Mergers and the market for corporate control: the Canadian evidence

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Abstract. The proposition that a competitive market for corporate control effectively limits managerial divergence from shareholder wealth maximization implies that corporate takeovers are beneficial to shareholders of both firms involved in the transaction. This paper presents the first systematic large-sample study of the valuation effects of Canadian mergers and concludes that these investments indeed create significant gains to shareholders of both bidder and target firms. This evidence, which is particularly interesting in light of extant evidence on the performance of U.S. bidder firms, indicates that the Canadian market for corporate control plays an important role in promoting an optimal resource allocation.

Les fusions et le marché du contrôle des sociétés: le cas canadien. La proposition qui veut qu'un marché concurrentiel du contrôle des sociétés limite effectivement les écarts entre la stratégie des gestionnaires et celle qui maximise la richesse des actionnaires a pour corrollaire que les prises de contrôle des sociétés sont bénéfiques pour les actionnaires des deux sociétés impliquées. Ce mémoire présente les résultats de la première étude systématique de grande envergure des effets de valeur nette actualisée des fusions au Canada. On en vient à la conclusion que ces investissements ont engendré des gains significatifs pour les actionnaires à la fois des firmes qui ont pris le contrôle et des firmes capturées. Ces résultats, particulièrement intéressants à la lumière des résultats qui existent sur la performance des sociétés américaines qui ont effectué des prises de contrôle, indiquent que le marché canadien du contrôle des sociétés joue un rôle important dans la promotion d'une allocation optimale des ressources.

INTRODUCTION

In publicly held corporations ownership of the firm's common stock is frequently dispersed across a large number of stockholders, while control over the firm's productive resources is left with a relatively small group of managers

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who themselves hold few, if any, of the company's shares. The notion that this separation of ownership and control inevitably leads to a serious conflict of interest between self-interested managers and the owners of the corporation dates back to Adam Smith.[1] The concern, which was later forcefully restated by Berle and Means (1932), is that in the presence of a passive body of stockholders, there is no major force 'disciplining' incumbent management into acting in the interest of the firm's owners.[2] However, as argued by Manne (1965), a potentially important market force originates in the possibility for the owners to trade the rights to control the corporation. (See also Alchian and Kessel, 1962.) Competition among managerial teams for the right to manage resources limits divergence from shareholder wealth maximization by managers. Indeed, the existence of a well-functioning market for corporate control may explain why the separation of ownership and control observed in large, publicly held corporations in fact has survived as a competitive organizational form.[3]

A corollary of the above positive theory of the market for corporate control is that *both* parties involved in a takeover gain from the transaction. The main purpose of this study is to test this proposition using Canadian mergers and acquisitions. While there is a large body of empirical evidence on the valuation effects of corporate combinations, the evidence is based almost entirely on the history of U.S. corporate acquisitions.[4] The Canadian evidence is generally restricted to various government reports listing possible motives for takeovers and the number of acquisitions across industries on an annual basis (e.g., Globerman, 1977; Lecraw and Thompson, 1978; see also Morin and Chippindale, 1970 and Laiken, 1973). There is also a variety of Canadian studies in the law and economics literature, discussing mainly the legal aspects of mergers in relation to Canadian antitrust policy (e.g., Cohen, 1966; Borgsdorf, 1973; Reschenthaler and Stanbury, 1977; Globerman, 1979). No systematic test of the alleged causes and consequences of mergers is presented

1 'The directors of such [joint-stock] companies, however, being the managers rather of other people's money than of their own, it cannot be well expected, that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company' (Smith, 1937, 700).

2 For a recent discussion of the Berle-Means thesis, see the collection of the articles in vol. 26 (2) of the *Journal of Law and Economics* (1984).

3 As discussed by Fama (1980), in a competitive and efficient labour market the wage revision process can itself amount to full ex post settling up by the manager for his past performance. That is, under certain labour market conditions, the managerial wage rate will adjust to compensate shareholders fully for the wealth loss resulting from his ex post shirking in excess of what was agreed in his ex ante contract, effectively eliminating any concern over the separation of ownership and control in the corporation. The extent to which the managerial labour market in fact imposes this ex post settling up is an empirical issue which will not be addressed here.

4 Indeed, three recent, major review papers in this area do not cite a single study based on Canadian data. See Jensen and Ruback (1983), Halpern (1983), and Roll (1983).

in these studies. With a sample which includes more than 1,900 Canadian corporate acquisitions over the period 1964-83, this paper reports some first evidence on the valuation consequences of merger activity in Canada.

The U.S.-based evidence collectively indicates that the public announcement of a takeover on average is associated with large gains to shareholders of the target firm, while the bidder firm typically realizes only small and statistically insignificant abnormal returns.[5] Although this evidence is consistent with the proposition that competition among bidder firms drives most (if not all) of the rents from the merger to target firm shareholders, it is also generally recognized that the absence of measurable gain to bidder firms may reflect an attenuation bias due to a measurement problem. For example, while target firms are acquired only once, acquiring firms frequently merge with several firms over time. Since abnormal stock returns measure only the unanticipated component of the gains from a takeover, it is possible that a significant part of the gain to the acquiring firm is anticipated prior to the announcement of the merger and therefore is already reflected in the bidder firm's share price. Furthermore, in the United States, the equity of the bidder firm is typically several times the equity of the target firm. Thus, even if the merger gains were split evenly between the bidder and target firms, the gains as a *percentage* of the bidder firm's equity will be much smaller for the bidder than for the target. The precision of the estimated gain is also lower for relatively large bidders, because the normal variation in equity value is large relative to any given dollar gain. There is currently no consensus in the literature as to what extent these measurement problems actually 'hide' the gains to bidder firms, or whether competition drives the bidder gains to zero.

Several unique characteristics of the Canadian takeover market offers the opportunity to provide new insight into the performance of bidder firms in general. For example, as shown below, Canadian bidder and target firms are frequently of approximately the same asset size, which alleviates one of the problems with measuring abnormal returns to bidders. Second, while the U.S. has a long history of strict enforcement of antitrust laws regulating merger activity, the Canadian Combines Investigation Act of 1910 has proved a relatively weak tool for challenging horizontal mergers.[6] The resulting lack of an effective antitrust 'overhang' in Canada has, by U.S. standards, encouraged a relatively large number of horizontal mergers. To the extent that the synergistic gains from a takeover are likely to be larger in horizontal than in non-horizontal mergers, a comparison of the valuation effects of the two

5 Mandelker (1974), Langetieg (1978), Asquith (1983) and Eckbo (1983) show zero or positive abnormal bidder firm performance, while Dodd (1980) and Malatesta (1983) show evidence consistent with zero or negative bidder firm performance.

6 The Combines Investigation Act is a criminal statute designed to protect the public from harm caused by business mergers, monopolies, and agreements to limit competition. Because it is a criminal statute, however, the prosecution must prove all the components of an alleged offense beyond reasonable doubt. This has proved difficult: there has never been a conviction on a monopoly charge, and only one conviction on the merger section. In con-

categories of mergers allows a further test of the proposition that the returns to bidder firms are positive.

A third characteristic of the Canadian market for corporate control is the absence of a uniform set of federal rules regulating takeover activity in all the country's individual provinces.[7] Among the relevant aspects of the regulation of takeover bids are disclosure requirements imposed on the bidder firm, stipulation of minimum time periods before the initial bid and any follow-up offers can be legally executed, and possibilities for exclusion of certain shareholder groups from participation in the offer. As pointed out in several U.S. studies, these and other regulatory aspects are important in determining the incentives to engage in a takeover contest, and therefore generally affect the very functioning of the market for corporate control. (See, e.g., Jarrell and Bradley, 1980 and Eckbo and Langohr, 1985.) Although a detailed examination of the relative impact of the different regulations across provinces goes beyond the purpose of this paper, I provide a basic comparative analysis of the performance of merging firms in Ontario and the western provinces. This comparison is also interesting in the light of the different industrial bases across the two geographical regions, with predominantly mergers in resource industries in the west and mergers in manufacturing / service industries in Ontario.

The rest of the paper is organized as follows. The second section discusses the data sources and the sample design underlying the empirical results, and the estimation methodology is outlined in the third section. The fourth section contains a discussion of the empirical results, and concluding remarks are contained in the fifth section.

