiently managed firms which are not constrained by agency problems.

Hypothesis 11   Relative to reinvest firms with negative abnormal returns around divestiture announcements, reinvest firms with positive cumulative abnormal returns around divestiture announcements (i) sell lower proportions of related assets, (ii) report lower *pre*-divestiture performance of divested assets relative to *post*-divestiture performance, and (iii) have higher growth prospects.

Lack of empirical support for this hypothesis militates against an efficiency explanation for the hypothesised inequalities, but does not necessarily imply support for an alternative financing explanation because reinvest firms with agency problems

(suggested by negative abnormals around announcement) may not be characterised by the reverse conditions of (i), (ii) and (iii).

The possibility remains that payout/reinvest decisions are the natural result of focus adjustments to improve efficiency, rather than a reflection of underlying agency problems. Payouts could be associated with stock price increases due to an association with focus increases, that is, sales of unrelated assets. This combination is consistent with efficient down-sizing, where a firm repatriates capital which it cannot profitably reinvest. Such firms have below-average growth prospects, and a zero market response is expected. Focus increases may therefore signal managers' commitment to restore profitability to the firm's core assets. On the other hand, sellers with favourable growth prospects are expected to reinvest, attracting a positive market response. Two related hypotheses are therefore proposed.

Hypothesis 12 Firms increasing their focus as a result of divestiture and with low growth opportunities (i) pay out the sale proceeds, and (ii) have zero cumulative abnormal returns around the divestiture announcement.

Hypothesis 12A Firms increasing their focus as a result of divestiture and with high growth opportunities (i) reinvest the sale proceeds, and (ii) have positive cumulative abnormal returns around the divestiture announcement.

The preceding hypotheses are compatible with an efficiency explanation due to specifying the conditions of (a) focus-increasing divestitures, and (b) availability of growth opportunities (which should be increase with a firm's efficiency), and imply abnormal returns opposite in sign to those predicted by a financing explanation.

Focus decreases coupled with reinvestment of sale proceeds are not expected if assets are already in their most efficient use, but are compatible with efficient redeployment if assets are no longer in their most efficient use. In the latter case, above-average growth opportunities should exist, so a positive market response is expected as a result of restructuring to capture these opportunities. Payouts may also be associated with focus decreases. Assuming that at any time most firms are not changing their core activities for efficiency reasons, payouts associated with focus decreases suggest distress sales of core assets, which should evoke a negative market response (see Brown, James and Mooradian (1994)). However, the sample is designed to minimise this possibility, so few payouts are expected to be associated with focus increases. Another pair of hypotheses is therefore proposed:

Hypothesis 13   Firms decreasing their focus through divestiture and with low growth opportunities (i) pay out their sale proceeds, and (ii) have a negative market response to divestiture announcements.

Hypothesis 13A   Firms decreasing their focus through divestiture and with high growth opportunities (i) reinvest their sale proceeds, and (ii) have a positive market response to divestiture announcements.

Again, the preceding hypotheses are compatible with an efficiency explanation, and imply abnormal returns opposite to those predicted by a financing explanation.

5.7   EXPLANATORY MODELS

Finally, to lend perspective to the test results, models of the determinants of divestiture announcement abnormal returns, focus changes and the payout/reinvest choice are estimated. The two latter variables are specified as binary dependent variables in logistic regressions on selected divestiture and seller characteristics, including agency cost proxies. Significance on explanatory variables is interpreted in terms of consistency with an efficiency or financing framework, as appropriate.

5.8   CHAPTER SUMMARY

Fifteen hypotheses have been formulated in this Chapter, embracing the efficiency (two), financing (three) and focus-change (ten) explanations for corporate divestitures. Hypotheses 1, 2 and 4 are critical for discriminating the efficiency and financing explanations. These hypotheses are summarised in Table 5.1. Essentially, the financing rationale requires an abnormal return on divestiture to be higher for payout than reinvestment irrespective of the efficiency of the buyer relative to the seller. In contrast, two regularities are specified for the efficiency rationale. The first is of positive abnormal returns when buyers are relatively more efficient than

sellers, irrespective of the disposition of the sale proceeds. The second expectation is that abnormal returns of relatively more efficient buyers are expected to be greater than those for buyers of less or equal efficiency relative to sellers, again irrespective of the disposition of the sale proceeds.

Apart from one expectation formed on the relative size of divestitures (hypothesis 5), the remaining hypotheses are designed to explore the relation between (accounting) profitability and abnormal returns on the one hand, and focus effects on the other. This cluster of hypotheses (hypotheses 6 through 13A) rests on an underlying assumption of efficient redeployment. Ultimately, conclusions are formed on the basis of whichever cluster(s) receive majority empirical support. Finally, to lend perspective to the test results, models of the determinants of divestiture announcement abnormal returns, focus changes and the payout/reinvest choice are indicated.

CHAPTER SIX

SAMPLE, DATA AND MEASURES

6.1   INTRODUCTION

This Chapter deals with the construction of the sample, particularly the selection of divestiture transactions. Several filters are applied to maximise the likelihood of a successful test of the efficiency *versus* financing rationales. Relatively small divestitures are admitted to the sample expressly for this purpose. The distribution of abnormal or excess returns across the sample is described in order to establish that results in succeeding Chapters are not driven by a handful of outliers.

Data sources are also described. The considerations in selecting appropriate announcement periods, or event windows, for analysis are reviewed. Finally, measures of several variables are determined, most notably managerial efficiency and focus changes.

6.2   SAMPLE DESIGN

In order to discriminate the financing and efficiency explanations, a matched-pairs sample design is employed, where sellers and buyers of the same divested asset are

matched. This permits analysis of the payout/reinvest choice when the efficiency of the buyer relative to the seller is known.

Relative divestiture size is an important consideration in the sample design. Most event studies sample divestitures that are large relative to the size of the seller, which increases the propensity for signalling information unrelated to the divestment itself. Hite, Owers and Rogers (1987) and Jain (1985) select completed asset sales with sale prices above $10m; the former authors report mean and median relative size figures of 16.4 per cent and 8.2 per cent, respectively. Rosenfeld (1984) selects divestitures exceeding 10 per cent of the market value of the seller's equity prior to the sale, while Afshar, Taffler and Sudarsanam (1992) report relative size percentages of 10.0 and 4.4, for the mean and median respectively. Despite applying a low size filter of a $1m sale price, LPS report mean and median percentages of 69.0 and 23.0, respectively, for their whole sample, and 132.0 and 42.0 for their payout sub-sample. JO select large asset sales in excess of a $100m sale price, and report mean and median relative size percentages of 39.4 and 15.3, respectively, but do not report the figures by the payout/reinvest choice. Klein (1986) and Zaima and Hearth (1985) appear not to prescribe a lower bound, but these almost certainly are dominated by large transactions because the data were obtained from database services which filter out small transactions (for examples, asset sales below $10m).

LPS analyse larger asset sales than other researchers. The relative size of divestments included in their payout sub-sample is also much higher than the mean

and median percentages of 19.8 and 8.3, respectively, reported by Brown, James and Mooradian (1994) for distressed firms paying out their sale proceeds. Thus, the positive market response to large payouts could be driven by factors associated with the size of the divestiture as much as the payout choice: for example, large payouts may signal poor prospects for the firm.

Although neither efficiency nor financing explanations posit a size effect for divestitures, it is essential to include a large portion of divestitures that are small relative to the prior equity value of the seller in order to minimise the signalling of firm-wide liquidity problems that may have prejudiced LPS' (1995) study. LPS (p. 22) recognise that large divestitures relative to the seller's equity value possibly signal firm prospects or the value of remaining assets at the same time as the information about the divestiture itself, and go on to suggest testing their predictions on small divestitures to quarantine the possibility that large asset sales also signal the overall financial condition of the firm.

A further complication is that Alexander, Benson and Kampmeyer (1984) and Hearth and Zaima (1984) report an absence of significantly positive abnormal returns on announcements of divestitures that are small relative to the equity value of the seller prior to the divestiture[1]. An absence of a positive stock market

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[1] Alexander, Benson and Kampmeyer (1984) apply no lower size limit, but did not report the relative sizes of their transactions. However, their observations were obtained from the *Wall Street Journal*, so are more likely to include small asset sales. Hearth and Zaima (1984) also collected a sub-sample of 32 small divestitures, being those with a sale price to book value of seller's assets of less than 8 per cent.

response to relatively small divestitures could possibly be anomalous in that firms appear to be selling assets at no benefit to shareholders, but a more likely explanation is simply that the divestitures are too small in relative terms to have any noticeable impact on abnormal returns.

Since the sample for the present study was collected from source documentation and not commercial databases, the matched-pairs sample comprises a sizeable proportion of relatively small divestitures, though by no means exclusively so. This permits a stronger test of the financing explanation than a sample dominated by relatively large divestitures. In other words, the tests are biased toward rejecting the financing hypothesis. Comparisons with divestiture sizes reported by other studies are reported in the next section.

As indicated in the previous Chapter, several filters are applied in order to maximise the likelihood of successful discrimination between the competing efficiency and financing explanations. A further set of filters is applied to ease measurement problems.

6.3   SELECTION OF DIVESTITURES

The 120 largest listed companies by market capitalisation in July of each calendar year from 1987 to 1993 inclusive were sampled randomly. Random selection

enhances the generalisation of test results from the sample to the population of divestitures. Companies listed on the mining board were not excluded. The largest companies were sampled because their stocks have the least likelihood of being thinly-traded, which imparts a downward bias on estimated betas, which are used in estimating abnormal equity returns[2]. While selection of large sellers increases the likelihood of sampling large divestitures, large selling firms (it turns out) tend to have large numbers of small divestitures as well, such that one large selling firm could have as many divestitures of a similar size to those of several smaller sellers.

Several filters were applied. The first group represents exclusions of industry or company classes for all years. First, banks, trusts and funds (but not insurers) were discarded for all years. Banks are often involuntary acquirers of assets pursuant to default or bankruptcy by their borrowers. These business units nearly always comprise activities unrelated to banking and finance activities, and are usually placed on the market irrespective of the performance of the business unit concerned. A second general exclusion was for foreign companies listed on the ASX but with Australian operations that were insignificant relative to their offshore activities. Here, divestitures could have been triggered by Australian business and regulatory conditions relative to those of the country of origin.

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[2] A useful discussion of this statistical problem is discussed is provided in Bishop, Crapp, Faff and Twite (1993, pp. 185-188).

The second group of exclusions of selling companies was applied on a year-to-year basis. First, a company was excluded if the interest coverage ratio was less than unity in either the year of or preceding divestiture, and second, if a company was not continuously listed (apart from brief trading suspensions) on the ASX for at least one year before and two years after the divestiture date. The second filter was necessary to have sufficient observations to generate abnormal returns. The interest coverage filter requires justification.

The market response predictions for distressed firms paying out/reinvesting their sale proceeds (see Brown, James and Mooradian (1994)) are the reverse of those for non-distressed firms (see LPS). Assuming the degree of financial distress is already known in an efficient capital market, asset sales by firms closer to distress are more likely to signal a deterioration in their financial condition, which may dominate the good news of finding a buyer on agreeable terms. Although LPS exclude firms actually in distress, they admit (p. 12) their sample included firms that defaulted in the years immediately before and after the sample period, so some of these firms (and possibly others as well) must have been experiencing liquidity problems during the sample period[3]. Given that none of the divestiture-related event studies (including JO) patently controls for degrees of distress short of default or bankruptcy, a similar approach is adopted here in order to maintain comparability with LPS. Nevertheless, to minimise the chance of observing distress sales, while

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[3] Distress measures vary, but common benchmarks are interest coverage and (short-term) debt overhang. Interest coverage below unity certainly suggests distress, as does any overhang because net cash flow is inadequate to repay due liabilities.

not excluding asset sales by firms approaching or leaving financial distress, asset

sales by firms with interest coverage ratios below unity (if only for one year) are

excluded[4].

Finally, three classes of deletion were made on an asset-specific basis, comprising (a)

divestitures of interests in mining or oil & gas exploration activities *via* adjustments

to joint venture arrangements, (b) sales of non-going concern assets which have no

income stream (such as unimproved land), and (c) the first divestiture in a series of

programme sales. Programme sales comprise a series of sales announced in

advance, often for the purpose of restructuring, including paying down debt from the

sale proceeds. This exclusion is necessary because the first sale in a series is

especially likely to signal an increased probability of firm-wide financial distress,

whereas subsequent sales are more likely to be evaluated by the capital market on

the terms of sale and the use of the proceeds. All programme sales were excluded

by LPS, but not by JO, presumably because all sales in a programme potentially have

a focus impact. However, since it is desirable to test relatedness arguments on the

same sample as that used to discriminate efficiency and financing explanations,

exclusion of the first of a series of programme sales is not expected to have any

systematic effect on observed focus changes. In any event, initial programme

divestitures are often not the largest in the series. Transfer of control was not

applied as a filter because (a) use of proceeds and focus effects are present even for

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[4] An interest coverage value below unity implies that current-period earnings are insufficient to meet interest obligations, let alone any repayment of principal due.

small transactions, and because (b) small transactions have a lower propensity to signal the seller's overall financial condition, so are a preferred vehicle for testing financing *versus* efficiency explanations, as recommended by LPS (p. 22).

A comprehensive hand-search of divestitures and acquisitions by listed companies in the late 1980s and early 1990s yielded a total of 755 divestitures and 1474 acquisitions, from which 259 divestitures with matched buyers were obtained. Two further requirements were then added before these divestitures could be accepted into the sample:

(1)   joint disclosure by seller and buyer of the profit contributions of a divested asset for up to three years before and after the divestiture date; and

(2)   economic significance.

In relation to (1), a three-year period is considered sufficient to reveal the return potential of an asset. Three years corresponds to the period for which JO track the operating performance (measured by industry-adjusted ROAs) of selling firms' remaining assets following divestiture. A longer period invites the risk that the underlying activities may change as a result of capital expenditure or deletion of unprofitable lines. Although the sampled firms were not randomly selected, there is no a priori reason for believing that the sampled transactions are unrepresentative of the population of divestitures. In relation to requirement (2), economic significance was assumed always present whenever a divestiture involved any portion of the outstanding ordinary stock of a subsidiary or associate company (that is, controlled

entities). Portfolio transactions less than one tenth of one per cent of the seller's equity value prior to the transaction were excluded.

In Australia, the identity of the buyer is not required disclosure, and is uncommon for all except the largest divestitures which attract coverage in the financial press. Buyers were identified from articles in the financial press (mainly *The Australian Financial Review*) in about a third of cases. Requirement (1) resulted in 93 deletions, with another 24 caused by requirement (2). These exclusions brought the final sample size to 142 matched divestitures, for all but two of which announcement dates could be obtained.

For tests involving estimation of abnormal equity returns, the two cases without announcement dates were deleted, but further culling was also necessary. When two or more divestitures were announced on the same date, transactions with compatible payout and focus effects were aggregated, while in the case of dissimilar transactions only the larger transaction was admitted provided that it was more than twice the size of all other divestitures on the same date. Divestitures with announcement dates within five trading days on either side of an acquisition or other divestitures by the same seller were also excluded[5], as were some transactions where the seller's equity was insufficiently traded to generate reliable daily returns.

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[5] A period of five days was selected because the largest price adjustments around acquisition and divestiture announcements typically occur within a week of the announcement.

Sampled stocks were examined for evidence of thin trading, specifically an absence of a daily trade. An entire case was deleted if a trade did not occur on both the day before and the day of a divestiture announcement. Otherwise, if no trade occurred on a given trading day the last price of the previous day was used, consistent with the reporting practice of Statex. No trades for two or more consecutive days resulted in deletion of the case. Unsatisfied bids or asks on zero-volume days were therefore not used.

After making a further 55 deletions for these reasons, the sample for testing arguments involving abnormal returns was culled from 142 to 85. Many sellers are represented several times, with 50 sellers generating the 85 asset sales to 73 buyers. Over 60 per cent of sellers had 30 June fiscal year-ends. Of the 85 matched divestitures, 16 are non-initiating programme sales, and 44 were made by sellers with an interest coverage above one but below two in the fiscal year prior to the divestiture. Exactly half of the 44 asset sales were accompanied by payout. Thus, of the 36 payout divestitures included in the sample of 85 asset sales with announcement dates, 22 were by sellers that could have been subject to a degree of financial distress, and 14 were by sellers presumably not in distress. The steps in deriving the sample are outlined in Table 6.1

The matched seller-buyer transactions are listed in Appendix 1. The year distribution of the full sample and that with announcement dates is shown in Table 6.2. Some evidence of cross-sectional dependency exists, with higher divestiture

Table 6.1

Derivation of the sample of divestitures with matched seller and buyer.

Number of matched divestitures obtained from search		259
less divestitures without disclosure of profit contributions by both seller and buyer	93	
less divestitures not involving control	24	117
Full sample		142
less divestitures with missing announcement dates	2	
less divestitures with confounding announcement dates or insufficient trades of seller's equity	55	57
Sample for testing abnormal return arguments		85

volumes evident in the two years following the October, 1987 stockmarket crash,

and also in 1993 following the two recession years (in Australia) of 1991 and 1992.

This pattern is consistent with both the efficiency and financing rationales. At first

sight, an efficiency explanation does not predict cycles: assets are sold whenever the

bid price is above present value, and in an informationally-efficient market this

argument is independent of inflationary expectations. However, recessions induce

inefficiency in the sense that some existing activities are no longer profitable and

have a poor prognosis, so divestitures into more efficient uses are expected. On the

other hand, financing divestitures are more likely to follow recessionary years

Table 6.2

Distribution of asset sales across fiscal years for the full sample of 142 matched seller-buyer asset sales and the sub-sample of 85 asset sales with announcement dates

	Fiscal year						
	1987	1988	1989	1990	1991	1992	1993
Full sample (*n*=142)	16	35	26	12	5	2	46
Sample with announcement dates (*n*=85)	14	22	20	11	5	2	11

because firms characterised by agency problems should be more vulnerable to economic downturns.

6.3.1 RELATIVE SIZE OF SAMPLED DIVESTITURES

The sample of 85 matched pairs compares favourably with the sample sizes employed in those studies exploring joint seller-buyer wealth effects. Hite, Owers and Rogers' (1987) sample comprised 55 sellers and 51 buyers (covering 1963 to 1978), with no size filter applied. The median asset sale was more than 8 per cent of the seller's equity value prior to the divestiture announcement. Rosenfeld (1984) used a sample of 30 sellers and buyers, but filtered out divestitures with sale prices below 10 per cent of the value of equity of the *acquiring* firm at the announcement date. Sicherman and Pettway (1992) constructed the largest sample, comprising 278

sell-offs reported from 1981 to 1987 with matched sellers and buyers. These transactions were comparatively large, with the mean asset sale accounting for over 30 per cent of the equity value of the seller just prior to the announcement. Finally, Zaima and Hearth (1985) used a sample of 79 divesting and 75 acquiring firms, covering divestitures made from 1975 to 1982, and did not apply a size filter.

