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Rethinking the Australian lease decision making research agenda

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Rethinking the Australian lease decision making research agenda

Abstract

This paper examines a number of accounting and financial factors influencing the lease versus borrow and buy decision, particularly with respect to finance leases. The accounting and finance literature reviewed provided a basis for identifying a range of rationales used in lease decision-making in practice. Based on this review, we characterise the lease versus borrow and buy decision as multi-dimensional and multi-factorial. Basic trend analyses of archival, statistical data on leasing in Australia over sixteen financial years (1985-1986 to 2000-2001) was conducted and provided evidence that much of the conventional, theoretical wisdom concerning the factors important in lease versus borrow and buy decisions, particularly those related to accounting precepts and the tax regime, may be misleading. Thus, observed leasing evaluation practices are used as a means to subject the theoretical and empirical literature on leasing decision-making to new scrutiny.

We conclude with suggestions for the development of improved lease or purchase decision frameworks and call for further research in the area that will be more capable of handling multi-dimensionality in lease decision-making. Practical application of this knowledge will improve the decisions of lessees, benefit lessors who provide finance and/or operating leases, and direct accounting policy makers.

1. Introduction

This paper contributes to the descriptive and theoretical literature on lease versus borrow and buy decisions, examining a range of financial, accounting, taxation, firm-specific and asset-specific characteristics affecting leasing decisions and making suggestions on future directions for leasing research in Australia.

Section 2 of the paper commences with an overview of leasing in Australia and an examination of leasing trends over the period 1985-2001. Based on this overview, a number of financial, accounting and other factors identified in the literature are modelled to explain observed lease versus borrow and buy decisions. We then use the trend analyses and a multi-dimensional decision framework in sections 3 through 6 of the paper to elaborate on and support the arguments offered on each of the decision factors and the relationships tentatively hypothesised between them.

Section 3 concerns the financial factors that influence leasing strategies and decisions, while section 4 assesses the impact of Australian accounting standards on financial reporting of leasing transactions and discusses the related research literature on accounting for leasing. Section 5 provides insight into the impact of financial cost, risk aversion and tax benefits on lease evaluation, suggesting that these factors provide means which may help to explain why leasing decisions vary at the micro-level between firms. Section 6 concerns the identification of firm-specific and asset-specific characteristics associated with the choice of operating lease, financial lease, or purchase. In section 7 we derive some conclusions concerning lease decision making in Australia and summarise our suggestions for furthering the Australian leasing research agenda.

2. Leasing in Australia – An overview

The lease industry has been active in Australia since the 1950s (see Bennett 1991) and lease finance continues to play an important role in the Australian corporate sector. For example, while hire-purchase, asset purchase and chattel mortgage collectively make up roughly 50% of the volume of capital equipment financing in Australia, leasing accounts for the remaining 50% (Bennett, Hardaker and Worrall (1997, p.274).

Lease finance commitments made in Australia by lenders to trading and financial enterprises, non-profit organisations, governments, public authorities and individuals during the 1985-1986 to 2000-2001 financial years are provided in *Table 1*.

Table 1 Lease finance commitments in Australia, according to type of lessor

Year	Banks \$m (%)	Money market corporations & others \$m (%)	Finance companies \$m (%)	General financiers \$m (%)	Total \$m (%) ¹
1985- 1986	1150.5 (20.6)	319.4 (5.7)	3848.2 (68.8)	274.4 (4.9)	5592.6 (100)
1986- 1987	1233.6 (22.4)	287.7 (5.2)	3420.9 (62.0)	575.2 (10.4)	5517.4 (100)
1987- 1988	1825.4 (26.9)	412.5 (6.1)	3977.2 (58.5)	578.2 (8.5)	6793.3 (100)
1988- 1989	2329.6 (26.5)	456.2 (5.2)	5106.7 (58.0)	909.1 (10.3)	8801.7 (100)
1989- 1990	2789.8 (33.9)	411.3 (5.0)	4064.8 (49.5)	950.9 (11.6)	8216.7 (100)
1990- 1991	1304.8 (25.0)	278.7 (5.4)	2912.5 (55.9)	713.4 (13.7)	5209.4 (100)
1991- 1992	1275.4 (28.5)	328.1 (7.3)	2559.3 (57.2)	313.8 (7.0)	4476.7 (100)
1992- 1993	1612.4 (32.8)	338.8 (6.9)	2304.2 (46.9)	658.7 (13.4)	4914.1 (100)
1993- 1994	1818.5 (31.1)	450.1 (7.7)	2706.9 (46.3)	870.7 (14.9)	5846.2 (100)
1994- 1995	1922.7 (29.3)	433.7 (6.6)	3115.4 (47.4)	1100.6 (16.7)	6572.4 (100)
1995- 1996	2394 (33.7)	322 (4.5)	3266 (46)	1126 (15.8)	7107 (100)
1996- 1997	2676 (36.3)	366 (5)	3191 (43.2)	1146 (15.5)	7379 (100)
1997- 1998	2995 (33.4)	428 (4.8)	3741 (41.6)	1817 (20.2)	8981 (100)
1998- 1999	3683 (38.8)	357 (3.8)	3762 (39.7)	1682 (17.7)	9484 (100)
1999- 2000	3134 (39.7)	742 (9.4)	2550 (32.3)	1472 (18.6)	7900 (100)
2000- 2001	2063 (34.2)	830 (13.8)	1540 (25.6)	1590 (26.4)	6022 (100)

Adapted from: ABS 1989, p.717, 1992, p.654, 1994, p.714, 1996, p.620, 1998, p.661, 2000, p.682, 2002, p.713.