DATA SOURCES AND SAMPLE DESIGN

The primary data base of this study consists of 1,930 merger and acquisition bids that were made during the period 1964 through 1983. The cases were identified using the *Merger Register* compiled by Consumer and Corporate Affairs Canada. This *Merger Register* contains a total of 9,294 corporate acquisition bids announced between January 1945 and December 1983 of which 7,559 were announced after January 1964.[8] For each merger, the *Register*

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trast, the U.S. government has prevented several hundred horizontal mergers from being consummated over the last thirty years, alleging these mergers would 'substantially reduce competition,' which is a civil offence under Section 7 of the Clayton Act (Eckbo, 1983; Eckbo and Wier, 1985). A bill to amend the Combines Investigation Act was introduced in April 1984, making mergers and monopolies that reduce competition a civil offence also in Canada. A characterization of Canadian competition policy and how it compares with U.S. antitrust legislation is found in Stanbury and Reschenthaler (1981).

7 See, e.g., 'The Regulation of Take-over Bids in Canada: Premium Private Agreement Transactions', Report of the Securities Industry Committee on Takeover Bids, November 1983.

8 The *Merger Register* has been maintained by the Department of Consumer and Corporate Affairs since 1960. It attempts to record all reported mergers in industries subject to the

records the identity of the bidder and target firms, the newspaper in which the merger is announced, and a short summary of the major activity of the two firms involved. Starting with January 1964, every case on the *Merger Register* was screened for possible inclusion in the sample. The sampling procedure requires that the bidder or the target firm is among the firms on the University of Laval data tape, which contains monthly share prices and returns to Canadian corporations listed on the Toronto Stock Exchange (TSE). Furthermore, a case is included in the sample only if the month and year of the merger announcement in the press are documented in the *Merger Register*, and if there is sufficient share price information on the Laval tape to perform the regression analysis described below.

Tables 1 through 4 list central characteristics of the data base. According to table 1, over the twenty-year sample period (January 1964 through December 1983) the *Merger Register* reports 7,559 acquisition bids, of which 1,930 are included in the sample. Of these, 1,687 acquisitions involve a bidder firm listed on the TSE, while 413 targets were listed on this stock exchange. The number of acquisitions in the sample is fairly evenly distributed over the sample years, with highs in 1969, 1972, and 1977 (132, 158 and 131 cases, respectively) and lows in 1966, 1978, and 1983 (61, 28, and 44 cases respectively).[9]

Table 2 lists the number of horizontal and non-horizontal acquisitions across the data base, classified by two alternative sets of industry codes. The first is the two-digit 'Canadian' code, assigned to each case by Consumer and Corporate Affairs Canada. A total of 1,375 sample mergers have this information available on the *Merger Register*, of which 913 are 'horizontal' and 462 'non-horizontal.' In this classification, a case is horizontal if the bidder and target firms have been assigned the same two-digit industry code. Obviously, a two-digit code implies a relatively aggregated definition of an industry, which is reflected in the large number of cases that are classified as horizontal under this system. Notice, however, that use of the more refined four-digit Standard Industrial Classification (SIC) system also reveals the presence of a relatively large number of horizontal mergers in the data base. I succeeded in collecting four-digit SIC codes for both bidder and target firms in 873 of the 1,930 acquisitions in the data base, using Dun and Bradstreet's *Canadian Key Business Index* and Scott's *Industrial Index* as of the year prior to the year of

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Combines Investigation Act. Accordingly, until the 1976 amendment of the Combines Investigation Act, firms in most of the service sectors of the economy were excluded from the *Register*, Furthermore, the *Merger Register* depends on newscoverage of mergers by the major financial news media, including daily and financial newspapers, trade journals, business magazines and other publications in Canada, the United States, and Britain.

9 The relatively low representation of cases from 1983 in part reflect the data requirement discussed below, as stock returns were avaiable on the Laval tape up through the year 1983 only. Note also that the *Merger Register* contains another 471 mergers where the bidder firms are U.S. corporations trading on the New York Stock Exchange. A separate analysis of these foreign mergers, including cases reviewed (and approved) by the Foreign Investment Review Agency (FIRA), is found in Eckbo (1986).

TABLE 1

The annual number of acquisitions in the *Merger Register* and in the sample, 1964–83

Year of acquisition	Acquisitions in *Merger Register*	Acquisitions in sample	Bidder firm listed on the TSE	Target firm listed on the TSE
1964	197	83	83	7
1965	224	92	91	7
1966	196	61	60	5
1967	212	71	67	10
1968	378	121	116	21
1969	471	132	127	15
1970	409	104	96	12
1971	380	131	122	21
1972	428	158	145	25
1973	354	146	133	28
1974	277	110	96	24
1975	265	87	75	29
1976	316	119	88	38
1977	394	131	87	53
1978	448	28	24	8
1979	510	89	66	30
1980	415	81	66	23
1981	498	96	80	27
1982	573	46	31	17
1983	614	44	34	13
1964–83	7,559	1,930	1,687	413

NOTE The *Merger Register*, which is compiled by Consumer and Corporate Affairs Canada, is the population from which the sample is drawn. A case is included in the sample only if the bidder or the target firm was listed on the Toronto Stock Exchange (TSE) at the time of the merger. The sample excludes 530 cases where the bidder firm is listed on the New York Stock Exchange (see Eckbo, 1986 for a discussion of these foreign takeovers). According to the *Merger Register*, of the 1,930 cases in the sample, 769 were first announced in the *Globe and Mail*, 437 in the *Montreal Gazette*, 86 in the *Financial Post*, 63 in the *Financial Times*, and 21 in the *Vancouver Sun*, while the announcements of 554 cases are distributed across more than fifty other newspapers and trade journals.

the merger announcement. These directories frequently lists several four-digit SIC codes per firm, and I recorded a maximum of four of the first codes listed. Based on the two first digits of these four-digit codes, there are 389 horizontal and 484 non-horizontal (classifiable) cases in the sample. In this classification, a case is horizontal if the bidder and target firms have at least one such two-digit industry in common. Similarly, there are 296 horizontal and 577 non-horizontal cases in the data base if one defines horizontal as having at least one *three*-digit SIC industry in common. Finally, using all four digits of the SIC code, there are 247 horizontal and 626 non-horizontal mergers in the sample.

Table 3 indicates the distribution of these horizontal and non-horizontal cases across the two-digit SIC mining and manufacturing industries in the sample. The two-digit industry is the industry corresponding to the first two digits of the firms' four-digit SIC code. Table 3 is based on *all* the SIC codes

TABLE 2

The annual number of horizontal (H) and non-horizontal (NH) acquisitions, classified by two-digit Canadian industry codes and by four-digit Standard Industrial Classification (SIC) codes. Sample of acquisition with industry codes available for *both* bidder and target firms, 1964–83

	Classification by Canadian two-digit Code		Classification by four-digit SIC Code					
			Two first digits		Three first digits		All four digits	
Year of acquisition	H	NH	H	NH	H	NH	H	NH
1964	46	35	1	3	0	4	0	4
1965	43	28	10	12	8	14	6	16
1966	29	19	9	6	7	8	6	9
1967	0	0	12	9	9	12	8	13
1968	0	0	16	11	13	14	10	17
1969	0	0	14	8	9	13	6	16
1970	50	37	17	7	14	10	11	13
1971	75	33	13	15	11	17	10	18
1972	107	51	10	15	7	18	7	18
1973	97	49	50	86	39	97	34	102
1974	67	39	32	72	26	78	21	83
1975	60	21	33	43	21	55	21	55
1976	81	32	42	53	32	63	27	68
1977	84	44	39	62	34	67	25	76
1978	0	8	7	2	6	3	6	3
1979	51	19	19	16	13	22	11	24
1980	44	18	22	22	15	29	11	33
1981	56	18	28	24	20	32	17	35
1982	23	11	9	6	7	8	5	10
1983	0	0	6	12	5	13	5	13
1964-83	913	462	389	484	296	577	247	626

NOTE The Canadian two-digit industry code is assigned by Consumer and Corporate Affairs Canada and is contained in the *Merger Register*. The four-digit SIC code was assigned using information in Dun and Bradstreet's *Canadian Key Business Index*, and Scott's *Industrial Index* for the year prior to the year of the merger. Note that an acquisition is included in the table *only* if the industrial classification can be made for *both* the bidder and the target firms (a total of 873 mergers satisfy this restriction in the case of the four-digit SIC codes). Furthermore, up to *four* four-digit SIC codes were recorded per firm, all representing part of the major product line of the company. An acquisition is denoted as horizontal if at least one of these four codes is assigned to both the bidder and the target firm. In the 'two first digits' ('three first digits') case it is sufficient that the two (three) first digits of any one of the four four-digit codes are identical for the two firms.