The size of divestitures sampled in the present study relative to the size of the seller is compared with that of the samples of LPS and JO in Table 6.3. For the sample of 85 matched-pair divestitures with announcement dates, it can be seen that relative size is comparable with that of JO, but much smaller than that of LPS, for both payout and reinvest sub-samples, particularly in the median values. The empirical propensity for small divestitures to attract negative abnormal returns on announcement is not a problem because it is this very group which is hypothesised most likely to offer support for the financing rationale, that is, to reveal the presence of agency problems.

6.4   SALE DATA

All observed, voluntary sell-offs (and acquisitions) of companies and businesses for cash or securities were taken. Divestments into management or leveraged buyouts are excluded[6], as are spin-offs, asset sales to associated companies[7], asset sales

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[6] The reason is that asset sales could be made to fund part of the buy-out of equity, so the payout/reinvest choice has a different interpretation.

Table 6.3

Comparative relative size of divestitures, measured by the percentage of sale price to the market value of equity prior to a divestiture, for the present study and those of LPS and JO.

	Number of sellers	Number of divestitures	Relative size of divestiture	
			Mean	Median
Present study				
(A) Full sample of matched-pair divestitures	50	142	18.04	1.45
(B) Matched-pair divestitures with announcement dates	50	85	29.78	3.86
payout sub-sample	23	36	50.67	10.59
reinvest sub-sample	35	49	14.44	2.63
Divestitures < 5% of seller's equity value prior to sale	31	48	1.25	0.63
Divestitures ≥ 5% of seller's equity value prior to sale	31	37	66.80	20.04
Divestitures ≥ 10% of seller's equity value prior to sale	26	28	80.59	27.27
LPS				
Whole sample	78	93	69.0	23.0
Payout sub-sample	35	40	132.0	18.0
Reinvest sub-sample	43	53	42.0	13.0
JO				
Sub-sample of listed sellers	*	261	39.4	15.3
Payout sub-sample	*	59	*	*
Reinvest sub-sample	*	202	*	*

* denotes value not reported. Note that sums of sales or sellers across payout/reinvest or relative size divisions do not add to 50 and 85, respectively, because some sellers and sales occur in each group.

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7 During the sample period, associate companies were effectively defined by ASRB 1016, *Commentary*, cl. *v-vi*, as companies in which the parent company held between 20 and 50 per cent of the ordinary shares. Some entrepreneurial companies were believed to dispose of assets to associate companies at higher than market prices in order to inflate the profits of the parent company.

pursuant to full liquidations and disposals forced by regulatory authorities[8].

However, transactions for less than 100 per cent equity ownership are included, as

are equity disposals to takeover bidders. Although no lower bound to this

percentage is set, this is effectively determined by non-disclosures of immaterial

transactions.

In Australia, disclosure of the sale price (or consideration) together with fair value in

company annual reports have been mandated by the accounting standard ASRB

1013 since 19 June, 1988, subject to the materiality provisions of AAS 5. Both

amounts are commonly reported to the ASX within a day or so of an asset disposal

when section 3A(4) notices of the *Official Listing Requirements* are lodged.

Strictly, the disclosures need only be made for material divestitures, but in practice

many immaterial amounts (especially zero consideration) are reported[9]. Disclosure

of the book value (or carrying amount) of subsidiary and associate company

investments and the contribution of these entities to group profit is mandated by the

Corporations Law[10]. This institutional disclosure requirement is unique to Australia

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[8] During the sample period, the few forced divestitures were ordained pursuant to the *Restrictive Trade Practices Act* and the *Radio and Television Broadcasting Act*.

[9] *The Official Listing Requirements* impose a higher materiality threshold than the accounting standards. Section 3A(4)(a) of the former prescribes two complementary materiality tests, one based on assets and the other based on earnings. Materiality in relation to assets is defined as an amount in excess of 10 per cent of the written down value of the listed company's consolidated fixed assets and investments (para. (I)). On the other hand, materiality in AAS 5 (discussion paras. 11, 12) applies a 10 per cent criterion in relation to balance sheet totals or average operating income, with provision for widening to a 5 per cent level.

[10] See the former *Companies Code* (Schedule 7, para. 10(1), and the present *Corporations Law* (Schedule 5, para. 38(2), (3)) which superseded the *Companies Code*.

relative to the U.S., U.K., Japan, Canada and New Zealand. However, this disclosure is often made only with respect to major subsidiaries, so this information is not available for many asset sales, especially those which technically are immaterial. Data for large transactions described in the financial press are occasionally not disclosed in either section 3A(4) notices or the company annual report, principally for sales of equity investments in large companies below a control threshold. This latter group is a potential threat for inferential purposes to the extent that non-disclosure of material transactions is systematically related to the motives or circumstances of divestiture.

Since financial data on acquisitions and divestitures in Australia are not conveniently summarised in any one source, three data sources were used[11]:

(1)   company annual reports;

(2)   ASX lodgements and notices, as summarised in the ASX Company
        Information Service; and

(3)   *The Australian Financial Review.*

All firm financial data were taken directly from company annual reports. Statements of principal activities of divested entities were obtained from the same source. Monthly counts of the number of outstanding ordinary shares were taken from *Personal Investment* prior to March, 1989, and from *The Australian Stock*

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[11] All three sources were hand-searched, since no electronic databases were available.

Exchange Journal, thereafter[12]. The market value of outstanding equity was calculated by multiplying the number of shares so obtained by the last price for the month preceding divestiture. The last price was obtained from the same source as the number of outstanding shares.

Sale prices and profit contributions were often not disclosed. Although this is expected for transactions deemed immaterial for accounting purposes, there was circumstantial evidence of non-disclosure with respect to larger transactions. This is a problem for inference only if such non-disclosure is systematically related to any of the factors identified in this study. Since this cannot be guaranteed, the results presented in this study are necessarily subject to the disclosure policies of the sampled firms. Where the sale price was not disclosed by either the seller or the buyer, some data recovery was possible through use of surrogates, if available. The first was the "fair" value (set at the transaction date), and failing this the book value at the first balance date following acquisition was substituted. About ten per cent of sale prices were estimated in this way.

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[12] Minor classes of stock, such as preference and employee shares, as well as unexercised options, were ignored. This is consistent with common practice.

6.5   ABNORMAL RETURNS AND EVENT WINDOWS

Abnormal or net-of-market equity returns of selling firms for selected windows around announcement are calculated by subtracting the expected return from the observed (or raw) return. Expected returns are determined by applying the standard Sharpe-Linter CAPM, and observed returns are computed from daily price data supplied by the Statex data service of the ASX. The observed returns were adjusted by the author for dividend payments and capitalisation changes (including rights issues, bonus share issues and share splits) because all these transactions reduce the observed price of a share (overnight) from the last *cum* day to the first *ex* day. Observed prices were not adjusted for private placements of equity, employee share issues and exercise of options issued to executives because these are typically smaller in volume and spread throughout the fiscal year. There is no reason to believe this omission adds anything other than noise to the data.

The announcement date is the date of the first public disclosure of a contracted or agreed asset sale, and in event chronology is specified as day 0. Nearly all announcements are made by sellers, but in a few cases announcements appear to have been made by buyers. About two-thirds of these announcements, and nearly all those for large divestitures, were formally advised to the ASX, so the time of announcement was available. When this time was after close of trading at 4 p.m.(as many were), the next day was nominated as the day 0. Abnormal returns were

initially computed for several announcement periods, comprising the windows [-19, 0], [-4, 0], [-1, 0], [1, 5] and [-4, 5], inclusive of the first and last days.

The computational procedure for measuring daily (and cumulative) abnormal returns is set out in Appendix 2. Stock prices adjusted for capitalisation changes are measured at the close of trading on the day before the first day, and at the close of trading on the last day for a given window. Hence, [-1, 0] denotes a two-day event window, while [-4, 5], for instance, denotes a ten-day window. These two windows are nearly the same as those employed by LPS (who use [-1, 0] and [-5, 5] announcement periods), and are referred to as the short and long windows, respectively.

The lead periods [-19, 0] and [-4, 0] are of interest mainly because an intention to sell presumably becomes known during (or before) this period. Boot (1992) conjectures that an intention to sell is essentially bad news, so more negative returns than those on announcement would be expected. The [-4, 0] period might also capture the first public announcement in the event that the transaction became public knowledge a day or so before the advice to the ASX. The longer announcement window commences at day -4 instead of day -5 to reduce the chance that negative abnormal returns reflect an intention to sell a short time before the announcement itself. The five-day [1, 5] portion of the long window captures any *post-announcement* drift. Although the Australian stock market is broadly public

information-efficient[13], *post*-announcement drift is not uncommon[14], and may be a problem for divestiture announcements which require successful completion of negotiations with a buyer and may therefore not be as fully anticipated as firm-specific announcements like earnings and dividend announcements. There is also a likelihood that agreements are announced before details are worked out, and these emerge in the days following the initial announcement. The ten-day [-4, 5] window should therefore capture the full extent of any equity wealth effects around a divestiture announcement.

To ensure the results are not driven by a few outliers, the sample distributions for the [-1, 0] and [-4, 5] windows are plotted in Figures 6.1 and 6.2, respectively. Both distributions can at once be seen to be remarkably symmetrical, but this is not requisite because the proportions of positive and negative abnormal returns are contingent on the nature of the observations selected. For example, a majority of negative abnormal returns could follow from there being a high proportion of reinvest firms. A test for normalcy or skewness is therefore not appropriate. Just one extreme return is obvious

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[13] The evidence is reviewed in Ball, Brown, Finn and Officer (1989).

[14] Examples are continued negative drift after earnings and dividend fall announcements (see Brown, Finn and Hancock (1977) who use daily returns), and after takeover announcements by single bidders (see Bishop, Dodd and Officer (1987) who use monthly returns).

Figure 6.1: Distribution of (-1,0) abnormal returns for matched seller-buyer sample of 85 firms
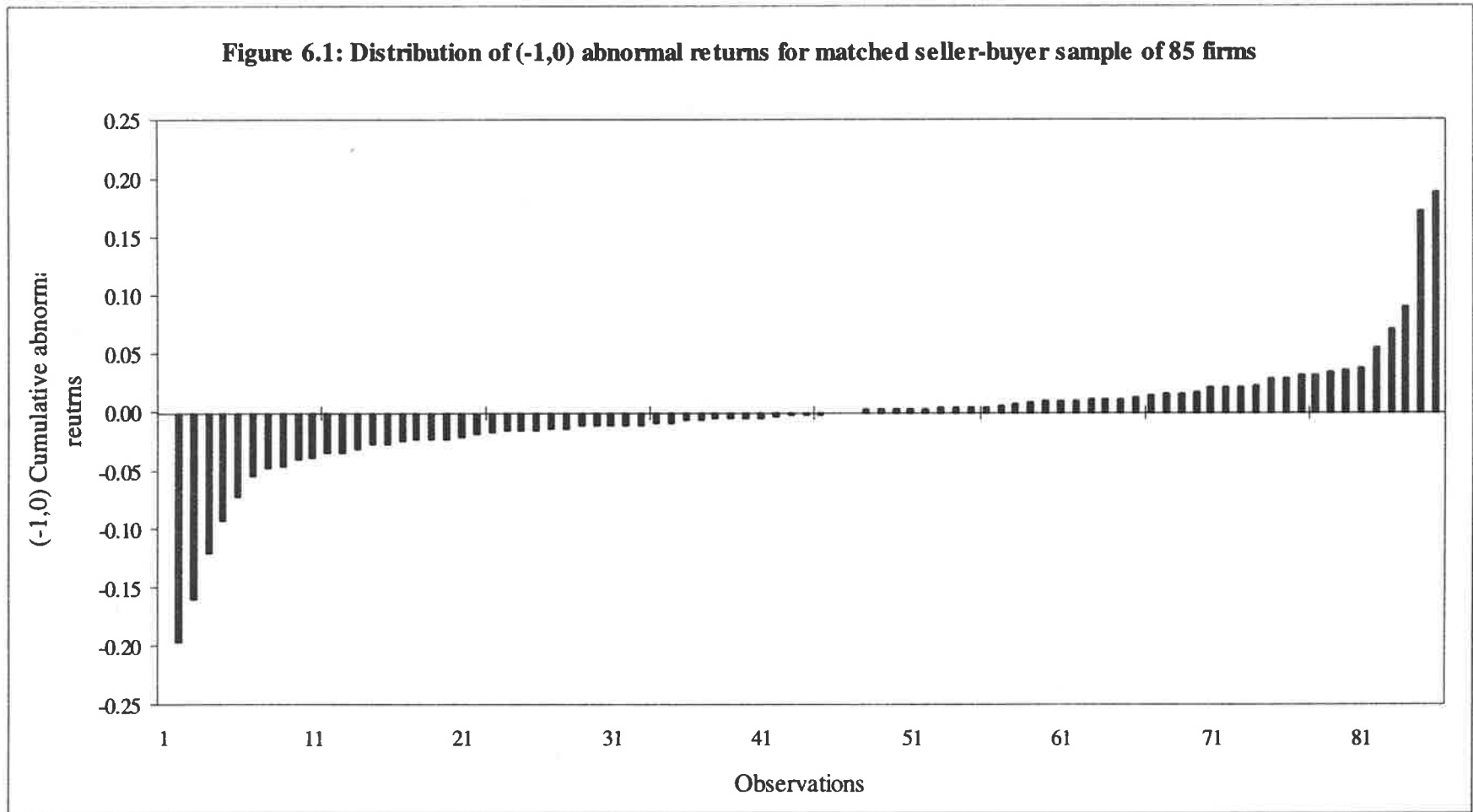
Figure 6.2: Distribution of (-4,5) abnormal returns for matched seller-buyer sample of 85 firms
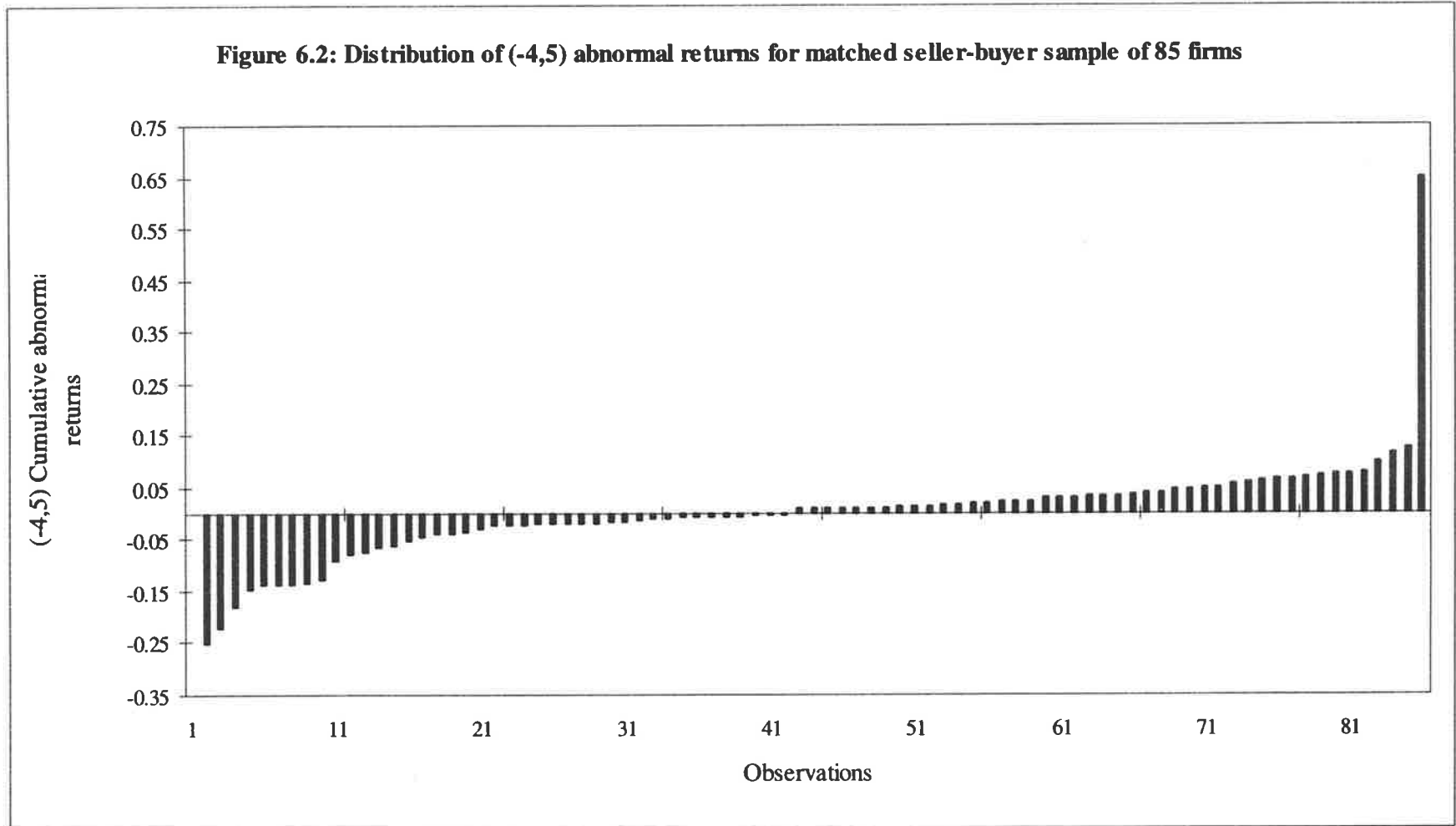
in Figure 6.1. Since upon careful examination this case (Quest International) was found to be valid, the observation was retained rather than be "winsorised" out of the sample (of 85).

6.6   MEASURES OF OTHER VARIABLES

6.6.1   MANAGERIAL EFFICIENCY

The notion of efficiency embraces both operating and managerial efficiency. Operating efficiency implies a sufficient risk-adjusted return from operations, before financing charges and taxation are taken into account. The sufficiency of returns from a given operation is determined by the excess of operating returns in relation to the asset's beta value (which measures covariance risk), but this cannot be measured directly[15]. Managerial efficiency is a wider concept, which subsumes not only operating efficiency but also embraces optimisation of financing and agency costs, and possibly income taxation expense as well[16]. Assuming diminishing marginal

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[15] Asset betas are considered in Brearley and Myers (1991, pp. 199-200).