It is apparent from *Table 1* that in Australia the volume of leasing has exhibited a generally continuous, upward trend from 1985-1990 and from 1993 to 1999, with the exception of the 1991-1992 period. However, from 1999-2000 through to 2000-2001, there was a marked decline in leasing activities in the economy. This decline may be indicative of a ten year cyclical trend, or more likely a result of the introduction of the Goods and Services Tax (GST), which served to lower the prices of some capital items, such as motor vehicles, making the 'buy' option more affordable.

¹ All figures and totals, except percentage calculations, have been taken from sources cited. Raw data for different types of lessors appears to have been rounded to derive the figures provided in the source materials, although grand totals appear to have been derived from unrounded data. Consequently, there is sometimes a \$0.1 million discrepancy between the sums of values for different lessor types and the totals for all lessor types.

Lease commitments increased from \$4.5 billion in 1991-1992 to \$9.5 billion in 1998-1999, and then dropped down to \$6 billion in 2000-2001. As the figures used for comparison purposes are expressed in nominal dollars, rather than real dollars, the decline in leasing commitments in latter periods is understated in real terms, given steady inflationary price increases over the 1985 to 2001 period.²

The figures presented in *Table 1* also illustrate that the contribution made by all types of lessors, other than finance companies, increased between 1985 and 2001. The contribution of banks increased from \$1150.5 million in 1985-1986 to \$2063 million in 2000-2001. Also, between 1985 and 2001 the contribution of general financiers and money market corporations and others increased from \$274.4 million to \$1590 million and from \$319.4 million to \$830 million, respectively, whereas the contribution of finance companies decreased from \$3848.2 million to \$1540 million over the period.

There has also been a drastic change in terms of the relative contribution made towards leasing activities by different type of lessors over the period under consideration. Banks' and general financiers' contributions increased from 20.6% and 4.9% overall to 34.2% and 26.4%, respectively, by 2000-2001. Contribution of money market corporations and others increased from 5.7% to 13.8%, while the contribution of finance companies decreased dramatically from 68.8% to 25.6%. Although the contribution of finance companies continuously declined during the period, finance companies dominated the other sectors (banks, money market corporations and general financiers) in providing lease finance until 1999-2000 when banks then gained the largest market share. By 2000-2001 money market corporations were also outperforming finance companies in providing lease finance.

Information for discerning trends in lease finance commitments, by type of goods leased, are provided in *Table 2*.

² However, the effects of price changes on different categories of leased assets vary. In particular, computers and other technological equipment experienced stable or deflationary price changes across some of the periods covered, while specific price changes affecting other categories outstripped the general inflation rate. It is for this reason that no attempt has been made by the authors to adjust the nominal dollar values to real dollar values.

Table 2 Lease finance commitments in Australia, according to type of goods leased (in \$m)³

Type of goods	1985-1986	1986-1987	1987-1988	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001
Motor vehicles & transport equipment	3084.2 (55.1)	2939.1 (53.3)	3504.1 (51.6)	4845.9 (59.1)	4041.7 (49.2)	2933.5 (56.3)	2733.7 (61.1)	3070.3 (62.5)	3654.9 (62.5)	3992.1 (60.8)	4215 (59.3)	4216 (57.1)	5122 (57.0)	5283 (55.4)	3639 (46.1)	2532 (42.0)
Construction & earth moving equipment	444.2 (7.9)	317.4 (5.8)	306.6 (4.5)	439.3 (5.3)	402.4 (4.9)	260.5 (5.0)	205.9 (4.6)	235.2 (4.8)	279.4 (4.8)	434.1 (6.6)	352 (4.9)	366 (5.0)	409 (4.6)	387 (4.1)	319 (4.0)	216 (3.6)
Agricultural machinery & equipment	216.6 (3.9)	150.3 (2.7)	183.3 (2.7)	243.0 (3.0)	223.9 (2.7)	125.9 (2.4)	131.3 (2.9)	182.7 (3.7)	238.5 (4.1)	243.5 (3.7)	396 (5.6)	489 (6.6)	534 (6.0)	584 (6.2)	328 (4.2)	208 (3.4)
Automatic data processing equipment & office machinery	439.7 (7.9)	765.5 (13.9)	841.8 (12.4)	1138.9 (13.9)	1369.9 (16.7)	884.1 (17.0)	643.2 (14.4)	754.6 (15.4)	805.5 (13.8)	988.1 (15.0)	1122 (15.8)	1139 (15.5)	1591 (17.7)	1610 (17.1)	1996 (25.3)	1924 (32.0)
Shop & office furniture, fittings & equipment	450.8 (8.1)	580.8 (10.5)	653.0 (9.6)	74.9 (0.9)	572.7 (7.0)	400.4 (7.7)	251.1 (5.6)	217.1 (4.4)	233.7 (4.0)	250.6 (3.8)	260 (3.7)	278 (3.8)	278 (3.1)	332 (3.5)	454 (5.7)	342 (5.7)
Other goods	957.0 (17.1)	764.3 (13.8)	1304.5 (19.2)	1459.7 (17.8)	1607.3 (19.5)	605.0 (11.6)	511.6 (11.4)	454.2 (9.2)	634.2 (10.8)	663.9 (10.1)	762 (10.7)	889 (12.0)	1046 (11.6)	1289 (13.7)	1163 (14.7)	802 (13.3)
Total	5592.6 (100)	5517.4 (100)	6793.3 (100)	8801.7⁴ [8201.7]*	8217.9 (100)	5209 (100)	4476 (100)	4914 (100)	5846 (100)	6572 (100)	7107 (100)	7379 (100)	8980 (100)	9485 (100)	7900 (100)	6022 (100)