assigned to a given firm, thus a bidder and / or a target may appear in more than one two-digit industry. The extent of the overlap, as explained in the footnote to table 3, is that a bidder firm is on average represented in 2.2 different two-digit industries (including service industries SIC 40-90), while a horizontal (non-horizontal) merger is on average represented by 2.0 (1.5) different two-digit SIC industries. Note also that a case in this table is defined as being horizontal if the *bidder* belongs to the industry in question and if the

TABLE 3

The total number of bidder and target firms, and the number of horizontal and non-horizontal acquisitions, classified by the first two digits of the firms' major four-digit SIC codes. Sample of firms in mining and manufacturing industries (SIC 10-39) only, 1964–83

Two-digit SIC industry	Number of bidder firms	Number of target firms	Number of two-digit horizontal cases	Number of two-digit non-horizontal cases
10 Metal mining	82	22	14	19
12 Bituminous coal and lignite mining	12	2	5	4
13 Oil and gas extraction	135	65	44	40
14 Non-metallic minerals, except fuels	9	6	2	2
15 General building contractors	21	17	3	14
16 Heavy construction contractors	33	10	9	16
17 Special trade contractors	21	10	4	12
20 Food and kindred products	157	100	63	42
21 Tobacco manufactures	9	2	1	7
22 Textile mill products	34	29	13	8
23 Apparel and other textile products	22	18	5	7
24 Lumber and wood products	61	54	24	19
25 Furniture and fixtures	35	28	13	10
26 Paper and allied products	75	48	28	20
27 Printing and publishing	103	54	37	13
28 Chemicals and allied products	89	59	25	32
29 Petroleum and coal products	44	18	9	15
30 Rubber and misc., plastics products	19	33	10	5
31 Leather and leather products	11	8	4	3
32 Stone, clay, and glass products	56	43	20	15
33 Primary metal industries	75	49	14	28
34 Fabricated metal products	82	76	27	36
35 Machinery, except electrical	74	75	23	29
36 Electrical and electronic equipment	76	53	31	27
37 Transportation equipment	53	31	14	19
38 Instruments and related products	7	10	4	1
39 Misc. manufacturing industries	20	23	8	5

NOTE The total number of bidder firms, target firms, two-digit horizontal and two-digit non-horizontal cases in service industries (SIC 40-90) is 682, 350, 175, and 298, respectively. There are no cases in SIC industries 11, 18, and 19. See the *Standard Industrial Classification Manual 1972* for a more detailed definition of the industries. The 'horizontal and non-horizontal' classifications assume that the *bidder* firm is in the two-digit industry shown. Furthermore, a case is counted as horizontal if the bidder and target firms have at least one overlapping two-digit SIC code, which need not always be the two-digit code shown in the table. Acquisitions where information on the industry codes is missing for either the target or the bidder firm are included in the 'bidder' and 'target' columns but not in the 'horizontal' and 'non-horizontal' columns. Note that a bidder or target firm will appear in more than one industry if the firm has been assigned more than one two-digit mining and manufacturing SIC code (using the first two digits of the four-digit SIC code). To see the nature of the overlap of acquisitions across the various industries, note that the three columns other than the 'target' column in the table sum to 1,415, 444, and 448, respectively. Adding industries 40-90, the numbers are 2,097, 794, and 746. With a total of 969 bidder firms having information on SIC codes, and since there are 389 and 484 *different* two-digit horizontal and non-horizontal cases (table 2), each bidder is on average present in 2,097/969 = 2.2 of the two-digit industries listed in the sample. Similarly, each horizontal (non-horizontal) acquisition in the data base is on average present in 2.0 (1.5) of the two-digit industries in the sample.

target and the bidder have at least one two-digit SIC industry in common (which usually is but need not be the two-digit industry listed in the table).

The three industries with the highest representation of cases are 'Oil and gas extraction' (SIC 13, 135 bidder firms, 65 target firms, 44 horizontal and 40 non-horizontal cases), 'Food and kindred products' (SIC 20, 157 bidders, 100 targets, 63 horizontal and 42 non-horizontal cases), and 'Printing and publishing' (SIC 27, 103 bidders, 54 targets, 37 horizontal and 13 non-horizontal cases). The three industries with the lowest representation of cases are "Instruments and related products' (SIC 38, 7 bidders, 10 targets, 4 horizontal and 1 non-horizontal cases), 'Tobacco manufactures' (SIC 21, 9 bidders, 2 targets, 1 horizontal and 7 non-horizontal cases), and 'Non-metallic minerals, except fuels' (SIC 14, 9 bidders, 6 targets, 2 horizontal and 2 non-horizontal cases). Finally, service industries (SIC 40-90) account for 682 bidder firms, 350 target firms, 175 horizontal and 298 non-horizontal mergers, or approximately 30 per cent of the classifiable cases in the data base.

Table 4 lists the number of acquisitions in manufacturing industries classified by the home province of the bidder and target firms. The classification is based on the annual Scott's *Industrial Index*, which contains information on manufacturing firms only, for the year prior to the year of the acquisition. Furthermore, while this *Index* lists companies in Ontario and Quebec over the entire sample period, firms in the western (British Columbia, Alberta, Saskatchewan, Manitoba) and the Atlantic (New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland) provinces were first included in the years 1968 and 1977, respectively. With these restrictions in mind, there is province information available for 764 bidder and 618 target firms in the data base. In 331 cases where the province information is available for both bidder and target firms, the two firms are located in the same province. Ontario is clearly the province with the largest number of classifiable acquisitions: a total of 534 bidders and 412 targets have Ontario as their 'home' province, of which 182 acquisitions occur intraprovincially; 114 bidder and 93 target firms are located in Quebec, with 17 intraprovince acquisitions.

ESTIMATION AND TEST METHODOLOGY

Consistent with the empirical methodology used in 'event studies' in general,[10] and in merger studies in particular, assume that the following market model in excess returns is an appropriate representation of the equilibrium return generating process:

$$r_{jt} - r_{ft} = \alpha_j + \sum_{k=-1}^{+1} \beta_j^k (r_{m,t+k} - r_{f,t+k}) + \epsilon_{jt}, \tag{1}$$

10 The technique of examining share price behaviour around a news 'event' dates back to the study of stock splits by Fama et al. (1969).

TABLE 4

The annual number of acquisitions in manufacturing industries classified by the home province of the bidder (B) and the target (T) firms, 1964–83[a]

Year of acquisition	8272 All firms with province information			Firms in western provinces[c]			Firms in Quebec			Firms in Ontario		
	B	T	B + T[b]	B	T	B + T[b]	B	T	B + T[b]	B	T	B + T[b]
1964	36	25	17	0	0	0	6	7	0	30	18	13
1965	45	23	20	0	0	0	6	7	2	39	16	13
1966	31	14	10	0	0	0	7	1	0	24	13	8
1967	26	22	11	0	0	0	4	7	0	22	15	7
1968	52	23	16	4	0	0	6	3	0	42	20	14
1969	35	35	14	2	2	0	10	5	2	23	28	8
1970	46	27	19	7	6	2	6	1	0	33	09	12
1971	48	35	19	6	10	2	8	2	0	34	39	13
1972	63	50	26	12	11	1	13	8	3	38	31	15
1973	53	41	20	11	7	0	7	6	1	35	28	11
1974	44	56	26	7	16	3	2	6	0	35	34	11
1975	39	45	24	13	12	3	5	10	3	22	23	12
1976	45	39	16	15	11	2	5	1	0	25	27	6
1977	46	47	22	8	10	1	7	5	0	31	32	11
1978	21	5	48	8	1	1	3	1	1	10	3	0
1979	29	28	12	5	6	0	3	5	1	22	17	6
1980	29	29	16	4	10	2	5	5	0	20	14	4
1981	39	39	22	11	4	1	5	9	2	22	25	10
1982	18	16	8	1	1	0	2	3	1	15	12	5
1983	19	19	9	3	4	1	4	1	1	12	13	3
1964-83	764	618	331	115	111	19	114	93	17	534	412	182

a This table is based on information in the annual Scott's *Industrial Index* for the year prior to the year of the acquisition. Scott's *Index* includes firms in manufacturing industries only. Note that while information on firms in Ontario and Quebec is available for the entire sample period, the western and Atlantic provinces were first included in the *Index* in 1968 and 1977. There are only one bidder and four target firms in the Atlantic provinces (New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland) in the data base, given that the province information is available in Scott's *Index*.

b B + T indicates that both the target and the bidder firm is located in the province(s) in question (conditional on such information being available for both firms in Scott's *Index*).

c The 'western provinces' are British Columbia, Alberta, Saskatchewan, and Manitoba.

where

r_{jt} = the realized rate of return on security j over month t,
r_{ft} = the (Wood Gundy) risk-free rate of return over month t,
r_{mt} = the rate of return on a value-weighted portfolio of all stocks traded on the TSE over month t,
ϵ_{jt} = normally, identically distributed, serially uncorrelated zero mean disturbance term.