[16] A full system of company tax imputation was introduced to Australia from 1 July, 1987. A major impact of this system is to place a ceiling on the sum of company and personal income tax payable by resident individual shareholders in relation to company taxable income. Hence, minimisation of company tax is questionable as an objective because total income tax paid by at least one shareholder clientele should be unaffected. However, enough exceptions exist to cause minimisation of company tax to have some potency as a corporate aim. See Bishop, Crapp, Faff and Twite (1993, ch. 16).

effectiveness of bonding and monitoring, agency costs cannot be entirely eliminated. As a result, some financing costs (or the costs of financial distress) also remain to the extent that debt claims are risky and debtholders cannot rely on managers to act as their agents.

At firm level, efficiency in the broader sense should be captured by a seller's net-of-market return. In the present study, two periods are used. One is over the year prior to divestiture, represented by the window $[-250, -5]$[17]; the other is around the divestiture announcement, where the market response is used to infer the degree of managerial efficiency. The net-of-market return also reflects the market's anticipation of the wealth impact of future events, but this in turn depends partly on the extant capacity of incumbent managers to respond to investment and financing opportunities. This market-based measure is preferred to alternative accounting measures, such as return on assets or return on equity, that not only measure current-period cash flow imprecisely, but also fail to imply a benchmark return[18].

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[17] For this purpose, the equity betas provided by the *Risk Measurement Service* of the Australian Graduate School of Management were used. These are estimated on monthly returns over a period of up to 48 months.

[18] A common measure of firm-wide operating returns is return on assets (ROA), which is earnings after abnormals but before interest and tax (EBIT) divided by the mean book value of total assets for the fiscal period. Alternative measures are possible. For example, JO (p. 112) also relate EBIT to sales (the operating margin), and to the market value of equity plus the book value of debt (which is preferred by Healy, Palepu and Ruback (1992)). They also measure EBIT before depreciation to obtain a rough approximation of operating cash flow. Firm-wide managerial efficiency is proxied by return on equity (ROE), which is earnings after interest, tax and extraordinaries, divided by mean net assets or the market value of equity. Corresponding industry averages must be used for benchmarking, but only ROA figures are available from the *Comparative Ratio Analysis*. Following JO, a positive (negative) difference when the (main) industry ROA is subtracted from the firm's ROA indicates firm efficiency (inefficiency).

In relation to divested assets, efficiency is proxied by profit contributions *pre-* and *post-*divestiture. Profit contributions (hereafter, PRCs) are measured after interest and tax, and usually after extraordinary items. Hence, PRCs measure the degree of managerial efficiency rather than operating efficiency, and the number is not smoothed through measuring income before extraordinaries. Depreciation (and amortisation) is not added back to obtain a net cash flow measure because acquirers are likely to make initial capital outlays and, given only three years' observations, accounting income numbers over a short time span should be a more reliable guide to efficiency than unadjusted cash flow estimates. Further, and notwithstanding that accounting income numbers may be poor proxies for net cash flow, there is no reason to expect any systematic relation between accounting accrual choices and payout/reinvest decisions. Thus, in general, higher PRCs following divestiture than before suggest improved managerial efficiency.

PRCs for three consecutive years, both *pre-* and *post-*divestiture, are collected. Three adjustments are made. The first is for very small portions of a year for which an asset was operated before disposal. When in the last year of ownership by a seller an asset was operated for less than 60 days, the preceding year's PRC was substituted for the final year. This adjustment affected eight observations, and had the effect of removing zeros or non-disclosures which otherwise would have been taken for the last year of operation. Otherwise, finer adjustments for operating period differences between sellers in the last year and buyers in the first year were not attempted, the main reason being that the PRC of buyers in the first year is

presumably affected by establishment and change-over costs which are not a function of time. These costs are relevant because they still have to be recovered before the buyer can earn a sufficient return. A three-year period either side of a divestiture is considered long enough to indicate the ability of a buyer to alter the return from a divested asset.

The second adjustment to the PRCs is for unequal ownership interests between sellers and buyers, attributable either to disposals of part ownership interests or to sales to multiple buyers. For partial asset sales, the seller has a higher equity ownership percentage than the buyer. Where there are two buyers of the same divested asset, the seller's profit contributions are divided according to equity ownership between the two buyers, creating two divestitures (and having the same announcement date). For the purpose of calculating a return, PRC can be divided by either the sale price or the book value of the divested asset, but the latter is prone to accounting valuation assumptions and datedness, while the former is subject to the overpayment factor. A sufficient condition for efficiency gains to result from divestiture is that a divested asset generates higher net cash flows (proxied by PRCs) in combination with the buyer's assets than the seller's. Importantly, there is no need to control for risk differences between sellers' and buyers' uses of divested assets because more efficient use does not imply constant risk. In other words, transfers into more or less risky uses may be a necessary consequence of improved efficiency.

To give an idea of the extent of industry changes associated with divestitures, the

ASX industry codes of sellers, their buyers and the divested asset are compared in

Table 6.4 for the matched seller-buyer sample with divestiture announcement dates.

The raw count for the possible three-way equality/inequality combinations is given in

column (1). However, this count is misleading because three of the ASX industry

classifications are non-specific: miscellaneous services (#21), miscellaneous

Table 6.4

Comparative ASX industry classifications of sellers, their buyers and the divested asset for a matched seller-buyer sample of 85 asset sales.

	(1) Number of cases	(2) Number of cases after excluding divestitures involving a non-specific ASX industry classification
1. ASX industry of seller, buyer and divested asset the same	14	12
2. ASX industry of seller and buyer the same, but not the divested asset's	2	1
3. ASX industry of seller and divested asset the same, but not the buyer's	11	4
4. ASX industry of buyer and divested asset the same, but not the seller's	31	24
5. ASX industry of seller, buyer and the divested asset all different	27	6
Total	85	47

industrials (#22), and diversified industrials (#23)[19]. Once divestitures involving one or more of these industries are excluded, the distribution in column (2) is obtained, which shows the highest loadings on the first and fourth combinations. The former is expected when an inefficient seller sells to a competitor, while the latter is consistent with the precepts of corporate strategy.

The final adjustment is for inflation. The PRC series for each seller and buyer is adjusted by a Gross Domestic Product deflator corresponding to the calendar year to which the PRC mainly relates[20]. Given the preceding adjustments, buyers' efficiency is inferred to exceed (is lower than) sellers' efficiency when the mean of the *post*-divestiture adjusted PRCs exceeds (is less than) the mean of the *pre*-divestiture adjusted PRCs. The expectation is that abnormal returns on a divestiture announcement are positive (negative) when *post*-divestiture adjusted PRCs are higher (less) than *pre*-divestiture adjusted PRCs. For brevity, the adjective "adjusted" is omitted in most succeeding references to PRCs.

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[19] Until 1992, the ASX industry codes were two-digit.

[20] Results for fiscal years ending on 30 June were apportioned equally between adjacent years. This adjustment made very little difference to the test results reported later compared with no adjustment.

6.6.2 FOCUS AND FOCUS CHANGES

Focus implies a (i) small number of (ii) related activities, or lines of business. The first condition is problematic: it is difficult to determine on *a priori* grounds the number of activities that a firm should optimally have. The second condition is more tractable. Given an array of related and unrelated activities exists, sales of related assets are focus-decreasing, while sales of unrelated assets are focus-increasing.

JO (pp. 110-112) employ three measures of focus. The first focus measure is the number of lines of business reported by the seller. In Australia, financial disclosures are made only for segments, which are broader than lines of business or activities, so this measure is discarded because it is too coarse. The second measure is a revenue-based Herfindahl index, which has been described previously in section 2.6.1. However, this measure is subject to the same shortcoming as the first. The third focus measure is a direct measure of the relatedness of the divested asset or division to the seller's main operations, and is the measure adopted in the present study. The measure is based on that used by Morck, Shleifer and Vishny (1990) for determining related acquisitions. An asset disposal is related (unrelated) if there is a match (no match) at the four-digit level between one of the two main ANZSIC codes of the divested asset and any one of the *four* main ANZSIC codes (by segment revenue) of the seller. The choice of four segments is somewhat arbitrary, but falls between the numbers used in the two studies referred to above[21]. Since focus changes are transaction- and not firm-specific, it is

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[21] JO employ a cut-off of five segments, while Morck, Shleifer and Vishny (1990) use three.

possible for sellers with multiple (and material) asset sales in a given fiscal year to show

both focus-increasing and focus-decreasing divestitures (in common with the selection

process of JO). This is not a problem because the dominance of one divestiture's focus

effect over another divestiture's opposite focus effect in the same fiscal year is an

empirical matter. The coincidence of divestitures with opposite focus impacts in the

same fiscal year is diminished as materiality filters are applied.

6.6.3 MEASURES OF REMAINING VARIABLES[22]

The relative size of a divestiture is the ratio of the asset sale proceeds to the

beginning-of-period book value of the firm's total assets. A firm's growth

opportunities are measured by the ratio of the market value of outstanding ordinary

shares to the book value of net assets at the beginning of the year of divestiture. A

premium is the norm, if only because the book value of assets is below replacement

cost, where the latter reflects future investment opportunities across the market[23].

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[22] One possible explanatory variable, the proportion of managerial ownership, was not
collected owing to difficulty in interpreting the disclosed shareholdings of directors of listed
companies. These shareholdings are separated in annual report disclosures according to
beneficial and non-beneficial interests. The former classification represents directors' equity
ownership, while the latter is intended to reveal the extent of directors' control over the voting
rights of shares they do not own. Non-beneficial interests are typically holdings by directors in
their capacity as trustees, often for the company's superannuation fund, but also for family
trusts. Except for a few companies characterised by owner-manager control (such as News
Corporation), beneficial holdings are typically very low (less than 5 per cent), while non-
beneficial holdings are higher. Since many directors are believed to shift their direct interests
into the non-beneficial classification by the use of trusts, neither the beneficial interest nor the
aggregate is likely to reveal the degree of managerial ownership.

[23] Revaluation adjustments by accountants partly close this gap.

This ratio does not distinguish the source of growth from existing operations and new investment opportunities (that is, growth options). Tobin's q, which is the ratio of the market value of asset's to their replacement cost[24], is another possible measure, but book values are not a satisfactory surrogate for replacement cost, data for which are not available. The leverage variables are measured on the basis of all liabilities and are not restricted to (interest-bearing) debt because sale proceeds could be used to extinguish or reduce creditor obligations in general. Interest coverage is earnings before interest and tax (EBIT) divided by interest payments for the preceding fiscal year. Liabilities are preferred over debt for short-term and long-term leverage measures because non-interest bearing liabilities may be as important in the payout decision as debt obligations. In general, all accounting-based variables are measured at the end of the fiscal year *preceding* the year of divestiture.

Payout decisions are identified either by direct disclosure when a divestiture is announced, or inferred from a sharp decline in the debt to assets ratio. Otherwise, reinvestment is assumed. Disposition intentions were disclosed for about three-quarters of the observations. For the remainder of the observations, inference of a payout/reinvest intention from subsequent debt levels requires an assumption that investors could have anticipated this when the divestiture was announced. In an efficient capital market this is considered a reasonable assumption, for if a firm is known to be trying to reduce debt levels then a successful asset sale signals a payout intention.

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[24] Tobin's q is discussed in Brealey and Myers (1991, pp. 684-685).

Conversely, if a firm is known not to be retiring debt, then reinvestment is expected. Since payouts reduce the value of assets under managers' control, payouts to debtholders and (the few) payouts to shareholders are not distinguished[25]. In order to classify a firm as a payout or reinvest firm in a given fiscal year, twice as many payouts (reinvestments) by value were required to be observed before a firm was classified as payout (reinvest). For lower inequalities, no payout/reinvest classification was assigned.

6.7   CHAPTER SUMMARY

This Chapter has detailed the construction of the sample, particularly the selection of divestiture transactions. Several filters are applied to maximise the likelihood of a successful test of the efficiency *versus* financing rationales, chief among these being adequate disclosure of buyer and seller profitability with respect to divested assets, and sufficient market trades to generate daily abnormal returns. Unlike most other studies, relatively small divestitures are admitted to the sample.

[-4, 5] and [-1, 0] event windows are focused upon because similar windows were used by LPS. The distribution of abnormal or excess returns for these windows across a sample of 85 observations with complete accounting and market data is found not be influenced by outliers, save for one observation which is retained. Data

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[25] Payouts to shareholders usually took the form of special dividends or return of capital, including share repurchases.

sources are also described. Finally, measures of several variables are determined,

most notably managerial efficiency and focus changes.

CHAPTER SEVEN

DESCRIPTIVE STATISTICS

7.1   INTRODUCTION

Before formally testing the hypotheses, the data are described and empirical

regularities noted. The latter exercise is potentially insightful because not all

expected relationships have been incorporated in hypotheses. Hypothesis 3 is tested

in passing. The matched seller-buyer sample of 85 asset sales with announcement

dates is used to generate all descriptive statistics and to test all hypotheses except

hypotheses 8 to 10, where the full sample of 142 divestitures is used to derive

smaller sub-samples which would otherwise have been too small for establishing

statistical significance. Apart from Rosser (1991), no descriptive studies of

Australian divestitures have been reported. The sample statistics reported here are

not compared because Rosser's sample comprised all divestitures observed in 1987-

1989, primarily for large firms and not employing a matched seller-buyer design.

7.2   SELLER, BUYER AND SALE CHARACTERISTICS

Descriptive statistics for the sample of 85 matched seller-buyer divestitures with

announcement dates are reported in Tables 7.1 and 7.2. The statistics for the full

sample of 142 matched seller-buyer divestitures are much the same, so are not reported separately. Of these 85 matched divestitures, 36 are payouts and 49 are reinvest transactions. Apart from the sale price, all financial data relate to the fiscal year-end prior to the year of sale.

A notable feature of Table 7.1 is that nearly all median values are several times lower than mean values, suggesting log-normal distributions; that is, a small number of relatively large divestitures. Standard two-sample significance tests are applied. These are a t-test on the mean difference between independent samples and a (non-parametric) Wilcoxon signed-rank test[1]. The latter significance test is appropriate when paired differences are not normally distributed, and is also less sensitive to small sample sizes (especially <20) than the t-test[2]. Two-tailed tests of significance are appropriate when there is no expectation on the direction or sign of the difference.

Some significant differences between payout and reinvest sellers emerge. From Table 7.1, payout divestitures are about four times larger than reinvest divestitures; the corresponding inequality reported by LPS (p. 10) is seven fold. However, there are no significant differences in the size of payout and reinvest sellers. From Panel (B) of Table 7.2 it appears that payout sellers have

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[1] Both tests are explained in any standard introductory statistics text. See, for example, Anderson, Harrison, Sweeney, Rickard and Williams (1989), pp. 339-342 and 663-666.

[2] See Siegel (1956, p. 83).

Table 7.1

Size of asset sales and sellers by payout and reinvest sub-samples for a matched seller-buyer sample of 85 asset sales.

Sub-samples:	Whole sample (n=85)	Payout sub-sample (n=36)	Reinvest sub-sample (n=49)	Difference between payout and reinvest sub-samples
	mean median std. dev.	mean median std. dev.	mean median std. dev.	two-tailed p (t-test) two-tailed p (signed-rank test)
Sale price ($m)	116.4 23.8 351.4	187.4 29.8 517.3	64.3 16.0 119.8	.169 .159
Market value of equity ($m)	1446.0 547.4 2271.7	1036.1 520.3 1236.2	1747.2 685.1 2774.6	.116 .344
Sale price/ market value of equity	.298 .039 .780	.507 .106 1.073	.145 .026 .409	.061* .049**
Total assets ($m)	2758.1 1386.4 4057.5	2704.4 1740.3 3292.1	2797.6 896.6 4572.1	.917 .311
Sale price/total assets	.124 .022 .462	.184 .027 .677	.079 .017 .185	.303 .335

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

significantly poorer growth prospects than reinvest firms. Hypothesis 3 may be tested on the performance and leverage differences also reported in Table 7.2. It is evident that payout sellers are significantly more highly levered at the long end, and have an inferior market-to-book ratio, suggesting lower growth prospects. However, the lower interest coverage does not differ significantly from that of reinvest sellers. The accounting-based performance figures of payout and reinvest sellers in Panel (B) provide

Table 7.2

Divestiture and *pre*-divestiture seller characteristics for a matched seller-buyer sample of 85 asset sales.

Sub-samples:	Whole sample (n=85)	Payout sub-sample (n=36)	Reinvest sub-sample (n=49)	Difference between payout and reinvest sub-samples
	mean median std. dev.	mean median std. dev.	mean median std. dev.	two-tailed p (t-test) two-tailed p (signed-rank test)[†]
(A) Leverage characteristics of selling firms				
Interest coverage (EBIT/interest payments)	7.33 1.89 27.26	5.57 1.64 16.58	8.63 2.10 33.11	.612 .141
Short-term liabilities/total assets	.272 .272 .100	.268 .271 .096	.276 .272 .103	.732 .873
Long-term liabilities/total assets	.273 .266 .131	.326 .309 .127	.235 .251 .122	.001*** .003**
Total liabilities/total assets	.545 .541 .143	.594 .577 .160	.510 .523 .119	.007** .001***
(B) Performance characteristics of selling firms				
Net income/market value of equity	.092 .070 .316	.123 .065 .460	.068 .076 .137	.494 .203
EBIT/total assets	.157 .072 .373	.160 .077 .261	.156 .072 .440	.966 .968
Cumulative net-of-market return [-250, -5]	.076 .059 .503	-.013 -.023 .387	.142 .115 .568	(.081)* (.094)*
Market-to-book ratio	1.53 1.24 1.04	1.32 1.06 1.02	1.68 1.55 1.04	.118 .027**

Table 7.2 (continued)

(C) Performance characteristics of divested assets

Mean 3-year *pre-*	.274	.301	.254	.891
divestiture PRC/sale	.018	.034	.017	.803
price[‡]	1.539	1.689	1.437	
Proportion of related	.442	.417	.460	n.a.
divestitures				

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

[†] One-tailed probabilities are shown in parentheses when there is a directional expectation.

[‡] Two cases with zero sale prices have been winsorised to the maximum observed value.

no support for the hypothesis, but the [-250, -5] cumulative net-of-market return is significantly lower for payout than reinvest sellers when a one-tail test is applied, given a difference in the hypothesised direction. Thus, hypothesis 3 receives only partial support. In contrast, LPS report (see their Table 2) that their payout firms have significantly inferior interest coverage, leverage, income and abnormal return characteristics compared with reinvest firms. Given the sample in the present study includes a higher proportion of small divestitures than LPS' sample, this outcome suggests that smaller divestitures may not be made for financing purposes[3]. If so, the generality of the financing argument is weakened: relatively large divestitures combined with payout suggest a financing problem, but these divestitures also have the highest chance of signalling the financial condition of the seller as well as the financing purpose of the divestiture.