Adapted from: ABS 1989, p.717, 1992, p.655, 1994, p.714, 1996, p.620, 1998, p.661, 2000, p.682, 2002, p.713

³ All figures and totals, except percentage calculations, have been taken from sources cited. Raw data for different types of goods leased appears to have been rounded to derive the figures provided in the source materials, although grand totals appear to have been derived from unrounded data. Consequently, there is sometimes a \$0.1-0.2 million discrepancy between the sums of values for different types and the totals for all types.

⁴ There is a \$600 million discrepancy in the source data total (ABS 1992) compared to the source data sum of individual types of goods. Therefore, percentages were calculated on the basis of the corrected total of individual types of goods, marked * above. The cause of the discrepancy would appear to be a misprint in the source materials relating to the 'Shop & office furniture, fittings & equipment' category.

As *Table 2* shows, in the earlier periods considered, most leasing in Australia related to motor vehicles, and while motor vehicle and transport equipment leasing continued to dominate in subsequent periods, accounting for the highest dollar amount of lease finance, the amount of motor vehicles and transport equipment leased decreased from \$3 billion to \$2.5 billion over the entire period. The relative share of this equipment type also declined from 55.1% to 42% during the period. Computers and office machinery constitute the second largest group of lease finance commitments from 1987 onwards, when personal computers became generally available, and the dollar value of leasing of this technology continuously increased, aside from a slump in the early 1990s. Computers and office equipment comprised approximately 15% of total lease finance commitments until 1999-2000 when this category increased to 25% and then to 32% in 2000-2001.

These trend analyses indicate that for Australian organisations, leasing decisions have altered over time, not only in overall dollar terms of lease commitments, but also with respect to changes in the composition of the pool of leased assets.

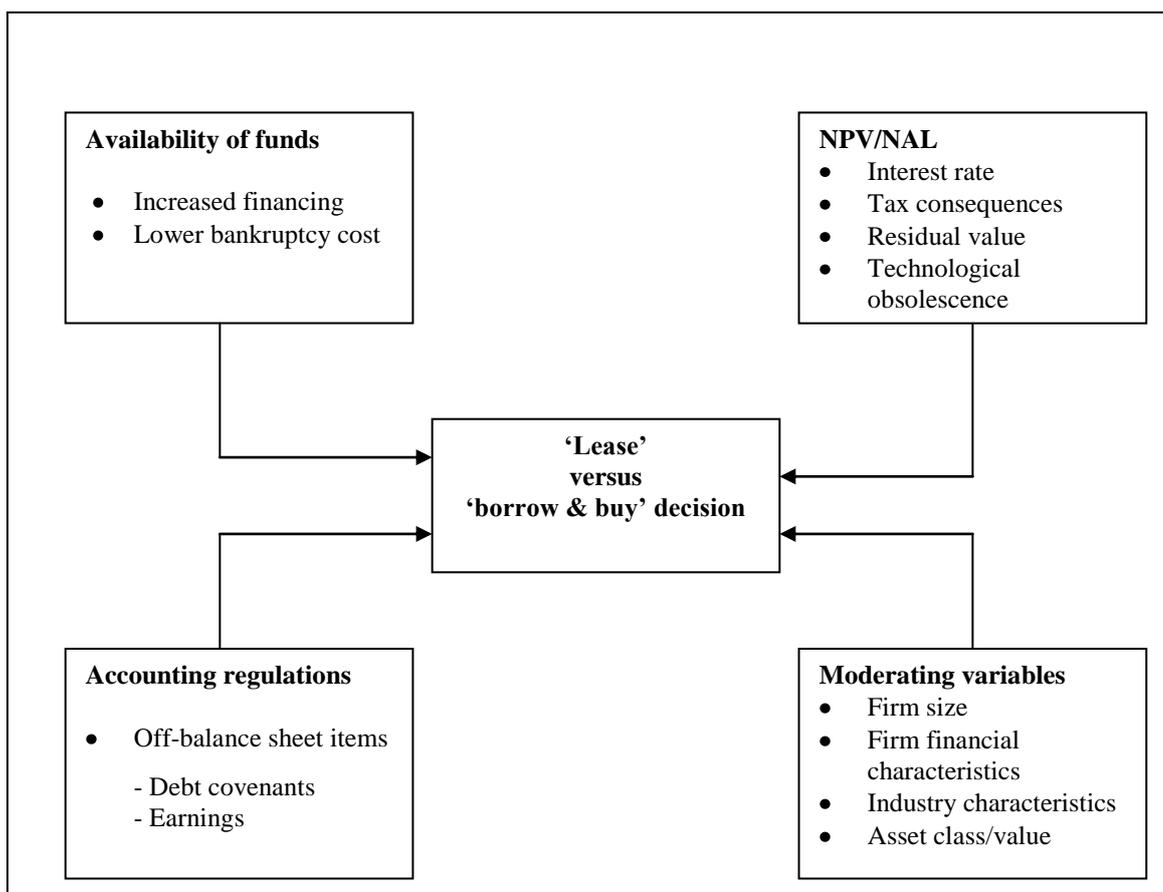
Modelling the lease versus borrow and buy decision