In the special case where the constant term α_j is equal to zero, equation (1) is

consistent with the Sharp (1964) / Lintner (1965) / Black (1972) Capital Asset Pricing Model (CAPM). I follow Malatesta (1983) and include α_j as part of the *equilibrium* return generating process, as opposed to constraining the intercept term to be zero ex ante. Thus, while the empirical results rely on the assumption of normally distributed security returns (and stationarity of the distribution of excess returns), the more restrictive assumptions of the CAPM are not necessary.[11]

The OLS estimate of equation (1) is used to create an unbiased forecast of the 'normal' or expected returns to firm j over event month r, where r is defined relative to the month of the merger announcement and is outside of the estimation period. In order to account for the possibility that the merger event itself may change the systematic risk of the firm, two sets of coefficients are estimated, one based on data before the merger event and one based on data after the event. The first set of coefficients, $(\alpha_j^b, \beta_j^{bk})$, is estimated using a maximum of forty-eight and a minimum of twenty-four monthly returns drawn backwards from relative month -13 through month -72. The second set of coefficients, $(\alpha_j^a, \beta_j^{ak})$, is estimated using a maximum of forty-eight and a minimum of twenty-four monthly returns drawn forwards from relative month $+13$ through month $+72$. Month zero is the month of the first announcement of the merger in the press. Abnormal return over event month τ is then computed as

$$\mathrm{AR}_{j\tau} \equiv \begin{cases} r_{j\tau} - (r_{f\tau} + \hat{\alpha}_j^b + \sum_{k=-1}^{+1} \hat{\beta}_j^{bk} r_{m,\tau+k}^e) \text{ for } -12 \leqq \tau \leqq 0 \\ r_{j\tau} - (r_{f\tau} + \hat{\alpha}_j^a + \sum_{k=-1}^{+1} \hat{\beta}_j^{ak} r_{m,\tau+k}^e) \text{ for } 1 \leqq \tau \leqq 12, \end{cases} \tag{2}$$

where superscript 'hat' denotes OLS-estimate and $r_{m,\tau+k}^e$ is the k-lag excess return on the market relative to period τ.[12]

Sample-wide statistical inferences are made on the basis of the average abnormal returns (AAR) and cumulative average abnormal returns (CAAR).

11 The two lead and lag terms in equation (1) capture the problem of non-synchronous trading of individual securities, which is particularly important for TSE-listed companies, since a significant portion of TSE firms trade only sporadically. See Scholes and Williams (1977), Dimson (1979), Fowler and Rorke (1983), and Fowler, Rorke, and Vijay (1980). Non-synchronous trading (which means that the monthly security returns are not measured over the same fixed, one-month interval for all securities in every month), induces first-order serial dependence in the measured returns to individual firms and portfolios. Under these conditions, OLS estimates of equation (1) without the lead and lag terms are biased and inconsistent. Addition of the lead and lag terms provide consistent estimates provided the market index is serially uncorrelated. Addition of higher-order lead and lag terms would allow use of actual, multiperiod returns to substitute for missing return observations (Dimson, 1979). The regressions in this paper, however, are based on actual one-period returns only.

12 When a firm has insufficient data to perform the regression in the 'after' period, the 'before' coefficients $(\alpha_j^b, \beta_j^{bk})$ are used to predict returns up through month 2. Similarly, when there is insufficient data to perform the regression in the 'before' period, the 'after' coefficients $(\alpha_j^a, \beta_j^{ak})$ are used to predict backwards through month -2.

That is, for month τ relative to the event AAR is computed as

$$\text{AAR}_\tau \equiv \frac{1}{N_\tau} \sum_{j=1}^{N_\tau} \text{AR}_{j\tau}, \tag{3}$$

where N_τ is the number of firms in the sample having valid ARs in month r. Furthermore, AAR cumulated over L months is defined as

$$\text{CAAR}_L \equiv \sum_{\tau=l}^{L+l-1} \text{AAR}_\tau, \tag{4}$$

where l is the first month in the cumulation, relative to month 0. To infer the statistical significance of CAAR_L, AAR_τ is first standardized by dividing each individual AR_τ by an unbiased estimate of its standard deviation.[13] If the mergers in the sample represent independent events, this average standardized abnormal return (ASAR_τ) is distributed approximately normal with variance $1/N_\tau$.[14] Consequently,

$$Z(\text{AAR}_\tau) \equiv \text{ASAR}_\tau \sqrt{N_\tau} \tag{5}$$

is approximately a standard normal variate under the null hypothesis of $\text{AAR}_\tau = 0$. Furthermore, assuming serial independence in the $Z(\text{AAR}_\tau)$s, it follows that

$$Z(\text{CAAR}_L) \equiv \frac{1}{\sqrt{L}} \sum_{\tau=l}^{L+l-1} Z(\text{AAR}_\tau) \tag{6}$$

is also approximately unit normal under the same null hypothesis.

EMPIRICAL RESULTS

Total sample

Tables 5 through 7 detail the results based on the total sample of bidder and target firms listed on the TSE. The three tables contain the per cent average abnormal return (AAR) and the per cent cumulative average abnormal return (CAAR) to the merging firms over month -12 through 12 relative to the month of the press announcement of the merger. As discussed in the previous section, Z(AAR) and Z(CAAR) are distributed approximately standard normal under the hypotheses that AAR $= 0$ and CAAR $= 0$, respectively. $P0$ is the per centage of the firms that have positive abnormal returns (AR). The dollar values of AAR

13 Let $R_{m\tau} \equiv [1 r_{m,\tau-1}{}^e \; r_{m\tau}{}^e \; r_{m,\tau+1}{}^e]$, a 1×4 vector, R_m = the $T \times 4$ matrix of observations on the independent variables used in the estimation period, and $\hat{\sigma}(\epsilon_j)$ = the unbiased estimate of the standard error of the regression disturbances over the estimation period. Then the standard deviation of $\text{AR}_{j\tau}$ is given by $\hat{\sigma}(\text{AR}_{j\tau}) \equiv \hat{\sigma}(\epsilon_j)[R_{m\tau}(R'_m R_m)^{-1} R'_{m\tau} + 1]^{1/2}$. (See, e.g., Theil, 1971, 122-3).

14 This assumes that any cross-sectional dependence that arises whenever the ARs are derived from regressions based on (partially) overlapping estimation periods, is negligible.