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[3] At this point, it is tempting to suggest partitioning the sample into relatively small and large divestitures, but there is no point because the main purpose is to test the generality of LPS' (1995) arguments.

It could possibly be argued that reinvest sellers are more likely to dispose of their poorly-performing units (or "dogs") than payout sellers, who may have to sell their valuable assets to raise finance. Although the observed inequality (see Panel (C)) is consistent with this line of reasoning, the *pre*-divestiture profitability of divested assets does not differ significantly between payout and reinvest sellers. The sufficiency of *pre*-divestiture profitability of divested assets in terms of meeting a risk-adjusted required rate of return is not addressed.

Cumulative abnormal equity returns are reported in Table 7.3 for selected announcement windows. None is significantly different from zero, as indicated by the probabilities obtained on the (unreported) z-statistics. Failure to produce the positive abnormal returns documented extensively in the empirical literature is possibly attributable to the high proportion of small divestitures sampled relative to most other studies, but is consistent with the result obtained in the only other reported Australian study, which sampled only large divestitures[4]. Only one of the payout/reinvest differences is significant: this is for the [1, 5] window, suggesting the presence of *post*-announcement drift. The drop of more than 5 per cent (-.0519) across [-4, 5] just fails to achieve significance at the 10 per cent level.

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[4] See Barker (1988). There is no apparent reason why Australian divestitures should attract smaller abnormal returns on announcement than their overseas counterparts. However, this could be due in part to Barker's selection procedure, which *infers* divestitures from 50 per cent or higher declines in reported financial amounts, such as total assets. This procedure is so crude as to render Barker's results unreliable.

Table 7.3

Cumulative abnormal equity returns of selected announcement windows for a matched seller-buyer sample of 85 asset sales and for payout and reinvest sub-samples.

Announcement window:	[-19, 0]	[-4, 0]	[-1, 0]	[1, 5]	[-4, 5]
(A) Whole sample (n=85)					
Mean	-.0116	-.0002	-.0032	.0056	.0084
Median	-.0247	.0002	-.0019	.0001	.0089
Std.dev.	.1221	.0795	.0493	.0726	.1583
Two-tailed *p* (*z*-statistic)	.353	.925	.487	.429	.626
(B) Payout sub-sample (n=36)					
Mean	-.0295	-.0128	-.0107	-.0079	-.0215
Median	-.0304	-.0182	-.0037	-.0084	-.0078
Std.dev.	.1458	.0707	.0439	.0538	.0778
Two-tailed *p* (*z*-statistic)	.233	.285	.152	.385	.105
(C) Reinvest sub-sample (n=49)					
Mean	.0016	.0090	.0023	.0154	.0304
Median	-.0209	.0057	-.0019	.0060	.0111
Std.dev.	.1008	.0850	.0527	.0829	.1957
Two-tailed *p* (*z*-statistic)	.988	.516	.859	.167	.282
(B)-(C) Payout/reinvest differences					
Mean	-.0311	-.0218	-.0130	-.0233	-.0519
two-tailed *p* (*t*-test)	.248	.215	.230	.144	.136
Median	-.0095	-.0239	-.0018	-.0144	-.0189
Two-tailed *p* (signed-rank test)	.631	.171	.551	.077*	.120

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

Tables 7.4 and 7.5 present similar descriptive statistics for buyers and their acquisitions according to sellers' use of sale proceeds, in the event that buyers or the acquired asset differ systematically according to the payout/reinvest choice. Both

Table 7.4

Size of acquisitions and buyers by payout/reinvest choice of sellers, for a matched seller-buyer sample of 85 asset sales

Sub-samples:	Whole sample (n=85)	Payout sub-sample (n=36)	Reinvest sub-sample (n=49)	Difference between payout and reinvest sub-samples
	mean median std. dev.	mean median std. dev.	mean median std. dev.	two-tailed p (t-test) two-tailed p (signed-rank test)
Value of acquisitions ($m)	116.4 23.8 351.4	187.4 29.8 517.3	64.3 16.0 120.0	.169 .159
Market value of equity ($m)	1725.7 722.8 3017.6	1638.5 642.3 3041.4	1789.7 731.4 3029.9	.821 .618
Value of acquisition/market value of equity	.441 .028 1.777	.676 .034 2.330	.269 .023 1.220	.344 .119
Total assets ($m)	2594.0 1299.4 4366.0	2636.0 1458.1 4578.3	2563.2 1228.0 4251.2	.940 .940
Value of acquisition/total assets	.494 .021 2.932	.811 .029 4.330	.261 .019 1.110	.396 .187

tables are unremarkable, with a complete absence of significant differences with respect to the financial characteristics of buyers. Although no hypothesis is formed, the *post-acquisition* return of divested assets is of interest. Buyers from payout sellers appear to do worse than buyers from reinvest sellers (.024 versus .045), but the differences are not statistically significant.

Table 7.5

Acquisition and buyer characteristics for a matched seller-buyer sample of 85 asset sales and seller payout and reinvest sub-samples

Sub-samples:	Whole sample (n=85)	Payout sub-sample (n=36)	Reinvest sub-sample (n=49)	Difference between payout and reinvest sub-samples
	mean median std. dev.	mean median std. dev.	mean median std. dev.	two-tailed p (t-test) two-tailed p (signed-rank test)
(A) Leverage characteristics of selling firms				
Interest coverage (EBIT/interest payments)	16.19 1.97 63.15	18.22 1.94 69.51	14.69 1.97 58.74	.801 .940
Short-term liabilities/ total assets	.292 .269 .306	.278 .274 .114	.303 .239 .393	.710 .218
Long-term liabilities/ total assets	.284 .254 .436	.241 .245 .134	.315 .261 .563	.446 .975
Total liabilities/total assets	.576 .521 .714	.519 .523 .152	.618 .492 .934	.532 .426
(B) Performance characteristics of selling firms				
Net income/value of equity	.076 .079 .106	.071 .080 .141	.079 .077 .073	.761 .696
EBIT/total assets	.140 .077 .317	.112 .072 .161	.160 .081 .395	.498 .239
Market-to-book ratio	1.485 1.417 .711	1.409 1.387 .553	1.542 1.515 .809	.370 .369

Table 7.5 (continued)

(C) Performance characteristics of divested assets				
Mean 3-year *post*-acquisition profit contribution (PRC)/ acquisition price[†]	.465 .037 2.081	.280 .024 1.694	.600 .045 2.332	.486 .447
Proportion of related acquisitions	.671	.694	.653	n.a.

[†] Two cases with zero sale prices have been winsorised to the maximum observed value.

Table 7.6 reports cumulative abnormal equity returns for buyers, again with a breakdown for payout/reinvest divestitures. Subject to one minor exception, buyers' returns do not differ significantly from zero, which is consistent evidence documented for acquiring firms involved in successful takeover bids and mergers in general[5]. Since significance on abnormal returns is noticeably absent in Tables 7.3 and 7.6 for longer *pre*-divestiture windows, all subsequent analysis is confined to the two-day [-1, 0] and ten-day [-4, 5] announcement periods, which are almost identical to those adopted by LPS.

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5 Only abnormal returns on successful bids are relevant because unsuccessful attempts to divest are excluded from the divestitures sample. For recent Australian evidence from daily returns, see Bugeja and Walter (1995, esp. pp. 40-46), who document that successful bidders on average receive insignificantly negative abnormal returns for a [-60, 1] announcement window. Bugeja and Walter review prior evidence as well.

Table 7.6

Cumulative abnormal equity returns of buyers for selected announcement windows for a
matched seller-buyer sample of 85 asset sales and for seller payout and reinvest sub-
samples.

Announcement period:	[-19, 0]	[-4, 0]	[-1, 0]	[1, 5]	[-4, 5]
(A) Whole sample (n=85)					
Mean	-.0060	-.0022	-.0006	.0081	.0053
Median	-.0036	-.0033	.0006	.0048	.0000
Std.dev.	.0799	.0381	.0337	.0469	.0598
two-tailed p (z-statistic)	.488	.590	.877	.115	.419
(B) Payout sub-sample (n=36)					
Mean	-.0022	.0008	.0028	.0036	.0047
Median	-.0033	-.0071	.0025	.0022	-.0061
Std.dev.	.0777	.0411	.0346	.0481	.0737
two-tailed p (z-statistic)	.868	.905	.630	.655	.702
(C) Reinvest sub-sample (n=49)					
Mean	-.0089	-.0045	-.0030	.0114	.0056
Median	-.0078	-.0007	.0003	.0056	.0025
Std.dev.	.0821	.0360	.0331	.0462	.0479
two-tailed p (z-statistic)	.452	.388	.523	.091*	.413
(B)-(C) Payout/reinvest differences					
Mean	.0067	.0053	.0058	-.0078	-.0009
two-tailed p (t-test)	.704	.529	.432	.454	.949
Median	.0045	-.0064	.0022	-.0034	-.0086
two-tailed p (signed-rank test)	.894	.528	.709	.499	.852

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

7.3 CUMULATIVE ABNORMAL RETURNS OF SELLERS BY SELECTED FINANCIAL CHARACTERISTICS

Reinvestment implies higher growth prospects than for payout sellers because the latter appear not to have debtholder support for retention of sale proceeds. Abnormal returns are reported for payout and reinvest sellers according to their growth prospects (proxied by below- and above-median market-to-book ratios, respectively) in Table 7.7, but statistical significance is not obtained on any of the intersections. Thus, sellers' growth prospects appear to have little market significance irrespective of the disposition of the sale proceeds.

Table 7.8 explores the relation between sellers' (bottom-line) net income in the fiscal year prior to sale and abnormal equity returns. Following LPS (p. 15), a positive/negative dichotomy on net income is employed in order to minimise type 1 error: that is, misclassifying poorly performing sellers as adequately performing. In the absence of risk adjustments, negative returns cannot be adequate, while positive returns may be. No significant differences in abnormal returns are found either between payout and reinvest sellers (unlike LPS (p. 11)), or between negative and positive net income sellers. The former result does not bode well for the financing explanation, while the latter result could be attributable to accounting income numbers lagging economic events.

Table 7.7

Cumulative abnormal equity returns of sellers for below- and above-median market-to-book ratios by payout and reinvest divestitures, for a matched seller-buyer sample of 85 asset sales.

Announcement period:	[-1, 0]		[-4, 5]	
	Mean	Median	Mean	Median
(A) Below-median market-to-book				
Payout firms (*n=24*)	-.0136	-.0014	-.0272	-.0096
two-tailed *p* (*z*-statistic)	.875		.449	
Reinvest firms (*n=19*)	.0095	.0017	.0602	-.0060
two-tailed *p* (*z*-statistic)	.580		.130	
Total (*n=43*)	-.0034	-.0012	.0115	-.0071
two-tailed *p* (*z*-statistic)	.704		.728	
Payout/reinvest differences				
two-tailed *p* (*t*-test)	.200		.188	
two-tailed *p* (signed-rank test)		.942		.434
(B) Above-median market-to-book				
Payout firms (*n=12*)	-.0050	.0059	-.0103	.0115
two-tailed *p* (*z*-statistic)	.133		.861	
Reinvest firms (*n=30*)	-.0030	-.0027	-.0074	.0136
two-tailed *p* (*z*-statistic)	.148		.606	
Total (*n=42*)	-.0036	-.0040	.0053	.0118
two-tailed *p* (*z*-statistic)	.557		.600	
Payout/reinvest differences				
two-tailed *p* (*t*-test)	.888		.329	
two-tailed *p* (signed-rank test)		.540		.303
(A)-(B) Below-/above-median market-to-book differences				
Two-tailed *p* (*t*-test)	.985		.858	
Two-tailed *p* (signed-rank test)		.664		.195

Table 7.8

Cumulative abnormal equity returns of sellers for payout and reinvest divestitures by negative/positive net income, for a matched seller-buyer sample of 85 asset sales.

Announcement period:	[-1, 0]		[-4, 5]	
	Mean	Median	Mean	Median
(A) Negative net income of year prior to sale				
Payout firms (*n=12*)	-.0167	-.0104	-.0522	-.0332
two-tailed *p* (*z*-statistic)	.387		045**	
Reinvest firms (*n=3*)	-.0160	-.0234	.0373	.0653
two-tailed *p* (*z*-statistic)	.630		.536	
Total (*n=15*)	-.0165	-.0150	.0329	-.0193
two-tailed *p* (*z*-statistic)	.415		.731	
Payout/reinvest differences				
two-tailed *p* (*t*-test)	.996		.465	
two-tailed *p* (signed-rank test)		.773		.386
(B) Positive net income of year prior to sale				
Payout firms (*n=24*)	-.0070	-.0014	-.0062	-.0072
two-tailed *p* (*z*-statistic)	.818		.800	
Reinvest firms (*n=46*)	.0030	-.0001	.0080	.0108
two-tailed *p* (*z*-statistic)	.961		.504	
Total (*n=70*)	-.0007	-.0014	.0031	.0100
two-tailed *p* (*z*-statistic)	.888		.664	
Payout/reinvest differences				
two-tailed *p* (*t*-test)	.314		.354	
two-tailed *p* (signed-rank test)		.921		.719
(A)-(B) Negative/positive net income differences				
Two-tailed *p* (*t*-test)	.264		.756	
Two-tailed *p* (signed-rank test)		.167		.062*

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

The descriptive analysis of Table 7.8 is repeated for the [-250, -5] cumulative net-of-market return in Table 7.9. Again, a positive/negative separation is employed. Only one of the differences is significant at the 90 per cent confidence level or better. The payout/reinvest difference for positive net-of-market returns across the longer window is

Table 7.9

Cumulative abnormal equity returns for payout and reinvest sellers by negative/positive cumulative net-of-market returns [-250, -5], for a matched seller-buyer sample of 85 asset sales.

Announcement period:	[-1, 0]		[-4, 5]	
	Mean	Median	Mean	Median
(A) Negative [-250, -5] net-of-market return				
Payout firms (*n=18*)				
two-tailed *p* (*z*-statistic)	-.0105	-.0086	-.0024	.0037
	.807		.956	
Reinvest firms (*n=17*)				
two-tailed *p* (*z*-statistic)	-.0108	-.0052	-.0233	-.0060
	.049**		.246	
Total (*n=35*)				
two-tailed *p* (*z*-statistic)	-.0106	-.0059	-.0125	-.0019
	.300		.342	
Payout/reinvest differences				
two-tailed *p* (*t*-test)	.989		.430	
two-tailed *p* (signed-rank test)		.766		.409
(B) Positive [-250, -5] net-of-market return				
Payout firms (*n=18*)				
two-tailed *p* (*z*-statistic)	-.0110	-.0014	-.0407	-.0206
	.107		.355	
Reinvest firms (*n=32*)				
two-tailed *p* (*z*-statistic)	.0085	.0019	.0589	.0146
	.165		.756	
Total (*n=50*)				
two-tailed *p* (*z*-statistic)	.0015	-.0012	.0230	.0099
	.117		.084*	
Payout/reinvest differences				
two-tailed *p* (*t*-test)	.357		.085*	
two-tailed *p* (signed-rank test)		.407		.005

Table 7.9 (continued)

(C) Negative/positive net-of-market return differences			
Two-tailed p (t-test)	.303	.311	
Two-tailed p (signed-rank test)	.205		.655

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

significant on both tests: reinvest firms experience positive net-of-market returns over the year prior to divestiture, while payout firms experience corresponding negative returns. Similar results are obtained for above-median interest coverage and well-performing sellers, as indicated in Tables 7.10 and 7.11. In short, reinvest sellers are significantly more "healthy" than their payout counterparts, on three counts at least. All three differences are consistent with corresponding regularities documented by LPS (p. 11).

7.4 ASSOCIATION BETWEEN SELLER CHARACTERISTICS AND RELATIVE SELLER EFFICIENCY

Sellers are differentiated according to whether they are more or less efficient relative to buyers. The financial characteristics of the two groups are of interest because a successful discrimination is required for hypothesis testing. Tables 7.12 and 7.13 indicate the discriminating power of performance and leverage variables. Significant

Table 7.10

Cumulative abnormal equity returns for payout and reinvest sellers by below- and above-median interest coverage for a matched seller-buyer sample of 85 asset sales.

Announcement period:	[-1, 0]		[-4, 5]	
	Mean	Median	Mean	Median
(A) Below-median interest coverage year prior to sale				
Payout firms (*n=22*)	-.0032	.0003	-.0125	-.0048
two-tailed *p* (*z*-statistic)	.455		.832	
Reinvest firms (*n=21*)	-.0015	.0017	.0085	.0142
two-tailed *p* (*z*-statistic)	.692		.709	
Total (*n=43*)	-.0024	.0017	-.0023	.0093
two-tailed *p* (*z*-statistic)	.617		.566	
Payout/reinvest differences				
two-tailed *p* (*t*-test)	.864		.299	
two-tailed *p* (signed-rank test)		.903		.593
(B) Above median interest coverage year prior to sale				
Payout firms (*n=14*)	-.0225	-.0090	-.0357	-.0300
two-tailed *p* (*z*-statistic)	.474		.812	
Reinvest firms (*n=28*)	.0043	-.0027	.0468	.0098
two-tailed *p* (*z*-statistic)	.272		.547	
Total (*n=42*)	-.0046	-.0042	.0193	-.0043
two-tailed *p* (*z*-statistic)	.639		.566	
Payout/reinvest differences				
two-tailed *p* (*t*-test)	.200		.248	
two-tailed *p* (signed-rank test)		.298		.078*
(C) Below-/above-median interest coverage differences				
Two-tailed *p* (*t*-test)	.838		.534	
Two-tailed *p* (signed-rank test)		.533		.629

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

Table 7.11

Cumulative abnormal equity returns for payout and reinvest sellers by financial performance in the year prior to sale, for a matched seller-buyer sample of 85 asset sales. Poorly performing sellers are firms with negative [-250, -5] net-of-market returns or negative net income for the year prior to sale; well performing sellers are the complement.