The firm's choice of leasing depends upon the relative advantages of leasing in comparison to acquiring the asset through purchase financed by borrowing. In a perfect capital market, there is no net benefit, or disadvantage, in opting to lease rather than buy, since:

where the purchasing firm (lessee) and the lessor have the same tax status, borrow and lend at the same rate of interest, and have similar expectations regarding the salvage value of the asset, there is no advantage to leasing over purchasing. In practice, these perfect capital market conditions are not satisfied, resulting in a number of rationales for leasing (Lasfer and Levis 1998, pp.3-4).

Based on extant theoretical and empirical literature, we hypothesise that various accounting and financial forces, together with particular firm-specific and asset-specific characteristics, shape the lease versus buy decision, as modelled in *Figure 1*.

Figure 1 **Constituted, multi-dimensional model of lease versus buy decisions**



We posit that the lease versus borrow and buy decision is multi-dimensional. That is, alternative strategies can be evaluated along more than one dimension, even where net economic benefit is the primary objective of decision-making. There are multiple factors involved in determining the advantages or disadvantages of leasing over borrowing and buying and some factors may need to be traded-off against one another to determine net effect. This multi-dimensionality adds to the complexity of lease versus buy decision-making⁵ and to research of the choice process.

The remainder of this paper discusses each component of the model provided in *Figure 1* and relates this discussion to the trend analyses of Australian leasing activity presented previously in this paper.

⁵ For an introductory discussion of multi-dimensional decision-making in an accounting context, see Fatseas, Bisman & Williams 2001, pp.55-58.

3. Availability of funds

It is frequently argued that funds are available more easily and in greater quantity for the lessee, as compared to the purchaser (Sykes 1976; Herst 1984; Krishnan & Moyer 1994; Schallheim 1994). The principal reasons for this availability are that leasing provides increased (100%) financing and has lower bankruptcy cost.

Increased (100%) financing

In the case of leasing, the full cost of an asset normally can be borrowed and secured on that asset (Sykes 1976; Bennett 1991). On the other hand, the secured lender usually will not be prepared to lend the full value of the asset. There are several legal considerations giving rise to this schism between lease versus buy financing:

the lender will normally create a charge over some of the borrower's assets to provide him with security for the loan, and will not be prepared to lend more than 60-70% of the value of this security. This compares with a lessor who is effectively lending 100% of the value of his security, the whole of the cost of the asset to be leased. (The lessor has of course a more direct security: ownership of the asset than just a lien. He therefore has the right to regain possession pending payment of arrears, thus saving the need for a court case to authorise access to the user's premises to recover the asset if necessary). There will therefore be a practical limit to the ratio of debt borrowed, to own capital, of about two to one, which in turn limits the maximum gearing effect possible. But by the same argument, there would be no limit to the extent of a company's possible leasing commitments (Sykes 1976, p.19).

However, it is also argued in the literature that leasing effectively provides less than 100% of the purchase price of an asset, because lease rentals are usually payable in advance (Peirson *et al.* 1998), although where this is the case, the reduction in the percentage of financing on the asset is marginal and certainly much higher than the norm under a mortgage arrangement. Often lease finance is also easier to secure than traditional forms of borrowing for outright purchase.

Sykes' (1976) survey of 202 British firms revealed that over two-thirds of all respondents acknowledged that an important advantage of leasing was that it did not utilise existing working capital. However, only about a quarter of respondents using hire purchase, and about a third of those using leasing, acknowledged 100% financing as an important attribute of these alternatives to borrow and buy. On the contrary, in Dietz's research (1977) (cited in Herst 1984, pp.203-204) respondents in West Germany mentioned 100% financing as the most important reason for leasing, while 100% financing was revealed to be less relevant for Swiss respondents. Herst (1984) explained

the disparity as resulting from differences in the price structure of the German and Swiss capital markets, as well as differences in relevant national tax regulations.

However, we argue that the difference in the importance attached to 100% financing may also be due to differentials in the financial position of organisations. For example, a firm having sufficient available funds will not consider increased (100%) financing as an important factor in favour of leasing, whereas a firm with limited funds may well consider 100% financing an important and attractive aspect of leasing. Thus, such firm-specific financial characteristics may also impact lease versus buy decisions.

Lower bankruptcy cost

In addition to the possible benefits derived from 100% financing through leasing arrangements, it is evidenced in the literature that funds are more easily available in the case of leasing because of lower bankruptcy costs, when compared to secured loan finance. The legal aspects of the argument are that:

leases have lower expected bankruptcy costs for the lessor than secured debt has for the lender, thereby making leasing a preferred financing alternative for firms with a higher potential for financial distress. The legal treatment of the claims of secured creditors is different from the treatment of the claims of secured lenders in bankruptcy. The claims of secured creditors are diluted considerably more than comparable claims of lessors in bankruptcies followed by reorganization (Krishnan and Moyer 1994, pp.32-33).