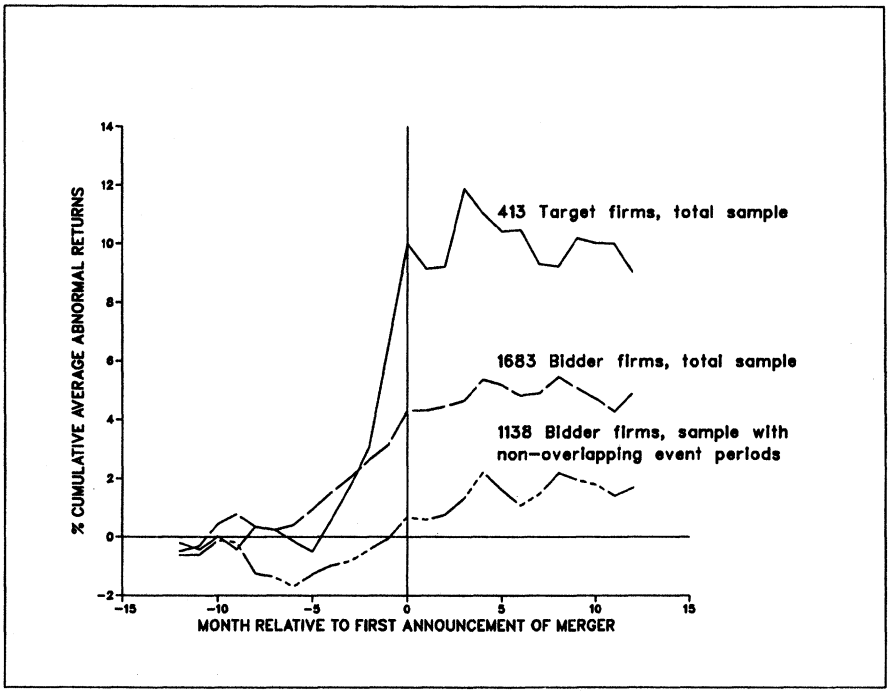

FIGURE 1 Monthly cumulative average abnormal returns relative to the merger announcement; total sample of bidder and target firms, 1964–83

and CAAR are computed by multiplying each individual AR by the market value of total equity in month -12.[15]

As shown in figure 1 and table 5, the 413 target firms in the data base on average earn significantly positive abnormal stock returns as a result of the merger announcement: The AAR is 3.58 per cent over the month of the merger with a Z-value of 6.89. Furthermore, 58.2 per cent of the sample firms show positive abnormal returns over month 0, which rejects the hypothesis of zero abnormal returns on a 1 per cent level using a two-tailed t-test.[16] A positive

15 If this observation is missing, the first available observation following month -12 is used. An alternative to using month -12 as the basis for computing the dollar value of the abnormal returns over the entire $-12,12$ interval is to use monthly updates of the value of equity, starting in month -12. These two alternatives yield only slightly different dollar values. However, only the first strategy is consistent with my procedure for estimating abnormal returns.

16 Under the hypothesis of zero abnormal returns $E(P0) = 50$ per cent and $\text{Var}(P0) = (50 \text{ per cent})(50 \text{ per cent})/N$, where N is the sample size. Note also that, although not reported in table 5, the per cent of the individual abnormal returns over month zero which are significantly positive on a 5 per cent level is $P5 = 16.8$. Under the null hypothesis of zero abnormal returns, $E(P5) \leqq 5$ per cent and $\text{Var}(P5) = (5 \text{ per cent})(95 \text{ per cent})/N$. Thus, nonparametric tests on both $P0$ and $P5$ complement the standardized abnormal return ($Z-$) test in rejecting the hypothesis of zero abnormal returns.

TABLE 5

Per cent average abnormal return (AAR) and cumulative average abnormal return (CAAR) to 413 target firms relative to the merger announcement (month 0)
Total sample, 1964–83

Event month	Firms in average	AAR (%)	Z(AAR)	$P0$ (%)	CAAR (%)	Z(CAAR)	AAR ($m)	CAAR ($m)
−12	356	−0.21	−0.65	45.5	−0.21	−0.65	−0.64	−0.64
−11	356	−0.22	−0.35	45.5	−0.43	−0.71	−1.40	−2.03
−10	354	0.45	1.41	47.7	0.02	0.24	0.27	−1.77
−9	353	−0.46	−0.77	45.9	−0.44	−0.18	−0.23	−2.00
−8	353	0.79	0.67	44.2	0.36	0.14	−0.59	−2.58
−7	354	−0.11	−0.94	44.1	0.25	−0.26	0.05	−2.53
−6	354	−0.39	−0.52	44.1	−0.14	−0.44	−0.66	−3.19
−5	353	−0.36	−0.23	43.9	−0.50	−0.49	0.82	−2.37
−4	351	1.07	2.96	47.9	0.56	0.52	1.28	−1.10
−3	350	1.18	2.23	50.6	1.74	1.20	1.34	0.24
−2	379	1.32	2.89	49.9	3.07	2.02	1.36	1.59
−1	380	3.37	7.01	48.7	6.44	3.96	2.39	3.98
0	369	3.58	6.89	58.2	10.02	5.71	0.60	4.58
1	366	−0.86	−1.71	42.1	9.15	5.05	−0.39	4.20
2	356	0.06	−0.26	45.2	9.21	4.81	0.56	4.76
3	221	2.66	2.23	48.9	11.87	5.21	0.38	5.14
4	222	−0.83	−0.21	43.7	11.04	5.01	0.91	6.05
5	221	−0.62	−1.61	43.0	10.43	4.49	−0.71	5.34
6	221	0.05	0.44	47.5	10.48	4.47	0.65	5.99
7	221	−1.17	−1.57	41.2	9.31	4.00	−1.15	4.85
8	223	−0.08	−0.29	44.4	9.23	3.84	−0.90	3.94
9	224	0.97	1.36	50.9	10.19	4.04	2.23	6.18
10	226	−0.16	0.46	49.6	10.04	4.05	2.05	8.23
11	226	−0.02	0.76	42.5	10.01	4.12	0.95	9.18
12	226	−0.96	−0.99	48.2	9.05	3.84	−1.35	7.83
[−12, 0]				50.6	10.02	5.71		4.58
[−12, −6]				42.6	−0.14	−0.44		−3.19
[−5, −1]				55.1	6.58	6.65		7.17
[−3, 0]				56.1	9.45	9.51		5.68
[−2, 0]				56.4	8.27	9.70		4.35
[−1, 0]				55.0	6.95	9.83		2.99
[1, 3]				43.4	1.86	0.15		0.55
[1, 6]				39.6	0.46	−0.46		1.41
[1, 12]				42.1	−0.96	−0.40		3.25

NOTE AAR, Z(AAR), CAAR and Z(CAAR) are defined in equations (3)–(6). The dollar values of AAR and CAAR are found by multiplying each individual firm's abnormal return by the market value of total equity in month −12. In this sample, the average market value of total equity in month −12 is $50 million. $P0$ is the per cent of the sample with positive abnormal return.

stock price effect is evident also in the four months preceding month 0, indicating that in some cases the market learned about the merger prior to the press announcement date given in the *Merger Register*. Averaging the abnormal returns across cases where the merger news reaches the market at different

points in event time will, if the returns are typically positive, result in the upward drift in the CAAR prior to month 0 seen in figure 1. The CAAR increases to 10.02 per cent from month −12 through month 0, with a Z-value of 5.71. This translates into a statistically significant gain of $4.5 million to the average target firm in the sample.

As is apparent from figure 1 and tables 6 and 7, the average bidder firm also earn significantly positive abnormal returns from the merger announcement. In table 6, which examines the total sample of 1,683 bidders, the AAR over month 0 is 1.17 per cent with a Z-value of 4.56. Over the same month, 52.1 per cent of the bidders have positive abnormal returns, which is significantly greater than the expected value of 50 per cent on a 10 per cent level (two-tailed test). Of the bidder firms 9.4 per cent (not shown in table 6) earn significantly positive (on a 5 per cent level) abnormal returns over month zero. The latter statistic indicates that the distribution of individual standardized abnormal returns is relatively fat-tailed in month zero, complementing the Z-test in rejecting the hypothesis of zero abnormal returns. The CAAR is 4.31 per cent cumulated over the period −12 through 0 (Z-value of 6.50), which translates into a dollar gain of 3.9 million up through this month. An additional cumulative gain of $2.5 million is earned by month 12. According to the last row in table 6, the CAAR over the twelve months after the offer announcement is 0.62 per cent, with a Z-value of 2.28. A non-parametric test on $P0$, however, rejects the hypothesis that this post-announcement average abnormal return is signficantly positive. Notice also that the average market value of total equity in month −12 is $55.4 million in the sample of 1,683 bidders, which is almost identical to the average value of $50.0 million for the targets in table 5. Perhaps as a result, the evidence presented here reveals a more even distribution of the merger gains between the merging firms, both in percentage terms and in terms of dollar values, than is typically the case in U.S.-based studies.