Announcement period:	[-1, 0]			[-4, 5]		
	Payout sellers	Reinvest sellers	Difference	Payout sellers	Reinvest sellers	Difference
(A) Poorly performing sellers	n=22	n=18		n=22	n=18	
Mean	-.0098	-.0006		-.0173	.0505	
Median	-.0059	-.0051		-.0067	.0012	
two-tailed p (z-statistic)	.300	.978		.299	.516	
two-tailed p (t-test)			.652			.346
two-tailed p (signed-rank test)			.935			.892
(B) Well performing sellers	n=14	n=31		n=14	n=31	
Mean	-.0122	.0032		-.0282	.0187	
Median	-.0014	.0017		-.0162	.0142	
two-tailed p (z-statistic)	.354	.493		.224	.017**	
two-tailed p (t-test)			.159			.014**
two-tailed p (signed-rank test)			.607			.074*
(C) Poorly/well performing difference						
Two-tailed p (t-test)	.875	.854		.687	.682	
Two-tailed p (signed-rank test)	.846	.351		.604	.141	

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

discrimination is detected on both market and accounting returns (see Table 7.12) and

for total liabilities/total assets (see Table 7.13). When buyers are relatively more

efficient operators, sellers have superior performance parameters, irrespective of the

payout/reinvest decision, and significantly lower total leverage as well, with the diffusion

Table 7.12

Seller profitability characteristics for relative buyer efficiency groups by payout/reinvest sub-samples, for a matched seller-buyer sample of 85 asset sales.

Sub-samples:	Whole sample	Payout firms	Reinvest firms	Payout /reinvest difference
(A) [-250, -5] net-of-market return				
Buyers more efficient than sellers	*n=46*	*n=15*	*n=31*	
Mean	.191	.070	.250	
Median	.123	.059	.133	
Std. dev.	.564	.381	.631	
Two-tailed *p* (*t*-test)				.316
Two-tailed *p* (signed-rank test)				.614
Buyers less efficient than sellers	*n=39*	*n=21*	*n=18*	
Mean	-.058	-.073	-.039	
Median	.005	-.098	.040	
Std. dev.	.389	.389	.401	
Two-tailed *p* (*t*-test)				.293
Two-tailed *p* (signed-rank test)				.437
Difference				
Two-tailed *p* (*t*-test)	.024**	.073*	.041**	
Two-tailed *p* (signed-rank test)	.033**	.089*	.052*	
(B) Net income/total assets				
Buyers more efficient than sellers				
Mean	.052	.024	.065	
Median	.064	.046	.072	
Std. dev.	.056	.085	.028	
Two-tailed *p* (*t*-test)				.017**
Two-tailed *p* (signed-rank test)				.085*
Buyers less efficient than sellers				
Mean	.006	.018	-.008	
Median	.042	.027	.049	
Std. dev.	.145	.050	.209	
Two-tailed *p* (*t*-test)				.095*
Two-tailed *p* (signed-rank test)				.297
Difference				
Two-tailed *p* (*t*-test)	.052	.785	.061	
Two-tailed *p* (signed-rank test)		.205	.010***	
	.001***			

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

Table 7.13

Seller leverage characteristics for relative buyer efficiency groups by payout/reinvest sub-samples, for a matched seller-buyer sample of 85 asset sales.

Sub-samples:	Whole sample	Payout firms	Reinvest firms	Payout /reinvest difference
(A) Interest coverage				
Buyers more efficient than sellers	*n=46*	*n=15*	*n=31*	
Mean	3.022	3.100	2.985	
Median	2.096	1.623	2.336	
Std. dev.	2.830	3.845	2.251	
Two-tailed p (*t*-test)				.899
Two-tailed p (signed-rank test)				.278
Buyers less efficient than sellers	*n=39*	*n=21*	*n=18*	
Mean	12.414	7.326	18.349	
Median	1.650	1.650	1.691	
Std. dev.	39.811	21.515	54.119	
Two-tailed p (*t*-test)				.396
Two-tailed p (signed-rank test)				.500
Difference				
Two-tailed p (*t*-test)	.150	.459	.118	
Two-tailed p (signed-rank test)	.237	.585	.534	
(B) Total liabilities/total assets				
Buyers more efficient than sellers	*n=46*	*n=15*	*n=31*	
Mean	.528	.596	.496	
Median	.528	.564	.521	
Std. dev.	.110	.115	.093	
Two-tailed p (*t*-test)				.003***
Two-tailed p (signed-rank test)				.009***
Buyers less efficient than sellers	*n=39*	*n=21*	*n=18*	
Mean	.572	.592	.548	
Median	.572	.626	.555	
Std. dev.	.174	.189	.157	
Two-tailed p (*t*-test)				.427
Two-tailed p (signed-rank test)				.215
Difference				
Two-tailed p (*t*-test)	.186	.948	.153	
Two-tailed p (signed-rank test)	.021**	.511	.093*	

Table 7.13 (continued)

(C) Long-term liabilities/total assets

Buyers more efficient than sellers	n=46	n=15	n=31	
Mean	.262	.325	.231	
Median	.251	.269	.247	
Std. dev.	.118	.136	.096	
Two-tailed *p* (*t*-test)				.009***
Two-tailed *p* (signed-rank test)				.050**
Buyers less efficient than sellers	n=39	n=21	n=18	
Mean	.285	.326	.238	
Median	.285	.317	.257	
Std. dev.	.147	.123	.161	
Two-tailed *p* (*t*-test)				.062*
Two-tailed *p* (signed-rank test)				.078*
Difference				
Two-tailed *p* (*t*-test)	.425	.991	.850	
Two-tailed *p* (signed-rank test)	.186	.490	.868	

(D) Current liabilities/total assets

Buyers more efficient than sellers	n=46	n=15	n=31	
Mean	.266	.270	.264	
Median	.272	.272	.270	
Std. dev.	.087	.069	.095	
Two-tailed *p* (*t*-test)				.834
Two-tailed *p* (signed-rank test)				.788
Buyers less efficient than sellers	n=39	n=21	n=18	
Mean	.286	.266	.309	
Median	.275	.256	.295	
Std. dev.	.118	.113	.123	
Two-tailed *p* (*t*-test)				.262
Two-tailed *p* (signed-rank test)				.324
Difference				
Two-tailed *p* (*t*-test)	.378	.902	.160	
Two-tailed *p* (signed-rank test)	.417	.962	.221	

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

of significance again suggesting that payout/reinvestment of the sale proceeds is unimportant. The shorter-term debt-related variables, comprising interest coverage and the ratio of current liabilities to total assets, have no discriminatory power. With only one minor exception, significant differences between payout and reinvest sub-samples are obtained on just two variables: total- and long term-liabilities to total assets, and then only for relatively higher buyer efficiency.

At first sight, these results are counter-intuitive. Sellers to more efficient buyers are more healthy than are sellers to less efficient buyers, and less healthy sellers have a propensity to sell to less efficient buyers. The clear inference is that well-performing sellers divest for efficiency purposes, while poorly-performing sellers sell to buyers who fare even worse with respect to the divested asset. Moreover, the strong results for the net-of-market-return for the preceding year suggests that well-performing sellers are *expected* to sell to more efficient buyers, and maximise their gain in the process because more efficient buyers can afford to make high bids. Conversely, more efficient operators appear shy of acquiring businesses from less efficient and poorly-performing sellers, whose buyers possibly are characterised by agency problems in that acquired assets do not appear to generate sufficient returns for their shareholders. Although the possibility of overpayment exists for these buyers, it cannot be inferred from these data. The payout/reinvest group differences on total- and long-term leverage are consistent with the propositions of LPS.

7.5   DETERMINANTS OF EFFICIENCY OF SELLERS RELATIVE TO

BUYERS

The determinants of relative seller efficiency are explored in Table 7.14. Three

models are presented. As there is no theory to guide the selection of variables, the

models are based on a range of explanatory variables thought to represent elements

of the arguments canvassed thus far. Relative seller efficiency is the dependent

variable, and is specified in binary form in a logistic regression[6]. The binary form is

preferred because zeroes reported within the three-year profit contribution period

were possibly masking non-zero numbers, so a binary classification is less prone to

measurement error. Since the logistic regression model is non-linear, the

coefficients are estimated iteratively by maximum likelihood methods. In the

process, observations are assigned the 0 or 1 values of the dependent variable, which

may be compared with the known values to obtain classificational accuracy.

Logistic regression is therefore a discriminant method as well. Unlike coefficients in

an OLS regression, a coefficient value represents the change in the probability of the

dependent variable assuming a given outcome for a unit change in the explanatory

variable. For large sample sizes, and for small absolute coefficient values, the

significance of a coefficient is inferred from the Wald statistic, which follows a χ^2

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6 A logistic regression estimates the likelihood of the dependent variable having a unitary value.
In the present application, this denotes seller inefficiency in relation to the buyer of the divested
asset. The estimational procedure is described in Amemiya (1981). An application in a
divestitures context may be found in Ravenscraft and Scherer (1987, ch. 6). The equation for
estimation is: $\Pr_i (\text{event} \mid Z_i) = e^{BZ_i} / 1 + e^{BZ_i}$, where $\Pr_i$ is the probability of an event given the
independent variables, Z_i. The vector of attributes for firm i is written as Z_i. B is a vector of
coefficients.

Table 7.14

Results of logistic regressions of relative seller efficiency on selected firm profitability and debt variables, for a matched seller-buyer sample of 85 asset sales. Seller efficiency $\geq$ buyer's $= 0$; seller efficiency $<$ buyer's $= 1$. Parenthesised numbers against coefficients are two-tail probabilities of the t-statistics.

$n=85$	Model 1	Model 2	Model 3
χ^2	14.514	9.095	14.870
probability	.002***	.011**	.005***
Overall classification rate (%)	67.86	63.10	67.86
Intercept	2.895	.077	3.022
	(.023)**	(.742)	(.020)**
[-250, -5] net-of-market return	1.017	1.182	1.015
	(.093)*	(.053)*	(.096)*
Interest coverage of prior year	-.093		-.103
	(.098)*		(.085)*
Total liabilities/total assets of prior year	-4.261		-4.374
	(.041)**		(.037)**
Payout/reinvest dummy[†]		.416	
		(.074)*	
Focus dummy[‡]			.152
			(.553)

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.
[†]Payout $=1$, reinvest $= 0$.
[‡]Focus change is given by the relatedness of the divested asset. Divestment of related activities $=1$; unrelated $= 0$.

distribution. Both conditions are considered met in the present application.

The set of explanatory variables in Model 1 is restricted to prior period net-of-market returns and two debt-related variables. Model 2 substitutes a payout/reinvest

dummy for the two debt-related variables because the payout choice is likely to be increasing in debt and interest levels, and Model 3 adds a focus change variable. All three models have satisfactory "goodness of fit" parameters, indicated by the χ^2 probability and the classificational accuracy. All coefficients on the explanatory variables are significant, with the lone exception of focus change, which barely achieves significance at the 10 per cent level even when it is the sole variable (with an intercept). Relatively less efficient sellers (than buyers), which are assigned a value of 1, have consistently positive signs on the prior year net-of-market return, while the debt-related variables are consistently negatively-signed. In other words, the probability of a seller being relatively *less* efficient is increasing in the seller's prior net-of-market returns, but decreasing in interest coverage and total liabilities/total assets. The first result appears counter-intuitive, but given capital market efficiency may be interpreted as investors rewarding managers in anticipation of a divestiture to a more efficient buyer. Debtholders are less willing to advance loan capital to less efficient operators, and so total liabilities/total assets decline as sellers become relatively less efficient than buyers. Likewise, a declining interest coverage ratio increases the likelihood of a relatively less efficient seller. Importantly, the payout/reinvest dummy is correctly signed: a payout (coded 1) increases the chance that the seller is relatively less efficient. However, apart from indicating the empirical significance of selected variables, these results do little to resolve the efficiency *versus* financing debate because efficiency, leverage and payout are apparently inter-related. A case is made later for the omission of

leverage because high leverage can suggest either declining performance (and a need to reduce debt levels), or high growth prospects (and no need to reduce debt levels).

Finally, seller abnormal equity returns are regressed on selected seller and sale characteristics in order to establish that stock price responses have an empirical association with economic factors, even if they are insignificantly different from zero. Since leverage (total liabilities/total assets) for the year prior to sale and relative divestiture size (sale price/prior market value of equity) are significantly positively correlated ($r = .373$, $p = .036$), separate models alternatively including each variable are specified. The results of the OLS estimations are reported in Table 7.15. The estimation for the [-4, 5] announcement window is highly successful, and all variables except total liabilities/total assets are significant. Seller abnormal returns are found to be increasing in profitability and interest coverage in the year prior to the sale, but decreasing in the relative size of the divestiture. The payout and focus change dummies are included in the regressions because their exclusion did not materially alter the structure of the equations. Their coefficients show that sellers' abnormal returns are also increasing in the payout choice, and in divestiture of *related* assets, which is consistent with relative seller inefficiency.

Table 7.15

Results of OLS regressions of seller abnormal equity returns on selected seller and sale characteristics, for a matched seller-buyer sample of 85 asset sales. Parenthesised numbers against coefficients are two-tail probabilities of the t-statistic.

Announcement period:	[-1, 0]		[-4, 5]	
	Model 1	Model 2	Model 1	Model 2
No. of divestitures	85	85	85	85
Adjusted R^2	.132	.127	.807	.716
F value	3.557	3.440	71.365	39.909
probability	.006***	.002***	.000***	.000***
Intercept	-.018	-.011	-.054	-1.490
	(.085)*	(.654)	(.001)***	(.003)***
Net income/value of equity of prior year	.032	.032	.073	.090
	(.049)**	(.053)*	(.004)***	(.005)***
Interest coverage of prior year	.000	.000	.006	.005
	(.000)***	(.001)***	(.000)***	(.000)***
Total liabilities/total assets of prior year		-.014		.116
		(.715)		(.112)
Sale price/value of equity prior to sale	-.009		-.124	
	(.435)		(.000)***	
Payout/reinvest dummy[†]	.011	.011	.026	.051
	(.285)	(.297)	(.095)*	(.012)**
Focus dummy[‡]	.002	.002	.025	.031
	(.866)	(.822)	(.108)**	(.112)**

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

[†] Payout =1, reinvest = 0.

[‡] Focus change is given by the relatedness of the divested asset. Divestment of related activities =1; unrelated = 0.

7.6   CHAPTER SUMMARY

Several empirical regularities have been detected. Payout divestitures are about four times larger than reinvest divestitures, but there is no significant difference in the size of payout and reinvest sellers. Payout sellers have significantly poorer growth prospects and higher long-term leverage than reinvest firms in their *pre*-divestiture year, which supports hypothesis 3, but their interest coverage and prior-period accounting income measures are not significantly different. *Prima facie*, these results are not strongly suggestive of a financing motive.

The absence of significantly positive abnormal returns across the sample of asset sales with announcements dates is possibly attributable to the higher proportion of small divestitures sampled relative to most other studies. This effect has been noted in earlier research, but the reason is unclear. Buyer characteristics, including abnormal returns on acquisition, are found to be invariant with respect to the payout/reinvest choice. Sellers' growth prospects appear to have little market significance irrespective of the disposition of the sale proceeds. In contrast to LPS' findings, no significant differences in abnormal returns are found either between payout and reinvest sellers, or between negative and positive net income sellers. However, reinvest sellers are significantly more "healthy" than their payout counterparts, consistent with LPS. Well-performing sellers appear to divest for efficiency purposes, while counter to the efficiency hypothesis poorly-performing sellers sell to buyers who fare even worse with respect to the divested asset.

The probability of relative seller inefficiency is increasing in sellers' prior net-of-market returns, but decreasing in interest coverage and total liabilities/total assets. A payout increases the chance that the seller is relatively less efficient. However, identifying potential sources of relative seller efficiency does little to resolve the efficiency *versus* financing debate because efficiency, leverage and payout are apparently inter-related.

CHAPTER EIGHT

TESTS OF HYPOTHESES

8.1 INTRODUCTION

In the previous Chapter, various empirical regularities in relation to divestitures were documented. While suggestive of the motives for divestitures, these regularities cannot resolve the competing efficiency and financing arguments. This is the main purpose of the present Chapter, which tests all remaining hypotheses and interprets the results. The key hypotheses for distinguishing the efficiency and financing explanations are tested first and the results considered. One hypothesis relating to relative divestiture size is tested, as are several hypotheses relating focus-change arguments to efficiency and financing arguments. To conclude, empirical relations between focus changes and the payout/reinvest choice are examined in the event there is any overlap.

8.2 HYPOTHESES 1, 2 AND 4: EFFICIENCY *VERSUS* FINANCING EXPLANATIONS

From inspection of the [-1, 0] and [-4, 5] abnormal returns for the whole sample reported in Table 7.3, neither payout nor reinvest divestiture announcements have

significant abnormal returns, in common with the whole sample. However, the [-4, 5] returns on payout divestitures are almost significantly negative at the 10 per cent level, and the difference in returns between payout and reinvest divestitures is nearly significant at the same level. Although weak, this regularity is at odds with a financing explanation, which requires a positive abnormal return for payout divestitures.

Table 8.1 shows a break-down of abnormal returns for all possible payout/reinvest and relative efficiency intersections. This Table presents the core evidence of this thesis. The [-4, 5] abnormal returns are selected for discussion without loss of generality. As before, median returns are considered more reliable than mean returns. The only statistically significant results are obtained for relative seller inefficiency in Panel (A): abnormal returns for payout sellers are significantly negative, while those for reinvest sellers are significantly positive. However, the abnormal returns are insignificantly different from zero when the relative efficiency condition is reversed in Panel (B).

The key results in Table 8.1 are reproduced in Table 8.1A, where hypotheses 1, 2 and 4 are restated in terms of logical expressions. Hypothesis 1 (an efficiency hypothesis) is supported when reinvest divestitures are made to relatively more efficient buyers, but not for payout divestitures. The test of hypothesis 2 (also an efficiency hypothesis) fails to deliver the expected positive net-of-market return for both payout and reinvest divestitures. Hypothesis 4 (the financing hypothesis) fails

Table 8.1

Abnormal equity returns for payout and reinvest sellers by relative seller efficiency with respect to the divested asset, for a matched seller-buyer sample of 85 asset sales.

Announcement periods:	[-1, 0]			[-4, 5]		
	Payout sellers	Reinvest sellers	Difference	Payout sellers	Reinvest sellers	Difference
(A) Sellers less efficient than buyers	*n=15*	*n=31*		*n=15*	*n=31*	
Mean	-.0234	.0095		-.0293	.0188	
Median	-.0015	-.0019		-.0204	.0142	
one-tailed *p* (*z*-statistic)	.050**	.106		.096*	.008***	
one-tailed *p* (*t*-test)			.012**			.005***
one-tailed *p* (signed-rank test)			.078*			.038**
(B) Sellers equally or more efficient than buyers	*n=21*	*n=18*		*n=21*	*n=18*	
Mean	-.0017	-.0114		-.0160	.0089	
Median	-.0059	-.0001		-.0071	.0504	
one-tailed *p* (*z*-statistic)	.419	.243		.171	.259	
one-tailed *p* (*t*-test)			.286			.183
one-tailed *p* (signed-rank test)			.176			.444
(A)-(B) Difference						
Mean	-.0217	.0209		-.0133	.0099	
two-tailed *p* (*t*-test)	.145	.187		.619	.685	
Median	.0044	-.0018		-.0133	-.0362	
two-tailed *p* (signed-rank test)	.248	.165		.585	.130	

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

completely: the significantly negative difference obtained for relatively more efficient buyers is the reverse of that expected. This latter result, together with that for

payout divestitures in hypothesis 1, is in fact consistent with the expectations posited by James, Brown and Mooradian (1994) for asset sales by *distressed* firms.