The preferential treatment of lessors in the event of bankruptcy occurs because ownership of an asset financed through conventional borrowings remains with the borrower, while a lessor retains the ownership rights to an asset during the lease term. Lower bankruptcy costs, seen from the lessor's perspective compared to that of the secured lender, result from the lessee compensating the lessor for anticipated bankruptcy costs. Firms that are high-risk with 'significant bankruptcy potential' can, however, secure lease finance at lower cost than debt finance. 'In such circumstances, lease financing may be the only form of long-term financing available to a high-risk firm' (Krishnan and Moyer 1994, pp.32-33).

Krishnan and Moyer's (1994) US study found that firms using lease finance exhibited different financial characteristics to those firms who did not use lease financing. The authors concluded that as bankruptcy potential increases, lease financing becomes an increasingly attractive financing option, offsetting the higher transaction costs that normally accompany lease agreements versus secured debt agreements.

This finding leads to the expectation that because of lower bankruptcy cost, leasing will be preferred by firms having financial problems, while firms which are

more financially sound would be less likely to prefer the lease alternative. Further to this finding, we argue that if an economy is growing and business prospering, then leasing will become less attractive. This argument is supported in the Australian context by the overall decline in leasing commitments during the 1999-2001 period, illustrated in the trend statistics presented in section 2 of this paper.

While financial factors relating to 100% financing and lower bankruptcy costs associated with leasing impact the leasing decision, many commentators and researchers suggest that the accounting treatment of leases also has economic consequences which are considered in organisational lease versus buy decision-making.

4. Accounting regulations

To understand how the lease versus borrow and buy decision is influenced by the accounting treatment of the lease transaction, it is useful to compare the two options in the light of relevant Australian accounting standards. Prior to the introduction of Australian lease accounting standards, lessees recognised lease payments as expenses over the lease term and all leasing obligations, whether operating or finance lease arrangements, were kept off the lessee's balance sheet.⁶ The introduction of accounting standards AASB1008 'Accounting for Leases', and AAS17 'Leases', require finance leases to be capitalised, involving recognition of a lease liability and associated leased asset in the lessee's balance sheet. However, in the case of operating leases, lessees can treat lease payments as expenses over the lease term and these leases need only be disclosed by way of footnote to the published accounts.

AAS17 and AASB1008 (para.iv) provide that a lease is normally considered to be a finance lease where the lease is non-cancellable, and either:

- The lease term is for 75 percent or more of the useful life of the leased property; however, if the beginning of the lease term falls within the last 25 percent of the total useful life of the leased property, including earlier years of use, this criterion would not be appropriate for purposes of classifying the lease; or
- The present value, at the beginning of the lease term, of the minimum lease payments equals or exceeds 90 percent of the fair value of the leased property to the lessor at the inception of the lease. (The discount rate to be used in calculating the present value, is the interest rate implicit in the lease).

⁶ For a contemporaneous discussion on the disclosure of lease arrangements in financial statements see Kenley & Middleton 1967 and Mathews 1977, pp.48-49.

Further, according to AASB1008 (para 08), a lease is non-cancellable if it:

- can be cancelled only with permission of the lessor or upon the occurrence of some remote contingency; or the lessee, upon cancellation, would be committed to enter into a further lease for the same or equivalent term with the same lessor or a third party related to the lessor; or,
- it provides that the lessee, upon cancellation, would incur a penalty of a magnitude that, in normal circumstances, could be expected to discourage cancellation.

The introduction of lease accounting standards has resulted in the loss of potential advantages accruing to firms by using finance leases as off-balance sheet financing. This loss of benefits is twofold; the accounting standards reduce the ability of firms to circumvent debt covenants through undisclosed lease commitments and secondly, the potential for income smoothing, by expensing rather than depreciating items under lease is foregone (McGregor 1996, p.2). However, there is no clear disadvantage in terms of financial reporting requirements if an asset is acquired by signing a financial lease instead of by borrow and buy which requires mortgage finance to be disclosed. Operating leases still retain debt disclosure advantages compared to finance leases or borrow and buy because accounting standards do not require operating leases to be capitalised.

Various commentators assert that lease finance is often chosen because of its off-balance sheet characteristics (Sykes 1976; Narayanaswamy 1992). It is also frequently argued that accounting requirements to capitalise finance leases impact adversely on lease attractiveness and use (Taylor & Turley 1985; Imhoff & Thomas 1988; El-Gazzer 1993; Godfrey & Warren 1995).

Drury and Braund (1990) studied the impact of off-balance sheet financing in the UK, questioning respondents about the extent to which they believed that companies, other than their own, would seek to structure new lease contracts in a way which did not require capitalisation. 'A sizeable proportion of the respondents (44%) supported the view that firms would replace finance leases with operating leases' (p.188). However, when Drury and Braund 'related this question to the respondents' own company ... the respondents indicated that their firms would not engage in such activities' (p.188). It appears paradoxical that respondents supported the view that other companies would replace finance leases with operating leases, but that their own companies would not. On the basis of these results Drury and Braund (1990) argued that 'many financial managers may think that the market can be misled by off-balance sheet financing' (p.188).