Of the 1,683 mergers underlying table 6, a substantial portion represent multiple acquisitions by relatively active acquirors. Furthermore, it is not uncommon for these active acquirors to merge with two or more target firms within a twelve-month period, thus causing the problem of partially overlapping event periods across acquisitions by a given bidder firm. If bidder B acquires target T_2 six months after having acquired target T_1, the wealth impact of the two acquisitions will, given my empirical methodology, show up in the abnormal returns to B in months 0 and 6 relative to the first merger and months −6 and 0 relative to the second merger. If the wealth effect of B's merger activity is typcially positive, including both acquisitions in the sample will cause the sample average abnormal return to overstate the true gain from merger activity. The evidence in table 7, which excludes multiple mergers by any given bidder within a twelve-month period, indicates that the levels of CAAR reported in table 6 are indeed somewhat overstated. The 1,138 mergers remaining in the sample are still associated with significantly positive average abnormal returns to bidder firms. However, the CAAR over the −12 through 12

TABLE 6

Per cent average abnormal return (AAR) and cumulative average abnormal return (CAAR) to 1,683 bidder firms relative to the merger announcement (month 0)
Total sample, 1964–83

Event month	Firms in average	AAR (%)	Z(AAR)	$P0$ (%)	CAAR (%)	Z(CAAR)	AAR ($m)	CAAR ($m)
−12	1156	−0.48	−0.99	45.2	−0.48	−0.99	2.38	2.38
−11	1156	0.17	1.87	47.0	−0.31	0.62	−1.77	0.61
−10	1153	0.75	3.37	49.9	0.44	2.45	0.60	1.21
−9	1152	0.34	2.54	47.5	0.78	3.39	1.50	2.70
−8	1154	−0.43	−0.95	45.5	0.35	2.61	−0.15	2.55
−7	1152	−0.10	0.27	45.5	0.25	2.49	0.62	3.18
−6	1150	0.16	1.74	45.4	0.41	2.96	0.49	3.66
−5	1149	0.53	1.68	47.0	0.94	3.37	0.50	4.16
−4	1147	0.58	3.12	48.8	1.52	4.21	1.45	5.62
−3	1145	0.52	1.29	46.2	2.04	4.41	−0.73	4.89
−2	1507	0.60	2.54	48.4	2.64	4.97	0.46	5.35
−1	1514	0.50	2.40	49.2	3.14	5.45	0.80	6.14
0	1520	1.17	4.56	52.1	4.31	6.50	0.29	6.43
1	1525	0.01	0.62	47.0	4.31	6.43	−0.43	6.00
2	1525	0.16	1.16	46.6	4.47	6.51	1.77	7.77
3	1329	0.18	0.63	47.3	4.65	6.46	0.32	8.09
4	1335	0.72	3.39	50.6	5.37	7.09	0.68	8.78
5	1343	−0.20	0.11	45.8	5.17	6.92	1.94	10.72
6	1349	−0.35	−1.08	45.7	4.82	6.48	−0.62	10.10
7	1354	0.08	0.83	46.2	4.91	6.50	−0.43	9.67
8	1361	0.55	2.51	48.8	5.46	6.90	−0.65	9.03
9	1364	−0.38	−1.32	46.0	5.07	6.46	−0.05	8.98
10	1367	−0.35	−0.48	45.1	4.72	6.21	−3.40	5.57
11	1374	−0.44	−0.67	48.0	4.28	5.95	0.43	6.00
12	1375	0.64	2.21	49.2	4.92	6.27	−0.35	5.66
[−12, 0]				51.2	4.31	6.50		6.43
[−12, −6]				46.1	0.41	2.96		3.66
[−5, −1]				49.3	2.73	4.94		2.48
[−3, 0]				48.2	2.79	5.40		0.82
[−2, 0]				50.7	2.26	5.48		1.54
[−1, 0]				52.3	1.66	4.92		1.09
[1, 3]				45.4	0.35	1.39		1.66
[1, 6]				44.4	0.52	1.97		3.67
[1, 12]				43.4	0.62	2.28		−0.78

NOTE AAR, Z(AAR), CAAR and Z(CAAR) are defined in equations (3)–(6). The dollar values of AAR and CAAR are found by multiplying each individual firm's abnormal return by the market value of total equity in month −12. In this sample, the average market value of total equity in month −12 is $55.4 million. $P0$ is the per cent of the sample with positive abnormal return.

period is 1.69 per cent (Z-value of 2.93) down from 4.92 per cent in the total sample. The abnormal return over month zero is 0.76 per cent (down from 1.17) with a Z-value of 2.95. The per cent of the sample with positive abnormal returns is virtually unchanged at 52.1 per cent for the month of the merger

TABLE 7

Per cent average abnormal return (AAR) and cumulative average abnormal return (CAAR) to 1,138 bidder firms relative to the merger announcement (month 0), excluding multiple mergers by a given bidder within a twelve-month period. 1963–83

Event month	Firms in average	AAR (%)	Z(AAR)	$P0$ (%)	CAAR (%)	Z(CAAR)	AAR ($m)	CAAR ($m)
−12	788	−0.63	−1.49	45.9	−0.63	−1.49	1.80	1.80
−11	788	0.02	1.15	46.8	−0.61	−0.24	−0.70	1.10
−10	787	0.49	1.62	48.5	−0.12	0.74	−0.29	0.81
−9	786	−0.07	0.73	46.9	−0.19	1.00	1.70	2.51
−8	787	−1.06	−2.99	43.5	−1.25	−0.44	−2.57	−0.06
−7	786	−0.12	0.24	45.5	−1.37	−0.30	1.02	0.96
−6	784	−0.32	−0.38	45.0	−1.69	−0.42	0.05	1.01
−5	783	0.41	0.93	45.7	−1.28	−0.07	0.24	1.25
−4	782	0.29	1.82	48.5	−0.98	0.54	1.64	2.90
−3	781	0.16	−0.03	44.8	−0.82	0.50	−0.60	2.29
−2	1009	0.38	1.40	47.1	−0.44	0.90	0.99	3.29
−1	1010	0.38	2.06	50.2	−0.06	1.46	−0.36	2.92
0	1013	0.76	2.95	52.1	0.70	2.22	0.93	3.85
1	1016	−0.11	0.50	46.7	0.59	2.27	1.18	5.03
2	1016	0.18	1.02	46.4	0.76	2.46	3.06	8.09
3	854	0.56	1.18	48.8	1.32	2.68	0.54	8.63
4	859	0.89	2.92	51.0	2.21	3.30	1.46	10.09
5	866	−0.60	−1.50	44.8	1.60	2.86	−0.33	9.76
6	871	−0.53	−1.58	44.1	1.08	2.42	−0.76	9.00
7	876	0.40	1.42	47.8	1.47	2.67	−0.62	8.38
8	880	0.72	2.18	49.1	2.19	3.09	−1.20	7.18
9	884	−0.25	−0.47	46.2	1.95	2.91	1.10	8.28
10	886	−0.16	0.37	45.9	1.79	2.93	−0.47	7.81
11	890	−0.37	−0.11	47.6	1.42	2.84	−0.64	7.17
12	891	0.27	0.70	47.8	1.69	2.93	−0.81	6.36
[−12, 0]				47.3	0.70	2.22		3.85
[−12, −6]				43.9	−1.69	−0.42		1.01
[−5, −1]				48.6	1.63	2.76		1.91
[−3, 0]				48.4	1.68	3.19		0.96
[−2, 0]				50.1	1.52	3.70		1.56
[−1, 0]				52.0	1.14	3.54		0.57
[1, 3]				46.1	0.62	1.56		4.78
[1, 6]				42.1	0.38	1.04		5.14
[1, 12]				43.4	1.00	1.91		2.51

NOTE AAR, Z(AAR), CAAR and Z(CAAR) are defined in equations (3)–(6). The dollar values of AAR and CAAR are found by multiplying each individual firm's abnormal return by the market value of total equity in month −12. In this sample, the average market value of total equity in month −12 is $56.9 million. $P0$ is the per cent of the sample with positive abnormal return.

announcement. Note that the reduction in the CAAR is consistent with the proposition that the mergers excluded from table 7 on average earn positive abnormal returns. Thus, the results reported in table 7 probably represent a somewhat conservative estimate of the true gains to Canadian bidder firms.

Finally, the source of the merger announcements reported in the *Merger Register* warrant some attention. As indicated in the footnote to table 1, of the 1,930 mergers in the total data base 769 were first announced in the *Globe and Mail*, 437 in the *Montreal Gazette*, 86 in the *Financial Post*, 63 in the *Financial Times*, and 21 in the *Vancouver Sun*, while the announcements of the remaining 554 cases are distributed across more than fifty other newspapers and trade journals. Abnormal stock returns measure only the *unanticipated* component of the total wealth effect of the merger, and one implicit assumption in the above analysis is that the 'news content' of any particular merger announcement (i.e., the degree to which the newspaper article announcing the merger causes the market to revise its estimate of the probability that the merger will in fact take place) is independent of the newspaper in which the article appears. It is, however, reasonable to expect that the news of a merger becomes 'publicly available' (and therefore reflected in security prices) more rapidly the larger the circulation of the newspaper source. For example, this is one of the main reasons why virtually all merger studies based on U.S. data restrict the sample to mergers announced in the *Wall Street Journal*, the major U.S. financial newspaper.