At first sight, this result is difficult to fathom because distressed sellers have already been excluded from the sample (that is, sellers with interest coverage values below unity). However, a distress explanation is compatible with the demonstrated poor performance and inferior debt-related characteristics of payout sellers (refer Chapter Six), which implies that distress may be inferred by investors even when interest coverage levels above unity[1]. If so, and given the poor financial condition of payout firms, the reduction in shareholder wealth as a result of paying out sale proceeds is arguably attributable to creditor pressure. In distress, divestitures are much more likely debt-driven as debtholders seek to recover the value of their claims before their value is further eroded by continued operations with the incumbent management team, so payouts to debtholders and creditors reduce the value of shareholders' claims commensurately. Although distressed sellers must have some prospect of recovery (else creditors would have precipitated bankruptcy), this is evidently not sufficient to forestall creditor pressure for debt reduction or renegotiation.

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[1] Re-running the tests with a higher interest coverage cut-off (for example, 1.5) to reduce the likelihood of a distress explanation is possible, but results in severe culling of the payout sub-sample. If payout sellers are always poor performers or have poor prospects, and have significant interest or principal repayment obligations, all asset sales are conceivably distress sales.

Table 8.1A

Hypothesised signs/inequalities of sellers' abnormal equity returns on divestiture for the payout/reinvest choice by relative seller efficiency. Buyer efficiency (E_B) is expressed relative to seller efficiency (E_S) for the same divested asset.

Payout status	Median [-4, 5] abnormal return on divestiture announcement	
	Expected value/ relationship	Observed value/ relationship
Hypothesis #1 (efficiency, for $E_S<E_B$)		
Payout	+	$-.0204^{\Psi}$
Reinvest	+	$.0142^{\Psi}$
Hypothesis #2 (efficiency)		
Payout	$AR[E_S<E_B]-AR[E_S{\geq}E_B]>0$	$-.0133$
Reinvest	$AR[E_S<E_B]-AR[E_S{\geq}E_B]>0$	$-.0362$
Hypothesis #4 (financing)		
$E_S<E_B$	$AR[payout]-AR[reinvest]>0$	$-.0346^{\Psi}$
$E_S{\geq}E_B$	$AR[payout]-AR[reinvest]>0$	$-.0575$

$^{\Psi}$ denotes significance at conventional confidence levels (refer Table 8.1 for exact probabilities).

A distress sale perspective potentially explains the dismal showing of hypothesis 2 for payout divestitures because payout is more likely in a distress scenario. Distressed sellers are less likely to seek out more efficient buyers in order to maximise the sale price. This does not imply irrationality or market inefficiency, but simply that sellers intent on a quick sale have to accept a lower price. Hence, in a distress scenario, asset sales are less likely to be made to more efficient buyers.

Irrespective of relative buyer efficiency, distress sales are expected to deliver higher positive abnormal returns to buyers than non-distress sales because distressed firms are likely to reduce the sale price in order to effect a quick sale (see Shleifer and Vishny (1992, p. 1347)). This argument does not depend on payout of the sale proceeds, although this would seem likely. For distress sales, therefore, buyers' abnormal returns should be higher relative to those for acquisitions from non-distressed sellers. On the other hand, if payout sellers are not in financial distress, buyers' abnormal returns should not differ between acquisitions made from payout and reinvest sellers because in the LPS world all sellers are characterised by agency problems. Hence, the only predicted inequality in buyers' abnormal returns is that between acquisitions from distressed *versus* non-distressed sellers. The abnormal return differences already documented in Table 6.6 show there is no significant difference in buyers' abnormal returns between payout and reinvest sellers.

Ideally, buyers' abnormal returns should be observed for a group of distress sales, but since these are not represented in the sample, sellers with low interest coverage ratios (at fiscal year-end prior to sale) are substituted as a surrogate. Since an accounting rule-of-thumb is that an interest coverage ratio approaching two is "fair", and given that sellers with interest coverage values below one have already been excluded, the sample is partitioned into low- and high-interest coverage groups, with a value of 1.5 used to effect the separation. Distress-prone sellers are assumed most represented in the low interest coverage group. Interestingly, the proportions of payout sellers are almost the same in both groups, which militates against a

financing explanation implying an inverse relation between payout and interest

coverage. Buyers' abnormal returns are reported in Table 8.2 according to low- and

high- interest coverage values observed in the sample of 85 asset sales with

announcement dates[2]. Significant differences on low- and high-interest coverage are

Table 8.2

Abnormal equity returns of buyers from sellers with low- and high-interest
coverage in the year prior to sale for a matched seller-buyer sample of 85 asset
sales.

Announcement periods:	[-1, 0]	[-4, 5]
(A) Interest coverage ≤ 1.5 [no. of payout sellers=15; no. of reinvest sellers=18]		
Mean	.0056	.0119
Median	.0073	.0180
two-tailed p (z-statistic)	.374	.248
(B) Interest coverage >1.5 [no. of payout sellers=21; no. of reinvest sellers=31]		
Mean	-.0040	.0010
Median	-.0038	-.0078
two-tailed p (z-statistic)	.367	.904
(A)-(B) Differences		
One-tailed p (t-test)	.099*	.208
One-tailed p (signed-rank test)	.072*	.039**

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

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[2] LPS (p. 17) perform a similar test in an effort to lock out the possibility that payout
divestitures in fact comprise distress sales.

obtained across both announcement windows[3], which is not predicted by a financing explanation. An even stronger association is suggested by correlation of buyers' abnormal returns with sellers' interest coverage ($r = -.761$, $p = .0023$) for the [-4, 5] window, with a similar result for the shorter window.

The preceding analysis suggests that reinvest divestitures are efficiency-driven, while payout divestitures have the stock price response expected for distress sales. The latter exhibit neither the characteristic of efficient redeployment, nor the market response of financing-driven divestitures. Nevertheless, creditor pressure in situations of financial distress does not preclude the possibility that agency problems have prevented managers from selling earlier to more efficient buyers, but a financing explanation does not receive support from the direct tests presented in this section.

A test of a more general model of the payout/reinvest choice is desirable in an effort to resolve the puzzle. This is deferred until later in this Chapter to allow presentation of tests of the focus-based hypotheses, the results of which might aid interpretation of a focus change variable in a more general explanatory model.

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[3] One-tail tests of significance are appropriate because the group differences are in the hypothesised direction.

8.3   HYPOTHESIS 5: RELATIVE DIVESTITURE SIZE

Sale prices relative to sellers' prior equity value are reported in Table 8.3 for

reinvest sellers with below median market-to-book ratios, representing poorer than

average growth prospects. An efficiency rationale requires that sellers with positive

Table 8.3

Relative size of divestitures for reinvest sellers with below median market-to-book ratios by positive/negative announcement abnormal returns, for a matched seller-buyer sample of 85 asset sales.

	Sellers with positive abnormal returns on announcement	Sellers with negative abnormal returns on announcement	Difference
(A) Using [-4, 5] abnormal returns	n=14	n=10	
Mean	.260	.136	.124
Median	.045	.040	.005
Std. dev.	.707	.245	
One-tailed p (t-test)			.301
One-tailed p (signed-rank test)			.407
(B) Using [-1, 0] abnormal returns	n=12	n=12	
Mean	.307	.111	.196
Median	.095	.037	.058
Std. dev.	.758	.228	
One-tailed p (t-test)			.200
One-tailed p (signed-rank test)			.112

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

abnormal returns on divestiture announcement are hypothesised to have relatively larger divestitures than sellers with negative abnormal returns on announcement. The group differences are in fact generally positive whether [-1, 0] or [-4, 5] abnormal returns are used for identification, but the differences are not significant even when employing one-tail tests. Since the number of observations with positive abnormal returns is marginally higher than the number with negative abnormal returns for the [-4, 5] window, an efficiency motive rather than a financing motive is suggested. While no firm inference can be drawn from these results, there is less reason to suggest a financing explanation than an efficiency one.

8.4 HYPOTHESES 6 THROUGH 13A: FOCUS ARGUMENTS

As noted earlier, focus arguments are predicated on the assumption that efficiency gains (losses) are attributable at least in part to increases (decreases) in relatedness between operating activities. Hypothesis 6 is tested in Table 8.4, which shows that buyers exhibit insignificant gains or losses on acquisition, whether or not the acquired assets are related to their existing activities. More importantly, the abnormal return differences between buyers acquiring assets related to their existing activities, and those not, are insignificant except on the signed-rank test for the [-1, 0] window. Thus, hypothesis 6 receives meagre support.

Table 8.4

Sellers' abnormal equity returns for buyers having activities related/unrelated to the divested asset, for a matched seller-buyer sample of 85 asset sales.

Announcement periods:	[-1, 0]			[-4, 5]		
	Buyers of related activities	Buyers of unrelated activities	Difference	Buyers of related activities	Buyers of unrelated activities	Difference
	$n=58$	$n=27$		$n=58$	$n=27$	
Mean	.0006	-.0124		.0184	-.0130	
Median	.0019	-.0059		.0087	.0092	
Two-tailed p (z- statistic)	.928	.295		.457	.401	
Two-tailed p (t-test)			.262			.398
Two-tailed p (signed-rank test)			.097*			.390

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

Hypothesis 7 is tested in Table 8.5, and is completely rejected (that is, the null of no association between sellers' abnormal returns and relatedness arguments cannot be rejected). Thus, there is no evidence of gains being captured by sellers on account of focus-increasing acquisitions by buyers, nor lower returns sustained when buyers make focus-decreasing acquisitions, attributable to agency problems.

Hypothesis 8 is tested in Table 8.6. Absolute (and adjusted) profit contributions are shown, rather than ratios of *post-* to *pre-*divestiture profitability, in order to reveal the scale of the differences. The full sample of 142 matched divestitures is initially employed to maximise industry coverage because some industries are excluded

Table 8.5

Sellers' abnormal equity returns for relatedness/unrelatedness of divested activities to sellers and buyers, respectively, for a matched seller-buyer sample of 85 asset sales. Relatedness exists (does not exist) when a divested asset has 4-digit ANZSIC number the same as (different from) any one of the four main ANZSICs by segment revenue of the seller prior to the divestiture.

Announcement period:	[-1, 0]			[-4, 5]		
	Sellers/ buyers of related/ unrelated activities	Other inter-sections	Difference	Sellers/ buyers of related/ unrelated activities	Other inter-sections	Difference
(A) Sellers of unrelated activities/buyers of related activities						
	n=32	*n=53*		*n=32*	*n=53*	
Mean	.0007	-.0060		.0064	.0096	
Median	.0044	-.0047		.0117	-.0015	
Two-tailed *p* (*z*-statistic)	.941	.366		.563	.722	
Two-tailed *p* (*t*-test)			.548			.929
Two-tailed *p* (signed-rank test)			.369			.314
(B) Sellers of related activities/ buyers of unrelated activities						
	n=11	*n=74*		*n=11*	*n=74*	
Mean	-.0019	-.0037		-.0026	.0100	
Median	-.0049	-.0014		.0092	.0087	
Two-tailed *p* (*z*-statistic)	.851	.536		.873	.611	
Two-tailed *p* (*t*-test)			.912			.808
Two-tailed *p* (signed-rank test)			.814			.969
(A)-(B) differences						
Two-tailed *p* (signed-rank test)			.932			.845

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

owing to insufficient loadings. The above- and below-median partitioning of *pre*-divestiture profitability generates significant differences in both seller and buyer profitability, as reported in the difference Panel for the second and third columns. This in turn provides the foundation of support for the hypothesis. From the difference column in Panel (B), it can be seen that buyers significantly improve the profitability of acquired assets which were producing profit contributions below their industry median, while the same outcome is not replicated for acquired assets producing *pre*-divestiture profit contributions above their industry median. The joint difference between buyer and seller profitability and *pre*-divestiture profitability is significant on a two-tailed signed-rank test, and on both significance tests if one-tail is used given the difference is in the hypothesised direction. Thus, hypothesis 8 is supported: buyers of assets with *pre*-divestiture below-industry median performance exhibit higher profitability than buyers of assets with *pre*-divestiture above-industry median performance.

Hypotheses 9 and 10 relate solely to seller efficiency considerations. Before proceeding to formal testing, seller *post*-divestiture profitability for the sample of 85 matched asset sales is described in Table 8.7. JO perform a similar exercise (see their Table 3), and apply an industry adjustment, which enhances significance. Profit ratios are not differenced from the corresponding industry median value in Table 8.7 because profit ratios are available only for the 23 ASX (two-digit) industry classifications, which are too broad to obtain a reasonable match with the activities of the sampled firms. In any event, to the extent that sellers' activities remain otherwise

Table 8.6

Post-divestiture profitability of divested assets in relation to *pre*-divestiture profitability, for a matched seller-buyer sample of 142 divestitures, reduced by 31 transactions involving ASX industries with less than six transactions. Mean profitability is the average of profit contributions (PRCs) over three years *pre*- and *post*-divestiture. Mean *pre*-divestiture PRCs are determined above- or below-median for the seller's ASX industry only for (seven) industries with six or more sample observations. All divestitures with above- or below-median *pre*-divestiture PRCs are aggregated, and the mean value is reported in this table for sellers. *Post*-divestiture PRCs are the mean PRCs of buyers corresponding to those for sellers in the above- and below-median sellers' sub-samples.

Sub-samples	PRC of divested assets to sellers	PRC of divested assets to buyers	Buyer *less* seller PRC of divested assets
(A) Above-industry median pre-divestiture profitability of divested asset (n=56)			
Mean	2675	2638	-37
Median	1000	752	-248
Std. dev.	3849	7663	
Two-tailed *p* (*t*-test)			.975
Two-tailed *p* (signed-rank test)			.170
(B) Below-industry median pre-divestiture profitability of divested asset (n=55)			
Mean	-1398	295	1693
Median	-184	-23	161
Std. dev.	3708	2493	
Two-tailed *p* (*t*-test)			.005***
Two-tailed *p* (signed-rank test)			.005***
(B)-(A) differences			
Mean	-4073	-2343	
Median	-1184	-775	
Two-tailed *p* (*t*-test)	.000***	.032**	.186
Two-tailed *p* (signed-rank test)	.000***	.009***	.018**

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

unchanged, changes in *post*-divestiture unadjusted income numbers should be

sufficient to indicate a profitability impact because industry-relative earnings could be deteriorating simultaneously with income improvements following a divestiture. All three measures indicate significantly improved profitability in the first year following divestiture, and a marked deterioration in the third year. The reasons for this pattern are not obvious.

Table 8.7

Sellers' reported *post*-divestiture profitability, for a matched seller-buyer sample of 85 asset sales. Year 0 is the year of divestiture.

	No. of observations	Mean	Median	Percentage positive
(A) EBIT/total assets				
Year 0 level	59	.0142	.0442	59.3
Change from year 0 to 1	57	.0431	.0289**	64.9
Change from year 0 to 2	53	.0805	.0296	62.3
Change from year 0 to 3	32	-.0194	-.0499***	25.0
(B) Net income/market value of equity				
Year 0 level	59	.3507	.1456	83.1
Change from year 0 to 1	57	.3310	.0679*	40.4
Change from year 0 to 2	53	.3394	.0909	32.1
Change from year 0 to 3	32	.1203	.0100**	46.9
(C) EBIT/market value of equity				
Year 0 level	59	-.1094	.0997	61.0
Change from year 0 to 1	57	.2937	.0457*	59.6
Change from year 0 to 2	53	.3146	.0670	66.0
Change from year 0 to 3	32	-.1097	-.0107***	50.0

***, **, * denote two-tail significance given by a *t*-test at the 1, 5 and 10 per cent levels, respectively, of profitability changes from the year 0 level.

Hypotheses 9 and 10 are couched in terms of *post*-divestiture accounting profitability of sellers rather than market returns. Although not justified by JO, there are two reasons for not using market returns. First, net-of-market returns anticipate future events, so income measures are necessarily lagged[4]. A materiality filter is therefore applied to maximise the chance of observing *post*-divestiture profitability consequences. Second, a materiality filter reduces the possibility of observing a divestiture in every year, which would result in *post*-divestiture performance coinciding with the seller's full time series of performance results.

The materiality threshold is set at 2.5 per cent of total assets at the beginning of the divestiture year, which is half the minimum prescribed by AAS 5 when a total asset base is appropriate[5]. A lower threshold is set in order to capture more relatively small divestitures, while at the same time excluding trivial ones. For present purposes, the full sample of 142 divestitures is reduced by 31 for divestitures having no focus effect, and by another 52 for divestitures falling below the materiality cut-off point. Subject to minor exceptions, the key result of Table 8.8 is that *post*-divestiture profitability does not differ significantly between focus-increasing and focus-decreasing divestitures. Even if one-tail tests are applied where appropriate, only two differences are significant, and then at the ten per cent level. Thus,

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4 See, for instance, Easton (1985) for evidence.

5 AAS5, para. 11.

hypothesis 9 is not supported. Again, trends in cumulative profitability through time

are difficult to interpret.

Table 8.8

Relation between change in focus and *post*-divestiture changes in seller profitability, for a
matched seller-buyer sample of 59 divestitures. EBIT is earnings before interest and tax but
after abnormals; EAT is earnings after interest, tax and extraordinaries. Focus-increasing (-
decreasing) divestitures are those of assets with activities unrelated (related) to the seller's
other assets.