Godfrey and Warren (1995) considered the economic implications of lease capitalisation by examining reactions of lessee firms to Australian lease accounting

standards during 1984-1988. They found that lease capitalisation had an adverse impact on financial leverage and return on assets and that ‘firms reduced their reliance upon finance leases and increased their reliance upon non-lease debt and shareholders’ funds’ (p.226) during the transition period. While capitalisation of financial leases appeared to have adversely affected the use of these leases, there was no corresponding, positive affect on operating leases.

We find these results contradictory and instead argue that there is no definite support for the proposition that off-balance sheet financing influences managers’ financing decisions. We suggest that if finance leases are adversely affected because of capitalisation requirements, then impact of capitalisation can be offset only by an off-balance sheet debt. In other words, if firms are not using finance leases largely because of capitalisation on the balance sheet, then firms would need to replace finance leases with operating leases, rather than non-lease debt which would need to be disclosed in financial statements. However, the results of Godfrey and Warren’s (1995) study are based on lessees’ reactions during the transition period for implementation of Australian lease accounting standard AAS17 and so it would have been difficult for the researchers to predict the impact of AAS17 beyond 1988 when mandatory requirements took effect.

Lucia (1993) also viewed the decline in Australian lease commitments in the 1991-1992 period (see *Table 1*) as being caused by the market’s response to AAS17 and ASRB1008. However, we suggest the decline in lease volume in this period was largely a result of the economic recession. If the reduction in leasing in 1991-1992 was because of the implementation of the lease accounting standard, then either a declining, static or marginally increasing trend would, presumably, have continued into the future as well. Instead, the strong, continuous increase in lease commitments during 1992-1993 to 1998-1999 provides evidence that the decline in 1991-1992 was more likely a result of the recession, rather than the effects of lease accounting standards.

While the economic implications of off-balance sheet assets and/or liabilities, such as operating leases, cannot be ignored, it seems unlikely that off-balance sheet financing can fool sophisticated financial analysts just because it results in favourable accounting numbers on the balance sheet. We conclude that the off-balance sheet nature of leasing does not have the degree of impact on the lease versus buy decision emphasised in the accounting literature and recommend further research of the issue.

5. Net advantage of leasing (NAL)/Net present value (NPV)

In discussing lease versus buy decisions, Schallheim (1994, pp.113) noted that:

The basis of lease versus purchase decision making is net present value (NPV) analysis. The intuition behind this analysis is quite simple. The lessee is saving the cost of purchasing the asset. In return, the lessee commits to a series of lease payments that are generally tax-deductible. The lessee thereby gives up the depreciation tax shields and any other tax credit associated with ownership, forgoes the interest tax shields that come from any debt financing, and loses the salvage value of the asset. NPV analysis compares the present value of all these cash flows in terms of today's dollars. If the NPV is positive, the present value of leasing is superior to purchasing; if the NPV is negative, the present value of purchasing is superior to leasing.

Accordingly, there are several factors associated with NAL and NPV analysis that influence the lease versus buy decision, including:

- interest rate;
- tax consequences;
- residual value analysis.

Interest rate

Within an NPV/NAL context, the interest rate implicit in a lease contract provides a basis for discounting and NPV assessment of the lease. The implicit interest rate is also used in accounting treatments for assets leased under finance leasing arrangements.

At the time of making a lease versus borrow and buy decision, interest rates play a significant role. If an asset is purchased by debt finance, then the owner (borrower) has to pay interest on the amount borrowed. However, if an asset is leased, the lessee is required to make lease payments. When interest rates are high, buying an asset will be considered costlier and less flexible than leasing that asset, while lower interest rates will place leasing at a disadvantage. The decline in leasing activities in Australia during 1999-2000 and 2000-2001 (refer *Table 1*) provides some evidence to support this observation, given that interest rates were relatively low during these periods.

Tax consequences

One of the main economic factors, if not *the* main economic factor, that favours leasing is the tax law. A leasing contract provides the opportunity for a low tax-paying firm to transfer tax shields to a high tax-paying firm where the value of the tax shields is higher. The low tax-paying firm or lessee will benefit by paying lower lease payments (Schallheim 1994, p.62).

When the tax rates of lessors and lessees differ, it is possible to transfer tax benefits through leasing transactions. One of the simple arguments found in the literature is that if a firm in a net operating loss position decides to purchase an asset, it cannot make use of the depreciation tax shields/deductions in the current year. However, if the firm decides to lease the asset from another firm (lessor) which has sufficient taxable income, the benefit can be transferred from the lessee, who cannot use the depreciation tax deductions, to the lessor, who can make use of depreciation deductions immediately against higher marginal tax rates. Through a lease transaction, the firm in a net operating loss position can sell the accelerated depreciation tax shields by paying a reduced lease payment. This argument is supported by recent empirical studies in the US and Canada (Latha 1997; Graham, Lemmon & Schallheim 1998) evidencing that marginal tax rates and the use of leases are inversely related and that tax motivations exist behind lease transactions.

Lucia (1993, p.42) explained the drop in leasing activity in Australian in the 1991-1992 period (see *Table 1*) as being ‘not only caused by the recession but also by lessor tax accounting changes introduced in July 1990, a more flexible and popular commercial hire purchase product and the distorting impact of state stamp duties’. However, if that decline was a result of the tax, hire purchase and stamp duty reasons proffered by Lucia (1993), then that downward trend should have continued into the future as well. Rather, continuous increases in lease commitments during 1992-1999, as evidenced in *Table 1*, provides support for our interpretation that the decline in 1991-1992 was primarily the result of the recession.