With this in mind, I repeated the above analysis using cases announced in the *Globe and Mail* only. Of the 413 cases in table 5 (target firms) 180 were announced in this newspaper. As it turned out, the CAAR to these 180 targets is 10.29 per cent over the period −12 through 0 (*Z*-value of 4.00), which is almost identical to the 10.02 per cent reported in table 5 for the same event period. Furthermore, of the 1,683 cases in table 6, 643 were announced in the *Globe and Mail*. The CAAR to these 643 bidders is 3.11 per cent over the −12,0 period (*Z*-value of 3.79, 53 per cent positive), which is close to the 4.31 per cent reported in table 6 for the total sample. Thus, the argument that a merger announcement that appears in the *Globe and Mail* represents more of a 'surprise event' than a merger announcement in the other newspaper sources in the total data base is not supported. Note also that 464 of the 643 mergers announced in the *Globe and Mail* remain after excluding mutiple mergers by a given bidder within a twelve-month period. The CAAR to this restricted sample is 2.17 per cent over the −12,0 period (*Z*-value of 2.37), up from the 0.70 per cent reported in table 7 for the larger data base. This gives support to the above suggestion that the results in table 7 indeed represent a conservative estimate of the true gains to Canadian bidder firms.

Horizontal versus non-horizontal mergers

If the previously documented gains to bidder and target firms indeed reflect synergistic gains from combining the two firms productive resources, then one would intuitively expect horizontal mergers to be more profitable than non-horizontal mergers. By definition, a horizontal merger involves two firms operating in overlapping product markets, with the resulting extensive

knowledge of what it takes to realize efficiency gains through the corporate combination. The evidence in figure 2 and table 8 sheds some light on this question, based on the total sample of classifiable four-digit SIC horizontal and non-horizontal cases in the data base. Note that the evidence in table 8 is not sensitive to the inclusion of multiple mergers by frequent acquirors in the sample; thus only the total sample results are reported.

The results do not indicate that firms involved in horizontal mergers perform significantly better than firms in non-horizontal mergers. The 77 target firms in horizontal mergers earn CAAR of 15.26 per cent over the $-12,0$ period (Z-value of 3.01), 3.65 per cent over month 0 (Z-value of 1.92) and 2.56 per cent over the post-announcement period 1,12 (Z-value of 0.12). The corresponding performance of the 139 targets in non-horizontal mergers is 11.09 per cent ($Z = 4.32$), 2.84 per cent ($Z = 4.03$) and -2.38 per cent ($Z = -0.20$), respectively. In none of the reported sub-periods in table 8 do horizontal targets outperform non-horizontal targets on a 10 per cent level of significance. Furthermore, the 215 bidder firms in horizontal mergers earn CAAR of 2.84 per cent ($Z = 0.92$) over the $-12,0$ period, 0.89 per cent ($Z = 1.97$) over month 0, and 0.60 per cent ($Z = 0.71$) over the 1,12 period.

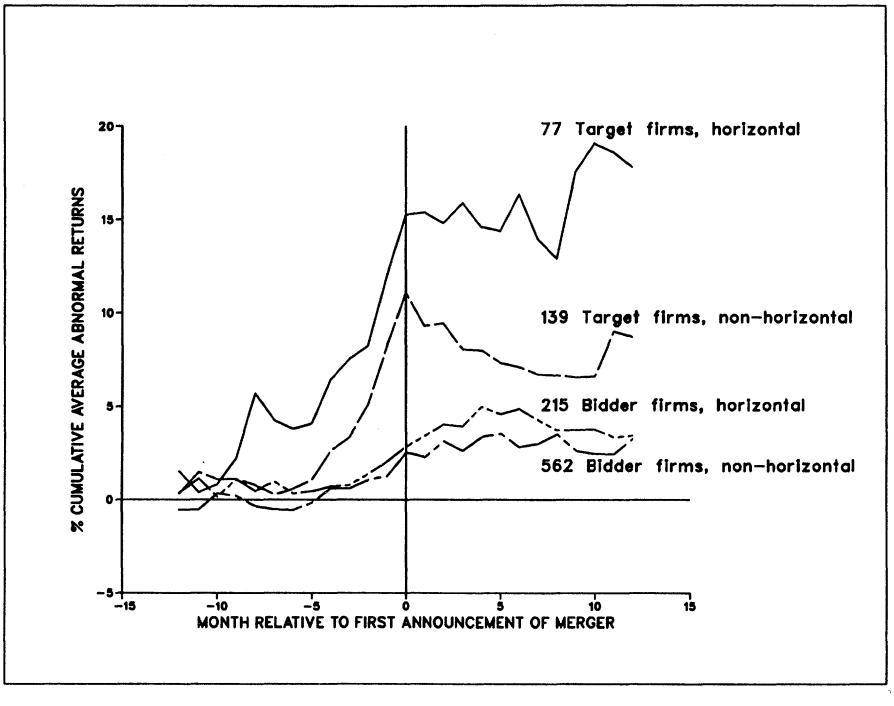

FIGURE 2 Monthly cumulative average abnormal returns relative to the merger announcement; four-digit SIC horizontal versus non-horizontal mergers, 1964–83

TABLE 8

Per cent cumulative average abnormal return (CAAR) to bidder and target firms relative to the merger announcement
Total sample of four-digit SIC horizontal vs. non-horizontal cases, 1964–83

1964–83 Merger sample	Sample size	Summary statistic[a]	Months relative to the month of the merger announcement (month 0) [−12,0]	[−12,−6]	[−5,−1]	[−3,0]	[−2,0]	[−1,0]	[0,0]	[1,3]	[1,6]	[1,12]	[−12,12]
I Target firms													
		CAAR(%)	15.26	3.80	8.16	9.18	8.04	7.34	3.65	0.65	1.10	2.56	17.82
Four-digit SIC	77	(Z)	(3.01)	(0.78)	(3.23)	(3.55)	(3.63)	(4.30)	(1.92)	(0.22)	(0.30)	(0.12)	(2.09)
horizontal		CAAR($m)	10.4	6.7	17.4	10.1	9.2	10.6	1.1	0.6	9.8	10.2	11.2
		CAAR(%)	11.09	0.57	7.68	8.46	7.74	5.97	2.84	−3.03	−3.98	−2.38	8.71
Four-digit SIC	139	(Z)	(4.32)	(0.53)	(4.54)	(5.71)	(5.90)	(5.36)	(4.03)	(−1.23)	(−1.34)	(−0.20)	(2.97)
non-horizontal		CAAR($m)	9.9	3.4	6.9	4.6	3.9	0.2	0.8	0.2	−0.3	0.9	10.8
II Bidder firms													
		CAAR(%)	2.84	0.32	1.72	2.22	2.16	1.54	0.89	1.09	2.02	0.60	3.53
Four-digit SIC	215	(Z)	(0.92)	(0.14)	(0.84)	(1.53)	(1.87)	(1.91)	(1.97)	(0.64)	(1.14)	(0.71)	(1.18)
horizontal		CAAR($m)	1.0	−1.5	0.8	2.3	3.1	3.7	1.6	−2.6	−1.2	−9.8	−8.9
		CAAR(%)	2.52	−0.55	1.80	1.93	1.92	1.47	1.27	0.10	0.29	0.74	3.26
Four-digit SIC	562	(Z)	(2.21)	(0.19)	(2.20)	(2.68)	(3.07)	(2.87)	(2.55)	(1.23)	(1.69)	(2.31)	(3.19)
non-horizontal		CAAR($m)	12.4	7.9	4.3	2.0	2.2	1.5	1.0	4.2	8.4	3.1	15.4

a CAAR and Z(CAAR) are defined in equations (4) and (6) in the text. The dollar value of CAAR is found by multiplying each individual firm's abnormal return by the market value of total equity in month −12. Note that restricting the sample to cases with strictly non-overlapping event periods for a given bidder firm does not materially affect the levels of CAAR or the significance levels reported in this table.