Profitability measure	Focus-increasing		Focus-decreasing		Difference	
	Mean	Median	Mean	Median	Mean	Median
(A) EBIT/total assets						
Year 0 to year 1 (n=59)	.0558	.0685	.0213	-.0008	.0345	.0693
Two-tailed p (t-test)	.001***		.082*		.671	
Two-tailed p (signed-rank test)		.000***		.023**		.717
Year 0 to year 2 (n=53)	.0664	.0877	.1057	.0143	-.0393	.0734
Two-tailed p (t-test)	.005***		.068*		.190	
Two-tailed p (signed-rank test)		.014**		.198		.212
Year 0 to year 3 (n=32)	-.0792	-.0908	.0679	-.0437	-.1471	-.0471
Two-tailed p (t-test)	.302		.417		.279	
Two-tailed p (signed-rank test)		.077*		.463		.260
(B) EBIT/ value of equity						
Year 0 to year 1 (n=59)	.3612	.1246	.1782	.0095	.1830	.1151
Two-tailed p (t-test)	.000***		.131		.393	
Two-tailed p (signed-rank test)		.002***		.099*		.421
Year 0 to year 2 (n=53)	.3887	.2526	.1820	.0138	.2067	.2388
Two-tailed p (t-test)	.003***		.162		.919	
Two-tailed p (signed-rank test)		.006***		.314		.865
Year 0 to year 3 (n=32)	-.2704	-.1575	.1251	.0273	-.3955	-.1848
Two-tailed p (t-test)	.167		.160		.258	
Two-tailed p (signed-rank test)		.159		.553		.214

Table 8.8 (continued)

(C) EAT/ value of equity						
Year 0 to year 1 (n=59)	-.3874	-.0799	-.2318	-.0637	-.1556	-.0162
Two-tailed p (t-test)	.460		.470		.027	
Two-tailed p (signed-rank test)		.016**		.033**		.269
Year 0 to year 2 (n=53)	-.3862	-.1601	-.2556	-.0306	.1306	.1295
Two-tailed p (t-test)	.124		.172		.290	
Two-tailed p (signed-ranks test)		.001***		.376		.570
Year 0 to year 3 (n=32)	.1200	-.0019	.1208	-.0181	-.0008	.0162
Two-tailed p (t-test)	.465		.214		.789	
Two-tailed p (signed-rank test)		.809		.753		.859

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively. The two-tailed test probabilities for focus-increasing and focus-decreasing sub-samples relate to the difference in the profitability measure between year 0 and a given *post-divestiture year*.

Hypothesis 10 is tested in Table 8.9, from which it can readily be seen that announcement returns are not significantly different from zero for either focus-increasing or focus-decreasing divestitures, and their difference is also insignificant. Thus, hypothesis 10 is also denied support.

The failure of hypotheses 6,7, 9 and 10 should not be generalised to the return consequences of focus changes in general. The corporate strategy literature prescribes focus increases to increase return on investment. Divestiture-induced focus changes are unlikely to be as economically significant as focus changes brought about by policy decisions, which should be more far-reaching. Furthermore, the focus-effects of divestitures could be outweighed by other effects. Efficiency

Table 8.9

Sellers' abnormal equity returns for focus changes associated with divestiture announcements, for a matched seller-buyer sample of 85 asset sales. Focus-increasing (-decreasing) divestitures are those of assets with activities unrelated (related) to the seller's other assets.

Announcement period:	[-1, 0]			[-4, 5]		
	Focus-increasing	Focus-decreasing	Difference	Focus-increasing	Focus-decreasing	Difference
No. of divestitures	48	37		48	37	
Mean	-.0061	-.0002		-.0025	.0225	
Median	-.0012	-.0034		.0093	-.0015	
Two-tailed p (z-statistic)	.398	.983		.795	.554	
Two-tailed p (t-test)			.475			.590
Two-tailed p (signed-rank test)			.601			.838

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.

factors may not be captured in the focus-change metric, while a financing rationale may dominate the impact on returns of a change in focus. Hence, the relation between focus changes and the payout/reinvest choice is of interest, and is addressed later in this Chapter.

The three parts of hypothesis 11 are tested in Table 8.10. For part (i), the proportion of related assets divested in Panel (B) exceeds that of Panel (A), as hypothesised, but no significance test can be applied because there is no underlying distribution. Part (ii) requires the *post-* less *pre*-divestiture profit contribution of divested assets in Panel (B) to exceed that in Panel (A), and part (iii) calls for a

Table 8.10

Relation between proportions of related assets divested, *pre- versus post-*divestiture performance of divested assets, and growth prospects of reinvest sellers with negative and positive abnormal returns around divestiture announcements, for a matched seller-buyer sample of 85 firms.

Announcement period:	[-1, 0]			[-4, 5]		
	Mean	Median	Sum	Mean	Median	Sum
(A) Sellers with negative abnormal returns around divestiture announcements						
No. of observations	25	25	25	19	19	19
[-250, -5] net-of-market return	.1173	.1111		.0823	.0903	
Test metrics						
Proportion of related assets divested in this sub-sample			.342			.312
Post- less *pre-*divestiture profit contribution of divested assets/sale proceeds	.6934	.0266		-.0181	.0179	
Market-to-book ratio	1.897	1.568		1.720	1.232	
(B) Sellers with positive abnormal returns around divestiture announcements						
No. of observations	24	24	24	30	30	30
[-250, -5] net-of-market return	.1777	.1401		.1902	.1208	
Test metrics						
Proportion of related assets divested in this sub-sample			.102			.177
Post- less *pre-*divestiture profit contribution of divested assets	-.0147	.0123		.5776	.0202	
Market-to-book ratio	1.528	1.560		1.714	1.568	

Table 8.10 (continued)

(B)-(A) differences				
Post- less *pre-*divestiture profit contribution of divested assets	-.7081	-.0143	.5957	.0023
two-tailed p (*t*-test);	.187		.185	
two-tailed p (signed-rank test)		.562		.608
Market-to-book ratio	-.369	-.008	-.006	.336
two-tailed p (*t*-test);	.228		.985	
two-tailed p (signed-rank test)		.358		.790

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively. No significance test can be applied to differences in proportions.

similar inequality in the market-to-book ratio. When the [-4, 5] announcement window is used, a positive difference is obtained on the profit difference which is significant when a one-tail *t*-test is applied, but all other differences including those for the market-to-book ratio are insignificant. Thus, there is little support for hypothesis 11.

Hypotheses 12 and 12A are tested in Panel (A) of Table 8.11. In relation to hypothesis 12, firms increasing their focus as a result of divestiture and with low growth opportunities are found to pay out more sale proceeds than they reinvest (.536), but in the absence of an underlying distribution no significance test is available. The same firms have abnormal equity returns insignificantly different from zero for both announcement windows, which was hypothesised. In relation to hypothesis 12A, a higher reinvest rate is observed, and the abnormal returns are significantly positive for the [-4, 5] window. The [-4, 5] abnormals are significantly

Table 8.11

Abnormal equity returns and payout proportions of sellers increasing/decreasing their focus and with low/high growth opportunities, for a matched seller-buyer sample of 85 asset sales.

	[-1, 0]		[-4, 5]		Proportion of payouts
	Mean	Median	Mean	Median	
(A) Test of hypotheses 12 & 12A					
1. Focus-increasing divestitures by sellers with below-median market-to-book values at end of prior fiscal year (n=28)	-.0089	-.0014	-.0171	-.0112	.536
two-tailed p (z-statistic)	.456		.243		
2. Focus-increasing divestitures by sellers with above-median market-to-book values at end of prior fiscal year (n=20)	-.0021	.0003	.0180	.0148	.300
two-tailed p (z-statistic)	.664		.066*		
1. less 2.					
Differences	-.0068	-.0017	-.0351	-.0260	
Two-tailed p (t-test)	.596		.045**		
Two-tailed p (signed-rank test)		.579		.124	
(B) Test of hypotheses 13 & 13A					
1. Focus-decreasing divestitures by sellers with below-median market-to-book values at end of prior fiscal year (n=15)	.0068	.0020	.0648	-.0034	.600
Two-tailed p (z-statistic)	.605		.485		
2. Focus-decreasing divestitures by sellers with above-median market-to-book values at end of prior fiscal year (n=22)	-.0050	-.0048	-.0063	.0091	.273
Two-tailed p (z-statistic)	.654		.711		
1. less 2.					
Differences	-.0118	-.0068	-.0711	.0125	
Two-tailed p (t-test)	.492		.451		
Two-tailed p (signed-rank test)		.853		.711	

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively. No significance test can be applied to differences in proportions.

different between sellers with low and high market-to-book ratios, given that the two-tailed probabilities can be halved on account of the inequality in returns being in the hypothesised direction. Thus, hypotheses 12 and 12A are supported. Hypotheses 13 and 13A are tested in Panel (B) of Table 8.11, but the test fails dismally: all abnormal returns are insignificantly different from zero, as are the differences between low- and high-growth prospect sellers. Since hypotheses 13 and 13A simply reverse the expectations in hypotheses 12 and 12A by switching from focus-increasing sellers to focus-decreasing sellers, it is not clear why one group of hypotheses should receive support, and not the other.

8.5   EXPLANATORY MODELS

This section presents estimations of models of divestiture announcement abnormal returns, the payout/reinvest choice and focus-increasing/decreasing divestitures. The divestiture choice itself (viż., whether to divest, or not) is not modelled because a sub-sample of non-divesting firms was not collected. Since no hypotheses are formally tested through these models, any observed relationships are therefore interpreted as empirical regularities.

In Table 8.12 abnormal equity returns on divestiture announcement are regressed on selected seller and sale characteristics. The range of explanatory variables has been reduced on account of collinearity (indicated by significant correlation) between

Table 8.12

OLS regressions of abnormal equity returns of sellers on seller and sale characteristics, for a matched seller-buyer sample of 85 asset sales. The figures in parentheses against coefficients are two-tail probabilities of the t-statistic.

Announcement period:	[-1, 0]	[-4, 5]
No. of divestitures	85	85
Adjusted R^2	.100	.704
F-value	2.544	33.889
probability	.023**	.000***
Intercept	.005	.008
	(.775)	(.794)
Payout/reinvest dummy[†]	-.011	-.035
	(.328)	(.088)*
Market-to-book ratio of prior year	-.008	-.031
	(.180)	(.006)***
[-250, -5] net-of-market return	.014	.061
	(.242)	(.008)***
Interest coverage ratio of prior year	.000	.005
	(.001)***	(.000)***
Relative seller efficiency[‡]	.006	.020
	(.581)	(.334)
Focus change dummy[φ]	-.000	.020
	(.993)	(.312)

***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.
[†] Payout = 1; reinvest = 0.
[‡] Seller relatively less efficient than buyer =1; seller relatively more efficient than buyer=0.
[φ] Focus increase = 1; focus decrease = 0.

interest coverage and EBIT/total assets (negative), interest coverage and total

liabilities/total assets (positive), EBIT/total assets and total liabilities/total assets

(negative), all measured on prior year data. Since interest coverage relates (current) interest obligations to EBIT, it is the variable most likely to suggest a need for funds, so the other two variables are omitted. There is also significant negative correlation between the [-250, -5] net-of-market return and the market-to-book ratio, but neither variable is deleted. Collinearity increases standard errors on coefficients and hence lowers t-values, but the effect is evidently not serious enough to overly inflate the measured standard error. Further, given that the market-to-book ratio captures expected future returns, a negative or zero relation between *pre*- and *post*-divestiture returns is expected when selling firms are efficient.

Estimation for the longer announcement window is much more successful, and differs significantly from the estimation for the shorter announcement window[6]. The adjusted R^2 of .704 indicates that nearly three-quarters of the variance in abnormal returns is explained by the explanatory variables. Four of the six explanatory variables achieve significance. Abnormal returns on announcement (averaging weakly positive) are decreasing in payout and the market-to-book ratio of the prior year, and increasing in the [-250, -5] net-of-market return and interest coverage of the prior year. The sign on the payout coefficient is the reverse of that expected by a financing explanation, while the negatively-signed market-to-book ratio suggests that *low* growth prospects precede successful divestiture. The insignificance of relative seller efficiency and focus change suggest that abnormal returns accruing to

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6 A Chou-test on the sums of squares differences between the two regression equations is highly significant, with $F=13.67$, $p=.012$.

sellers are not sensitive to these factors, which represent potential sources of gains from efficiency. These results are basically consistent with the earlier descriptive results and hypothesis testing: neither efficiency nor financing explanations enjoy outright support. Distress sales cannot be ruled out because low interest coverage suggests low (or negative) abnormal returns, as does a low prior-year net-of-market return.

The payout decision itself is not modelled by LPS. The model tested here is an empirical one because no underlying choice structure is formally articulated. Any observed regularities therefore cannot resolve efficiency, financing and distress explanations, but may reveal which of these competing explanations is most compatible with the determinants of the payout choice. Table 8.13 presents the results of a logistic regression of the payout choice on a set of explanatory variables which have been selected to represent the essential a priori arguments already presented. Although collinearity among the explanatory variables is not a problem when a maximum likelihood estimator is used, earnings after tax/market value of equity in the prior year is a preferred measure of *pre*-divestiture firm profitability because it is less correlated with other variables than either EBIT/total assets or [-250, -5] net-of-market returns. Leverage measures, such as total liabilities/total assets and short-term liabilities/total assets are excluded because leverage is ambivalent. High leverage may suggest either that asset sales are necessary to reduce debt, or, conversely, that the selling firm has attracted support from debtholders following a successful divestiture.

The estimation reported in Table 8.13 is unsuccessful, with the χ^2 statistic not being significant at conventional levels, an indifferent classification rate and only relative seller efficiency achieving significance. There is a suggestion that relatively inefficient sellers have a higher likelihood of payout than relatively efficient sellers. Furthermore, payout appears not to be associated with other variables representing distress (interest coverage) and agency problems/lack of growth opportunities (market-to-book). The former result is important because it suggests that payout choices are not influenced by degrees of financial distress. Prior year earnings and focus change are highly insignificant, while market-to-book just misses significance at the 10 per cent level. However, it is possible to fashion an expectation on both market-to-book and preceding firm performance, which allows one-tail tests. Managerial efficiency is subsumed in the growth prospects because inefficient managers should have lower growth prospects than their more efficient counterparts. Efficient managers, including entrenched managers, down-size when growth opportunities are meagre. This argument predicts an inverse relation between payout and prior year market-to-book, but no relation to prior year seller performance. The market-to-book ratio in fact has one-tail significance at p=.076 and is negatively signed, and moreover the prior-year earnings to market ratio is (highly) insignificant. This regularity is evidence in support of an efficiency rationale.

Thus far, focus change has had almost no explanatory power in a variety of tests. In case the variable has been measured with error, focus change is specified as the dependent variable in another logistic regression on a similar

Table 8.13

Logistic regression of use of sale proceeds on seller and sale characteristics, for a matched seller-buyer sample of 85 asset sales. Payout = 1; reinvest = 0.

No. of divestitures	85
χ^2	7.322
probability	.197
Overall classification rate (%)	65.88
Intercept	.304
	(.524)
Earnings after tax/market value of equity of prior year	.149
	(.848)
Relative seller efficiency[†]	.452
	(.052)*
Interest coverage of prior year	-.007
	(.464)
Market-to-book ratio of prior year	-.363
	(.153)
Focus change dummy[‡]	.039
	(.871)

The figures in parentheses against the coefficients are two-tail probabilities of the t-statistic. ***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels, respectively.
[†] Seller relatively less efficient than buyer = 1; seller relatively more efficient than buyer = 0.
[‡] Focus-increase = 1; focus-decrease = 0.

set of seller and sale characteristics determined in the same manner as for the

payout choice. The goodness-of-fit parameters in Table 8.14 are more

satisfactory than those for the payout choice, but only prior-year interest

coverage achieves (negative) significance, just falling short of the five per cent

Table 8.14

Logistic regression of focus change on seller and sale characteristics, for a
matched seller-buyer sample of 85 asset sales. Focus increase = 1; focus decrease
= 0.

No. of divestitures	85
χ^2 probability	12.634 .027**
Overall classification rate (%)	69.41
Intercept	1.316 (.006)***
Earnings after tax/market value of equity of prior year	-.651 (.397)
Relative seller efficiency[†]	.1168 (.637)
Interest coverage of prior year	-.143 (.051)*
Market-to-book ratio of prior year	-.290 (.261)
Payout/reinvest dummy[‡]	.071 (.779)

The figures in parentheses against the coefficients are two-tail probabilities of the
t-statistic. ***, **, * denote two-tail significance at the 1, 5 and 10 per cent levels,
respectively.
[†] Seller relatively less efficient than buyer =1; seller relatively more efficient than
buyer = 0.
[‡] Payout = 1; reinvest = 0.

threshold. Focus increases resulting from divestiture are decreasing in prior-year interest coverage; that is, focus increases are more probable following low interest coverage. Low interest coverage suggests a higher risk of distress, but could also be consistent with a financing explanation if poor operating performance increases the costs of accessing capital markets. However, the latter interpretation does not receive empirical support because earnings after tax/market value of equity in the prior year is insignificantly different from zero.

8.6 CHAPTER SUMMARY

Hypothesis 1 (an efficiency hypothesis) is supported when reinvest divestitures are made to relatively more efficient buyers, but not for payout divestitures. The test of hypothesis 2 (also an efficiency hypothesis) fails to deliver the expected positive net-of-market return for both payout and reinvest divestitures. Hypothesis 4 (the financing hypothesis) fails completely: the significantly negative difference obtained for relatively more efficient buyers is the reverse of that expected. Despite controlling for potentially-distressed sellers in the sample selection process, the results on hypotheses 1, 2 and 4 are more consistent with expectations for asset sales by *distressed* firms. In a distress scenario, asset sales are less likely to be made to more efficient buyers, and are more likely to result in a payout. Further support for a distress explanation is provided by evidence that abnormal returns of buyers are

found to be significantly higher for low-interest coverage than high-interest coverage sellers.

The test of hypothesis 5 (on relative divestiture size) is inconclusive. The focus-change hypotheses fare little better. The poor showing of the clutch of hypotheses (numbers 6, 7, 9 and 10) dealing with focus effects casts strong doubt on the existence of a relation between firm returns and divestiture-induced changes in the relatedness structure (or focus) of a seller's activities. Hypothesis 8 is supported: buyers of assets that are relatively poorly-performing in the hands of sellers exhibit higher profitability than buyers of assets with above-median industry performance. Reinvest firms with positive abnormal returns are found not to differ much in their efficiency characteristics from reinvest firms with negative abnormals, so hypothesis 11 is not supported. Hypotheses 12 and 12A are the only focus-related hypotheses to obtain unqualified support. These hypotheses are compatible with an efficiency view of divestitures, and imply that divestiture-driven focus-increases and growth opportunity arguments apply in tandem but, inexplicably, the same argument does not hold for focus decreases (hypotheses 13 and 13A).

Three explanatory models are specified and tested in relation to some of the likely determinants of: (a) abnormal returns around divestiture announcements, (b) the payout/reinvest choice, and (c) divestiture-induced focus changes. The model parameters for abnormal returns are satisfactory, but interpretation of the results in terms of support for efficiency *versus* financing arguments is intricate. For the longer event window, and contrary to the financing hypothesis, payout results in

positive abnormal returns, but the efficiency rationale is also denied direct support with relative seller efficiency and focus change not having any significant impact. Distress sales cannot be ruled out because low interest coverage suggests low (or negative) abnormal returns, as does a low prior-year net-of-market return.