Residual value analysis

When a debt contract is paid in full, the asset, along with the ownership rights to the residual value, belong entirely to the borrower. On the contrary, when a lease contract is paid in full, ownership of the asset usually rests with the lessor. At the time a lease contract is signed, the residual value at maturity is uncertain.

Several researchers argue that because of uncertainty surrounding the residual value, decision-makers may select leasing over purchasing (Lease, McConnell & Schallheim 1990; Schallheim 1994). We accept this argument in the case of high-technology assets, such as computers, where obsolescence is rapid and residual value is uncertain and relatively insignificant. However, researchers appear to have over emphasised residual risk and underestimated the benefits of residual value. For example, in the case of land, residual value is expected to be high and relatively certain

and so decision-makers may opt to purchase an asset simply because of its high residual value.

The higher the expected residual value of an asset, the higher the preference for buying the asset and conversely, the more uncertain the residual value of the asset, the more likely the decision-maker will opt for leasing the asset. On the basis of this discussion, we also argue that the impact of residual value in lease versus buy decision making is dependent on the nature, type or class of the asset, which plays a part in circumscribing uncertainty and an asset's rate of obsolescence.

Technological obsolescence and options value

Lessees may have various options available to them under different lease contracts, including those to:

- purchase the asset for a fixed price at the expiry of the lease;
- renew the lease for a fixed period of time; and / or,
- cancel the lease prior to maturity of the lease contract.

Many *operating* leases, for example, allow the lessee the option to cancel the lease early (passing on the risk of obsolescence to the lessor), buy the leased asset at a specified price, extend the life of the lease, or otherwise alter its terms. Such leases are used for assets where the lessor has better control over the obsolescence rate (eg. a computer manufacturer) or when the lessee desires more flexibility (eg. for convenience, or due to technological, market, or other uncertainty). Leasing contracts on assets that involve operating options are likely to be misvalued without proper recognition of the option value, particularly when the leased asset life is long, when the rate of obsolescence is high and unknown (eg. as in computer), or when there is high technological or market uncertainty (Trigeorgis 1996, pp.315-316).

In this way, operating lease contracts can provide more flexibility and options for the lessee in light of various sources of uncertainty. Schallheim (1994, p.155) described technological obsolescence as:

an unpredictable source of risk that can have a devastating impact on the value of an existing asset. For example, when IBM computers ruled the mainframe marketplace, an announcement by IBM about a new generation of computers caused an immediate and sharp decline in the prices of existing computers.

With an operating lease, the lessee has a right to cancel the lease before the expiry of the lease period and this right may be exercised with or without penalty, depending upon the specific clauses written into the lease contract. Therefore, by opting to use operating leases, firms may be able to transfer the risk of technological obsolescence to the lessor, while at the same time, reaping benefits from having the latest technology. Thus 'the

idea that the lease options have value should not be ignored' and decision-makers can implicitly factor the options into the lease or borrow and buy decision (Schallheim 1994, p.181).

These observations lead to an argument that in the case of high risk related to anticipated technological and market uncertainty; lease finance is preferred to buying because of the options value. This position is also supported by Ferrara, Thies and Dirsmith (1980) whose survey research revealed that in Canadian and US industrial firms, computers, vehicles and duplicating equipment were the most heavily leased items due to obsolescence and high service/maintenance characteristics. Their research found that obsolescence was among the top three factors impacting leasing decisions. In US industrial corporations alone, Mukherjee (1991) reported that 82% of firms recognised that avoiding the risk of obsolescence was the most important advantage of leasing relative to other sources of financing.

We argue that uncertainty and the rate of technological obsolescence of particular assets also has a strong influence on the lease versus buy decision in the Australian context. This is evidenced by the data provided in *Table 2*, which shows that computers and motor vehicles, assets of relatively high, future technological uncertainty and rapid obsolescence, constitute about 70% of total lease finance commitments across the 1985-2001 period. Furthermore, despite a 17% decline in overall lease activities in 1999-2000 compared to the previous year, the share of computers increased from \$1.6 billion in 1998-1999 to \$1.9 billion in 1999-2000 (about a 18% increase from one period to the next), probably in large part because of fear of the millennium bug (Y2K).

6. Moderating variables

There are specific characteristics of firms and assets, such as firm size, industry and asset class, which influence the lease versus buy decision (Smith & Wakeman 1985; Schallheim *et al.* 1987; Finucane 1988; Sharpe & Nguyen 1994; Krishnan & Moyer 1994; Schallheim 1994; Adams & Hardwick 1998). Examination of these specific characteristics provides more insight into variations in lease versus buy decision-making.

Firm size

In an analysis of 3000 quoted and unquoted companies in the UK over the 1982-1996 period, Lasfer and Levis (1998) found that the reasons for firms to choose leasing are

not homogeneous across firms of differing sizes. They suggested that in large firms, profitability, leverage and taxation are positively correlated with use of the leasing alternative, while for small firms, growth opportunities, rather than profitability and taxation considerations, drive leasing decisions.