The corresponding performance of non-horizontal bidders is very similar, and both categories of firms end up with CAAR of approximately 3 per cent by month 12. These results indicate that being closely related in product markets is not a necessary condition for bidder or target firms to gain from merger activity in Canada.

Ontario versus the western provinces

As mentioned in the introduction, Canadian provinces differ both with respect to their regulation of securities markets and in their industrial base. To gauge the sensitivity of the earlier conclusions to the home province of the bidder firm, table 9 shows the abnormal performance of bidder and target firms when the bidder is located in Ontario and the western provinces (British Columbia, Alberta, Manitoba, and Saskatchewan), respectively. There is no detectable difference between the performance of target firms receiving bids from firms located in the two alternative geographical regions. For example, the CAAR to the 73 targets receiving bids from Ontario-based firms earn 15.13 per cent (Z-value of 3.50) over the thirteen months preceding and including the announcement month, while the corresponding performance of targets of western bidders is 17.72 per cent ($Z = 2.33$). In none of the reported event periods is there a statistical difference (on a 10 per cent level) between the performance of the two samples.

In contrast, there is some evidence that bidder firms located in the west outperform bidder firms that have Ontario as the home province. This is true whether one focuses on the total sample or the sample that excludes mergers by a given acquiring firm within overlapping event periods. The latter sample is also included in table 9, since the abnormal returns to the sample of Ontario-based bidders appear to be somewhat sensitive to the exclusion of multiple acquisitions by frequent acquirors. In the 'total' sample, bidders located in Ontario earn CAAR of 2.89 per cent ($Z = 2.72$) over the $-12,0$ period, while bidders in the west earn CAAR of 10.99 per cent ($Z = 2.93$) over the same event period. Using the 'restricted' sample, the corresponding numbers are -2.01 per cent ($Z = -0.75$) and 12.13 per cent ($Z = 2.43$). Thus, according to the 'total' sample, bidder firms in both geographical regions earn significantly positive abnormal returns, and one cannot reject the hypothesis that the two groups of bidders show identical performance. According to the 'restricted' sample, however, bidders in Ontario earn statistically insignificant abnormal returns over the $-12,0$ period, while bidders in the west continue to show positive performance over this interval. A standard t-test rejects on a 10 per cent level the hypothesis that bidders in Ontario and the west in fact earn CAAR of identical magnitudes in this sample. In month 0, both the 'total' and the 'restricted' sample show significantly positive CAAR to bidders in both Ontario and in the west, and neither sample is statistically different from the other. Finally, over the post-announcement period 1,12 both the 'total' and the 'restricted' samples indicate on a 1 per cent level of significance that bidders in

TABLE 9

Per cent cumulative average abnormal returns (CAAR) to bidder and target firms relative to the merger announcement
Total sample classified by the home province of the bidder firm, 1964–83

1964–83 Merger sample	Sample size	Summary statistic[a]	Months relative to the month of the merger announcement (month 0) [−12,0]	[−12,−6]	[−5,−1]	[−3,0]	[−2,0]	[−1,0]	[0,0]	[1,3]	[1,6]	[1,12]	[−12,12]
I Target firms													
		CAAR(%)	15.13	4.33	6.28	9.06	6.87	8.90	4.52	−2.82	−3.83	0.50	15.64
Ontario	73	(Z)	(3.50)	(1.12)	(2.54)	(3.92)	(3.38)	(5.21)	(3.99)	(−1.80)	(−1.58)	(−0.57)	(2.13)
		CAAR($m)	16.7	4.4	10.7	8.8	7.2	6.2	1.6	−2.6	2.4	6.7	23.4
		CAAR(%)	17.72	7.04	10.67	5.51	7.38	5.64	2.26	−1.42	−1.95	−8.64	6.82
Western	19	(Z)	(2.33)	(0.88)	(2.58)	(1.89)	(2.19)	(2.37)	(0.49)	(−0.60)	(−0.84)	(−1.16)	(0.71)
provinces		CAAR($m)	28.1	20.1	28.3	30.8	32.2	36.4	0.9	19.5	12.9	10.1	25.2
II Bidder firms, total sample													
		CAAR(%)	2.89	0.30	1.83	1.44	1.12	0.72	0.75	−0.92	−0.19	−0.75	2.13
Ontario	506	(Z)	(2.72)	(1.43)	(1.72)	(1.81)	(2.15)	(1.41)	(2.21)	(−0.41)	(0.62)	(0.08)	(2.02)
		CAAR($m)	1.0	−1.0	−1.5	−2.0	−1.0	−0.8	−1.0	−0.5	1.0	−2.5	−1.5
		CAAR(%)	10.99	2.05	6.96	5.05	4.72	2.75	2.14	1.63	6.45	17.53	28.7
Western	107	(Z)	(2.93)	(0.68)	(2.79)	(2.86)	(3.22)	(2.58)	(2.67)	(1.08)	(2.55)	(4.82)	(5.48)
provinces		CAAR($m)	14.9	0.6	11.2	10.1	10.3	5.4	2.9	0.7	6.8	11.7	26.6
III Bidder firms, non-overlapping event periods only[b]													
		CAAR(%)	−2.01	−3.63	1.03	0.99	0.76	0.78	0.59	−0.92	−0.13	−0.23	−2.24
Ontario	341	(Z)	(−0.75)	(−1.87)	(0.28)	(0.86)	(1.60)	(1.50)	(1.67)	(−0.25)	(0.31)	(0.26)	(−0.36)
		CAAR($m)	−7.3	−2.7	−3.0	−3.8	−4.0	−1.0	−1.6	−1.7	0.2	0.0	−7.2
		CAAR(%)	12.13	4.84	5.45	4.90	4.76	2.79	1.83	0.86	5.44	17.05	29.18
Western	71	(Z)	(2.43)	(1.15)	(1.60)	(2.28)	(2.60)	(2.30)	(2.17)	(0.40)	(1.58)	(3.43)	(4.13)
provinces		CAAR($m)	13.4	2.4	6.9	5.2	8.1	3.7	4.2	1.6	6.9	17.0	30.4

a CAAR and Z(CAAR) are defined in equations (4) and (6) in the text. The dollar value of CAAR is found by multiplying each individual firm's abnormal return by the market value of total equity in month −12.

b This sample excludes multiple mergers by a given bidder within a twelve-month period.

the west perform better than their counterparts in Ontario. The CAAR to western bidder firms continues to rise, somewhat curiously, by 17 per cent over the year following the merger announcement. The superior performance of western based bidder firms possibly reflects relatively large opportunities for synergistic gains in the resource-based economies of the west, a potent topic for future research.

CONCLUSION

The market for corporate control serves a useful social function by lowering the transaction costs of reallocating corporate resources towards their most efficient use. The threat of a takeover has the effect of inducing wealth-maximizing behaviour by incumbent management teams, which in turn implies that the separation of ownership and control observed in large, publicly held corporations can survive as a viable organizational form. While corporate takeovers generate substantial public interest owing, perhaps, to the large amounts of money involved in the transactions, little is known as to the economic performance of Canadian mergers. This paper presents some first systematic evidence on the valuation effects of Canadian mergers and acquisition based on more than 1,900 cases that took place over the twenty-year period 1964 through 1983.

The main empirical results can be summarized as follows: First, target *and* bidder firms listed on the TSE on average earn large and significant gains from takeover activity. This finding contrasts with the bulk of the evidence reported in U.S. studies, which typically fail to document significant economic rents to bidder firms. Second, the merger gains do not differ significantly across horizontal and non-horizontal mergers, where the definition of horizontal is based on overlapping four-digit SIC codes. Third, bidder firms located in the western provinces outperform bidder firms located in Ontario. The geographical location of the bidder does not seem to be a determinant of the gains to the target.

Several important issues remain unanswered. For example, do the gains from horizontal mergers reflect discounted monopoly / monopsony rents or the present value of future cost savings made possible by the merger? What are the economic effects of the different takeover regulations across the various provinces? What has been the effect of the Foreign Investment Review Agency on the performance of bidder and target firms in particular and on the Canadian market for corporate control in general? These and related questions are currently being researched within the framework of the comprehensive data base underlying this paper.[17]

17 Eckbo (1986) presents evidence rejecting the hypothesis that the enforcement activity of FIRA has significantly affected the abnormal returns to U.S. bidder firms from acquiring Canadian targets.

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