The attempt to model the payout/reinvest choice fails, but it is tentatively concluded that inefficient sellers (relative to buyers) are more likely to pay out sale proceeds when they have meagre growth prospects which, of course, is an efficiency rationale. Estimation of a model of the probability of focus change is only slightly more successful, and suggests that financial distress increases the likelihood of a focus-increasing divestiture.

CHAPTER NINE

SUMMARY AND CONCLUSIONS

9.1   INTRODUCTION

As stated in Chapter 1.2, the primary aim of the thesis is to test the competing efficiency and financing hypotheses. This was done subsequently by identifying buyer efficiency relative to sellers', relating this to the payout/reinvest choice, and analysing the differences in stock price response between the groups. Through this design it was possible to check if differences in payout/reinvest stock price responses were explained by underlying differences in relative efficiency. Since these competing hypotheses have not hitherto been tested, this was identified as the primary contribution of this thesis to the research literature.

A subsidiary objective was to test whether differences in stock price responses between payout and reinvest firms are driven also by differences in the direction of focus change induced by divestiture. Recall also that the analysis is restricted to voluntary divestitures of operating businesses, irrespective of whether all or part of the equity is sold.

The results of hypothesis testing have been summarised in the preceding two Chapters. The purpose of this final Chapter, then, is to establish conclusions from the empirical findings and, in so doing, to show how these satisfy the objectives of this thesis and how the findings contribute to the relevant literature. Possible directions for further research are also identified.

9.2   SUMMARY OF MAIN EMPIRICAL FINDINGS

In contrast to LPS' findings, no significant differences in abnormal returns are found either between payout and reinvest sellers, or between negative and positive net income sellers. However, consistent with LPS, reinvest sellers are significantly more "healthy" than their payout counterparts. Well-performing sellers appear to divest for efficiency purposes, while counter to the efficiency hypothesis poorly-performing sellers sell to buyers who fare even worse with respect to the divested asset.

Empirical support is documented only for hypotheses 1 (in part), 8, 12 and 12A. The results for the first two of these hypotheses relate to the primary objective: that is, to discriminate which of the efficiency and financing explanations better fits the data. Hypothesis 1 (an efficiency hypothesis) is supported when reinvest divestitures are made to relatively more efficient buyers, but not for payout divestitures. Further, buyers of assets that are relatively poorly-performing in the hands of sellers exhibit higher profitability than buyers of assets with above-median industry performance (hypothesis 8). The secondary objective, to determine the degree to which focus arguments may

intervene, was addressed by several hypotheses, but only Hypotheses 12 and 12A obtained unqualified support. The results on these hypotheses were also compatible with an efficiency view of divestitures, and imply that divestiture-driven focus-increases and growth opportunity arguments apply in tandem, that is, are not evidently mutually exclusive.

Empirical regularities detected from estimations of explanatory models must be interpreted with caution, but suggest that relative seller efficiency and focus change have no significant impact on sellers' abnormal returns around announcement. Distress sales cannot be ruled out because low interest coverage suggests low (or negative) abnormal returns, as does a low prior-year net-of-market return. Relatively inefficient sellers are found more likely to pay out sale proceeds when they have meagre growth prospects, which is compatible with an efficiency rationale, while financial distress increases the likelihood of a focus-increasing divestiture.

9.3   CONCLUSIONS

A direct test of the financing *versus* efficiency hypotheses yields scant evidence of a financing explanation for divestitures. This finding is obtained after controlling for distress sales, and including relatively small divestitures in order to reduce the probability of asset sales signalling the financial condition of the seller as well as the conditions surrounding the divestiture. Analysis of abnormal equity returns around divestiture suggests that reinvest divestitures are efficiency-driven, while payout

divestitures have the market response expected for distress sales. Descriptive statistics and logistic analysis of the payout choice strongly suggest these apparent distress sales are consistent with efficient redeployment, and not driven by a financing rationale. For example, abnormal returns of buyers are found to be significantly higher for low-interest coverage than high-interest coverage sellers. The failure of the financing hypothesis means that if agency problems are at all pervasive, they are of comparatively minor magnitude in relation to efficiency considerations.

Thus, the efficiency rationale for divestitures is not challenged. Had a contrary finding emerged, divestitures would have been viewed as (a) second-best financing solutions (from a shareholder perspective), and (b) incompatible with allocative efficiency of capital markets.

The lack of empirical support for most of the focus arguments is surprising, given the empirical regularities previously reported, notably by JO, and the common prescription of the strategy literature that focus increases are a source of efficiency gains. Apart from evidence that buyers increase the profitability of divested assets that formerly exhibited below-industry median profitability (which is consistent with an efficiency rationale), the only other focus-based hypothesis to receive support is one suggesting that firms increasing their focus through divestiture made the payout/reinvest choice consistent with an efficiency rationale. Otherwise, focus changes appear to have little association with efficiency arguments.

The contribution of focus arguments to the efficiency rationale for corporate divestitures is minor. The tenuous showing of focus arguments could be due to several factors. First, Australian firms are more diversified than their North American and European counterparts, with the result that changes in focus induced by a single (even relatively large) divestiture could be of minor economic importance within a multi-segment structure. In other words, it should not be surprising that a focus change at the margin for an already diversified firm has a trivial impact on the firm's returns. Second, to the extent that distress sales are present in the sample, focus considerations are less likely to be reflected in net-of-market returns when distress factors dominate efficiency (and agency) considerations. Finally, another possible contributing factor could be the use of ANZSIC codes as the relatedness metric, which are possibly too coarse to pick up the nuances and the multi-faceted nature of the notion of relatedness[1].

9.4   DIRECTIONS FOR FUTURE RESEARCH

The research design and test metric employed in this thesis allow discrimination between the efficiency and financing hypotheses. Equivalently, the research design effectively isolates outcomes induced by agency problems from outcomes induced by efficiency arguments, and this is accomplished without actually identifying and measuring agency costs. Further research is justified only if improved data become

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[1] Clarke (1989) reports evidence that SIC codes in the United States do not successfully cluster firms with similar characteristic variables

available. Improved data potentially allow (a) a sharper distinction between divestitures made for financing reasons and those made by firms in financial distress, and (b) more insights into the nature of agency problems. In relation to (a), recall that LPS are arguing that divestitures for financing purposes exist at least in theory, yet do not require the seller to be in financial difficulties. Since it is doubtful that a precise notion of what constitutes distress can ever be formulated without improved data, the risk remains (in any research design) that asset sales to raise finance also signal a change in the propensity of sellers to be in financial distress.

In relation to (b), direct measurement of agency costs would strengthen the research design by permitting attribution of relative earnings differences to elements of the agency problem set. For example, sellers' lower returns could be the result of underinvestment. If underinvestment could be observed, it would be possible to confirm the inference that divestitures for financing reasons are driven by agency problems. Since lost opportunities are difficult to observe, let alone quantify, this agency cost is likely to remain unspecified in models using the construct. Other agency costs, such as asset substitution and claim dilution, are no less difficult to measure. Thus, in common with the extant empirical literature, the attribution of negative stock price responses to agency costs cannot be further elaborated and tested.

In relation to focus arguments, however, there is ample scope for an improvement in the relatedness measure. Although ANZSIC industry codes are in common use for

this purpose, principal activities (which are disclosed in annual reports) are more detailed than the ANZSIC codes and may allow finer distinctions to be drawn between related and unrelated activities. However, principal activities are reported in directors' reports only qualitatively, without accompanying financial data, so this problem cannot be resolved. The relation between divestiture-induced focus changes, acquisition-induced focus changes, and policy-driven focus choices in terms of their impact on net-of-market returns deserves articulation. In particular, it would be insightful to look for symmetric market responses between acquisition- and divestiture-induced focus changes: for instance, to address the question of whether net-of-market returns for divestiture of unrelated activities are in the same direction as those for acquisition of related activities.

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APPENDIX 1

SAMPLE OF 142 MATCHED SELLER-BUYER DIVESTITURES

(Companies marked with an asterisk are included in the sub-sample of
85 matched divestitures with announcement dates)

Seller	Business divested	Fiscal year of announce-ment
Adelaide Brighton Cement Holdings Limited	Blue Circle Southern Cement Limited*	1989
	Mainland Cement Limited*	1989
AIDC Limited	Southern Venture Alloys Pty Ltd*	1991
The Australian Gas Light Company	Hunter Pipe Line Company Limited*	1990
	Newcastle Pipe Line Company Limited	1990
	AGL Petroleum (Asia Pacific) Limited	1993
	AGL Petroleum (China) Pty Ltd*	1993
	AGL Petroleum (International) Limited	1993
	AGL Petroleum (Seram) Pty Ltd	1993
	AGL Petroleum Marketing Limited	1993
	AGL Petroleum Operations Limited	1993
	Associated Petroleum Limited	1993
	Australian Interstate Pipeline Company Pty Ltd	1993
	Bridgefield Pty Ltd	1993
	Candolin Pty Ltd	1993
	Moonie Oil NL	1993
	Moonie Pipeline Company Pty Ltd	1993
	Petromin NL	1993
	TMOC Exploration (PNG) Pty Ltd	1993
	TMOC Exploration Pty Ltd	1993
	Transoil NL	1993
Alcan Australia Limited	Aluminium Conductors Limited*	1988
	R & W Vincent*	1993
Amcor Limited	Kelly Maxwell Pty Ltd*	1988
Ariadne Australia Limited	Giant Resources Limited*	1988
Arnotts Limited	Allied Mills Limited*	1987
	Golden Crumpets Co A'sia (Extended) Pty Ltd*	1987
	Celthene Pty Ltd*	1993
Bundaberg Sugar Company Limited	Bundaberg Distilling Company Pty Ltd*	1987

SAMPLE OF 142 MATCHED SELLER-BUYER DIVESTITURES (continued)

The Broken Hill Proprietary Company Limited	Astrapak Limited*	1988
	Craig & Seeley Sales Pty Ltd	1988
	GKG Tool Makers Pty Ltd	1988
	Goyen Controls Co Pty Ltd	1988
	Island Bottlers of Fiji Limited*	1988
	Milperra Developments Pty Ltd	1988
	PT Lamipak Primula Indonesia	1988
	PT Rheem Indonesia	1988
	Rheem Australia Investments Pty Ltd	1988
	Rheem Australia Limited	1988
	Rheem New Zealand Limited	1988
	Vulcan Australia Limited	1988
	Zip Holdings Limited	1988
	Brownbuilt Limited*	1989
Brambles Industries Limited	Personal Data Services Division*	1988
The Bell Group Limited	Bays Transport Services Limited*	1989
	Bell Basic Industries (Queensland) Pty Ltd*[50%]	1989
	Bell Basic Industries (Queensland) Pty Ltd*[50%]	1989
	Bell Freightlines Pty Ltd	1989
	Bell Tyres Pty Ltd	1989
	Belltread Pty Ltd	1989
	Sew Foundries Pty Ltd	1989
	West Moreton Contractors Pty Ltd	1989
	Woodwards Tyres Pty Ltd	1989
Bond Corporation Holdings Limited	Liquor Distributors Pty Ltd*	1987
	Bond Brewing Holdings Pty Ltd*	1989
Boral Limited	Boral Steel Limited*	1991
Burns, Philp & Company Limited	Northern Cement Limited*	1993
BTR Nylex Limited	Dimet Group Limited*	1987
	CPE Australia Limited Group*	1988
	Rigid Plastics Container business*	1988
	Zacuba Pty Ltd*	1988
Bunnings Limited	Amtel Holdings*	1990
C-C Bottlers Limited	RW Clampett & Co Pty Ltd, liquor division*	1988
Coca-Cola Amatil Limited	Steggles Holdings Limited*	1988
Coles Myer Limited	Sandhurst Farms Dairy business*	1992
CSR Limited	CSR Chemicals Limited*	1987
	Macadamia Nuts Pty Ltd*	1987
	Macfarms of Hawaii Incorporated	1987

SAMPLE OF 142 MATCHED SELLER-BUYER DIVESTITURES (continued)

	Arnall's Engineering Pty Ltd*	1988
	Aquila Steel Company Limited*	1989
	CSR Petroleum Limited (including Denison Trough)*	1989
	Kajuara Mining Corporation Pty Ltd*	1989
	Port Waratah Coal Services Limited*	1989
	Western Collieries Limited*	1989
	Austral Brick Pty Ltd*	1990
Email Limited	Dowell Australia Limited*	1989
	Juralco business*	1993
Foster's Brewing Group Limited	Beswick Pty Ltd	1988
	Courage Pub Holdings Limited Group*	1988
F.H. Faulding & Co. Limited	Jasol Chemicals, Whitely products and Bel-Air Chemicals*	1988
The Galore Group Limited	Optic Stores*	1993
Goodman Fielder Limited	Wellington Flour Mills Limited*	1988
	Industrial Equity Limited*	1990
	Agribusiness division*	1991
James Hardie Industries Limited	James Hardie Containers Limited*	1987
	Renhurst Pty Limited*	1987
	Polycell Products Pty Ltd*	1988
	Spicers Paper*	1992
Hudson Conway Limited	Courage Pub Company Holdings*	1990
Industrial Equity Limited	D & J Fowler Pty Ltd*	1990
Kalamazoo Holdings Limited	Traversi Jones Pty Ltd*	1989
Kern Corporation Limited	Sellars Holdings Limited*	1988
Lend Lease Corporation Limited	Australian Eagle Life Insurance Company Limited*	1993
McPherson's Limited	Ajax Cooke Pty Ltd*	1993
North Broken Hill Peko Limited	Hardboards Australia Limited*	1987
National Consolidated Limited	Murfett Regency Pty Ltd*	1988
	Lovelock Luke Pty Ltd*	1991
	Akkord Limited*	1993
	Apex Aluminium Co Pty Ltd	1993
	Bunbury Developments Limited	1993
	Dorf Industries (NZ) Limited	1993
	Dorf Industries Pty Ltd	1993
	Extruded Metals (NZ) Limited	1993
	Extruded Metals Pty Ltd	1993
	Lockwood Manufacturing Limited	1993
	Lookwood Arrow Limited	1993
	Luke and Singer Pty Ltd	1993
	Metalex Pty Limited	1993

SAMPLE OF 142 MATCHED SELLER-BUYER DIVESTITURES (continued)

	Newman-Tonks Pty Ltd	1993
	NKS (Holdings) Pty Ltd	1993
	Ogden Industries (NSW) Pty Ltd	1993
	Ogden Industries Pty Ltd	1993
	The Efco Property Pty Ltd	1993
	Watchguard Incorporated	1993
	Whitco Pty Ltd	1993
The News Corporation Limited	Adpack Containers Pty Ltd*	1989
National Foods Limited	Cheetham Salt & rural business*	1993
OPSM Industries Limited	British Optical Company Pty Ltd*	1988
Pacific Dunlop Limited	Duncan's Holdings Limited*	1993
	H.C. Sleigh Resources Limited	1993
	Tasmanian Board Mills Limited	1993
	Wagga Wagga Holdings Limited	1993
Pelsart Resources NL	Petroz NL*	1989
Petersville Sleigh Limited	Allowrie Foods Australia Limited*	1990
Quest Investments Limited	Austgen Biojet Holdings Pty Ltd*	1990
QUF Industries Limited	Australian United Foods*	1989
Renison Goldfields Consolidated Limited	Tremelling Pty Ltd (Gunpowder copper mine)*	1989
Southern Farmers Group Limited	Dawn Plastics Pty Ltd*	1987
	George Chapman Pty Ltd*	1987
	Milling Industries Limited*	1989
Howard Smith Limited	Moreton and Mourilyan sugar mills*	1988
Southcorp Holdings Limited	Tasmaid Foods Pty Ltd	1987
	Consolidated Foods Limited*	1987
	Provincial Dairies Pty Ltd*	1987
Tooth & Company Limited	Allowrie Foods Australia Limited*	1988
	Allowrie Foods Australia Limited*	1990
	Penfolds Wines*	1990
Wormald International Limited	Enacon Limited*	1988
	Optical Fibre Research Pty Ltd*	1991
Vox Limited	Alco Holdings*	1990
Wesfarmers Limited	Westralian Farmers Transport Pty Ltd	1988
	Westralian Farmers Transport Pty Ltd*	1989

APPENDIX 2

COMPUTATIONAL PROCEDURE FOR ESTIMATING ABNORMAL
EQUITY RETURNS

The event-study methodology for calculating abnormal returns on ordinary stock is similar to that detailed in Dodd and Warner (1983). For each security, i, the market model is used to calculate an abnormal return (AR) for event day t as follows:

$$AR_{it} = R_{it} - \left(\hat{a}_i + \hat{b}_i R_{mt} \right),$$

where R_{it} is the rate of return on security i for event day t and R_{mt} is the rate of return on the All Ordinaries Accumulation Index (which is value-weighted) on event day t. The coefficients $\hat{a}_i$ and $\hat{b}_i$ are ordinary least squares estimates of the intercept and slope, respectively, of the market model regression. The estimation period is from day $t = -139$ to day $t = -20$, being the 120 trading days immediately prior to the first day of the earliest announcement windows trialed, that is, up to and including day -20 relative to the announcement date $t = 0$. Daily abnormal returns, AR_i, are calculated for each security over the interval $t = -4$ to $t = +5$. For a sample of N securities an average abnormal return (AR_t) for each day is defined as

$$AR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} .$$

The average cumulative abnormal return (CAR) from event day T_1 to event day T_2 is defined as

$$CAR_{T_1}^{T_2} = \sum_{t=T_1}^{T_2} AR_t .$$

The expected values of AR_t and CAR are zero in the absence of abnormal performance. The parametric test statistics are the average standardised abnormal return ($ASAR$) and the average standardised cumulative abnormal return ($ASCAR$), respectively. To compute these statistics the abnormal return, AR_{it}, is standardised by its estimated standard deviation S_{it}:

$$SAR_{it} = \frac{AR_{it}}{S_{it}}, \text{ and}$$

$$ASAR_t = \frac{1}{N} \sum_{i=1}^{N} SAR_{it} .$$

Assuming cross-sectional independence of the individual prediction errors, $ASAR_t$ is approximately distributed according to a normal distribution with zero mean and variance $1/N$. Therefore the statistic

$$Z_t = \sqrt{N} * ASAR_t$$

is approximately unit normally distributed. The *ASCAR* is defined as:

$$ASCAR_{T_1}^{T_2} = \sum_{T_1}^{T_2} ASAR_t \,.$$

Assuming serial independence, the statistic:

$$Z = \frac{\sqrt{N}}{\sqrt{T_2 - T_1 + 1}} \sum_{t=T_1}^{T_2} ASAR_t \,,$$

is also distributed as a standard unit normal distribution. The statistic Z is used to test the significance of cumulative average abnormal returns.