Schallheim *et al.* (1987) found empirical evidence to support the notion of an inverse relationship between firm size and the use of leasing, due to the expected bankruptcy cost advantage of leasing among US-based companies. This finding was supported by Sharpe and Nguyen (1994) who found that leasing by small firms substantially exceeded that of large firms, using number of employees as a proxy for firm size, but because small firms:

are more likely to lease for financial contracting reasons and because there are significant nonconvexities, or indivisibilities, associated with the use of some fixed assets. For example, small firms may have no need for an entire building/property. Also, smaller firms may face greater uncertainty with regard to their future need for any particular piece of capital equipment; thus leasing may serve to minimize other transaction costs such as those associated with resale. In contrast, larger firms are more likely to have alternative internal uses for equipment that is no longer needed in its originally intended use, and they may also have better developed mechanisms for re-marketing equipment (p.11).

Producing partially complementary findings, Adams and Hardwick's (1998, p.493) study of UK listed companies revealed that the propensity to lease or share of leasing tends to decrease as company size increases, up to a certain level, but then tends to increase as company size increases beyond that point. They explained their results, drawing on the work of Drury and Braund (1990):

It seems that very small companies, which are able to make only partial use of capital assets and which face uncertainty regarding their future asset requirements, do indeed rely on leasing arrangements to minimize their costs as they grow. It is plausible that the largest companies (ie. those with turnover in excess of £40m per annum) may be attracted to leasing certain type of assets such as cars and computer equipment using operating rather than finance leasing arrangements.

The preceding discussion of the results of prior studies indicates that firm size and use of leasing are negatively related and that the choice of leasing is also dependent upon asset type or class.

Asset class/value

Smith and Wakeman (1985, p.907) identified several non-tax incentives to lease rather than buy, some of which are asset specific:

(1) if the value of the asset is less sensitive to use and maintenance decisions;

- (2) if the asset is not specialised to the firm; and,
- (3) if the expected period of use is short relative to the useful life of the asset.

In the US context, Sharpe and Nguyen (1994) argued that when the need for assets is unpredictable or temporary, leasing is preferred to purchasing, because a lessee is better able to lock in a short term commitment, as opposed to the purchaser/borrower's longer term obligation.

In general, these findings accord with contracting cost theory precepts used to model make or buy decisions, such as technology (see Helper 1993), asset specificity, frequency and standardisation (see Williamson 1973, 1985, 1991, 1996).

It also appears that the level of leasing may vary systematically according to industry type. Finucane (1988, p.325) argued:

The specificity of an asset to a particular industry, industrywide differences in the level of investment tax credits, the availability of assets for securing mortgage debt, the rate of technological obsolescence of firm-specific assets, the characteristics of secondary asset markets, marginal tax rates, and debt capacity are examples of factors that might differ from industry to industry and might have an impact on the degree to which firms lease assets.

Krishnan and Moyer (1994) confirmed that firms operating in industries where more specific assets are required are less likely to use leasing, finding that organisations in the retail, transportation, mining and wholesale sectors are more likely to lease than firms in manufacturing industries, due to the greater degree of asset specificity associated with manufacturing.

7. Conclusions

Our review of relevant accounting and finance literature leads to several conclusions regarding the lease versus buy decision and the future direction of lease decision making research in Australia. Of particular importance is the observation that lease decision-making is multi-dimensional. Research on lease decision-making, including investigations which relate leasing behaviour to accounting standard capitalisation requirements or taxation advantages, often fails to recognise the affects of a range of other economic, legal, firm-specific and asset-specific variables which confound the lease versus borrow and buy decision. Uni-dimensional studies, attributing causation in respect to asset capitalisation and leasing or tax benefits and leasing, may inadvertently lead to misunderstandings about leasing decisions in practice.

Instead, we conclude that the impact of availability of funds, off balance sheet characteristics of operating leases and tax effects vary according to the financial characteristics of the firm and that the impact of residual value, technological obsolescence and optional pricing is influenced by the nature of the asset. Improved knowledge of the role of these factors in lease decision-making will allow for increased scrutiny of financial devices by lessees and lessors alike and could lead to improved practice.

Secondly, the view that accounting numbers have a significant influence at the time of making a lease versus buy decision is questioned. In the Australian context, it seems that in practice leasing decisions may be more heavily influenced by financial factors and technological considerations, including availability of funds, interest rates, option pricing and obsolescence, than by the off-balance sheet characteristics of operating leases. The literature is not complete with respect to the economic and technical impacts of Australian accounting standards for leases in decisions concerning the choice of operating leases versus finance leases versus borrow and buy. Increased knowledge of how various accounting ratios and earnings are used in the decision would provide further understanding of the effects of lease accounting practices useful in training investors, promoting the supply of relevant accounting information and informing accounting standard policy makers.

Lastly, the impact of moderating variables such as firm size and asset class/value on the lease versus buy is in an early stage of development and has been barely examined in the Australian context. The identification of firm-specific characteristics associated with the choice of operating leases, financial leases or purchase will serve as a reference base from which more advanced study can be made of lease decision making. This information would also serve a more immediate need in helping to better describe the characteristics and needs of Australian lessees for those entities that provide finance for asset acquisitions. This knowledge may also lead to the development of alternative leasing practices where the lessee's financial cost and risk concerns can be alleviated or where the benefit/ attraction of leasing can be optimised. Inquiry into the affects of individual firm-specific and asset-specific characteristics on leasing may help to explain inter-firm variations in adoption and use of different types of leases and ultimately lead to improvements in decision making by investors.

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