

Earnings signals in fixed-price and Dutch auction self-tender offers¹

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Abstract

Studies by Vermaelen (1981) and others indicate that the positive excess stock returns around self-tender offer announcements are the result of a signal of future earnings improvements. Comment and Jarrell (1991), Lee, Mikkelson and Partch (1992) and Persons (1994) argue that the signal in fixed-price self-tender offers should be stronger than the signal in Dutch auction self-tender offers. This study tests whether the earnings improvement following fixed-price self-tender offers is greater than that following Dutch auction self-tender offers. We find some evidence that earnings improve following both types of self-tender offers. However, we find no difference in earnings improvement between the two types of offers. © 1998 Elsevier Science S.A. All rights reserved.

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1. Introduction

Empirical investigations by Dann (1981), Masulis (1980), Vermaelen (1981), Comment and Jarrell (1991), and Howe et al. (1992) document that corporate self-tender offers are associated with statistically and economically significant

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announcement-period excess stock returns. Dann et al. (1991), Hertz and Jain (1991), and Vermaelen (1981) report that earnings improve following self-tender offers and that the earnings improvement is correlated with the announcement-period excess stock returns. Based on this evidence, one widely (though not universally) accepted explanation for the excess returns that accompany corporate self-tender offers is that the announcement of the tender offer 'signals' management's expectations of improved future earnings performance for the firm (Comment and Jarrell, 1991 and Weston and Copeland, 1992).

The studies of the relationship between earnings and excess returns used samples of fixed-price self-tender offers from the 1960s and 1970s.² Dutch auction self-tender offers were introduced in 1981. Comment and Jarrell (1991), Lee et al. (1992), and Persons (1994) argue that the signal associated with fixed-price self-tender offers is likely to be stronger than the signal associated with Dutch auction self-tender offers. The proposition that self-tender offers signal managers' expectations for improved future earnings, implies that the earnings improvement associated with fixed-price self-tender offers should be stronger than that associated with Dutch auction self-tender offers. A primary purpose of this study is to investigate that question empirically. Because our study encompasses the 1980s and the first half of the 1990s, an important by-product of our investigation is a determination of whether the earnings improvements associated with self-tender offers during the 1960s and 1970s persisted during the more recent decades.

To conduct this study, we evaluate earnings improvements from before to after the self-tender offers against three different benchmarks, which are described in Section 4. With none of these benchmarks do we find any differences in earnings improvement between the two types of self-tender offers. Indeed, with two of the three benchmarks, we find no improvement in earnings for either type of self-tender offer. There is, however, more to the story. According to the data, relative to own-industry benchmarks, both firms that undertake fixed-price self-tender offers and those that undertake Dutch auction self-tender offers have superior earnings performance prior to self-tender offers. On average, over the five years prior to the self-tender offers, the rate of return on assets for these firms exceeds their industry medians by 2% to 5% per year. Furthermore, this superior performance continues for several years afterward. On this basis, there is no improvement in earnings following self-tender offers. So where is the earnings signal?

Of the three earnings benchmarks, the one that does indicate an improvement in earnings is based on a procedure proposed by Barber and Lyon (1996). Barber and Lyon observe that corporate earnings tend to follow a mean

² To be precise, however, Hertz and Jain (1991) include the first four years of the 1980s in their sample and may have included a few Dutch auction self-tender offers.

reverting process in which the earnings of firms with above or below normal earnings revert over time to their industry norm. When we construct a benchmark of firms with similar pre-announcement performance as the tender-offer firms using the procedure proposed by Barber and Lyon, we find that the benchmark does exhibit reversion toward the industry median during the announcement year, whereas firms that undertake self-tender offers do not. Thus, to the extent that there is an earnings signal in self-tender offer announcements during the period 1981–1994, it is that the above average earnings of the firms conducting the offers will continue to be above average longer than might otherwise have been expected, but even on this basis, the difference in earnings ‘improvement’ between fixed-price and Dutch auction self-tender offers is not significant.

A related question is whether the market interprets fixed-price self-tender offers as providing a stronger signal of future earnings than Dutch auction self-tender offers. If so, market participants should adjust their expectations of future earnings upwards to a greater extent in response to announcements of fixed-price than Dutch auction self-tender offers. To investigate that question, we use Value Line forecasts as a proxy for the market’s expectations of future earnings. We compare Value Line forecasts before the announcement with Value Line forecasts afterward. We find no difference in the revisions in Value Line earnings forecasts from before to after the announcement between the two types of self-tender offers. In fact, there is only modest evidence of improvement in earnings forecasts for either type of self-tender offer.

In sum, for both types of self-tender offers, the firms conducting the tender offers had superior performance (as measured by operating earnings) prior to the tender offer, and this superior performance continued after the offers for a longer time period than might have been expected in the absence of the tender offers. On this basis, both firms that conducted fixed-price self-tender offers and those that conducted Dutch auction self-tender offers during the 1980s and early 1990s exhibited higher than expected earnings following the tender offers, but there was no difference on this dimension between the two sets of firms. While it is possible that the signal provided by self-tender offers represents some factor that does not show up in operating earnings, earnings are a broad-based measure of performance and should capture the effects of any fundamental changes in the operations of the firms that lead to an increase in value. If there is a difference in the signal provided by fixed-price and Dutch auction self-tender offers, the challenge is to identify the source of this difference and to discover why it does not show up more strongly as a difference in earnings improvement between the two types of self-tender offers.

Our investigation incidentally supports Barber and Lyon’s (1996) contention that when sample firms experience abnormal pre-event performance, matching procedures that ignore the pre-event performance may yield misspecified test statistics. While the results presented here for self-tender offers do not indicate

which procedure is optimal, both the simulation results in Barber and Lyon and our results suggest that researchers should carefully select the benchmark against which they compare performance.

Section 2 reviews prior empirical and theoretical studies of self-tender offers. Section 3 describes the procedure used to compile our sample and provides summary statistics on the companies and self-tender offers in the sample. Section 4 presents our primary analysis of earnings and Section 5 presents sensitivity analysis. Section 6 provides a numerical example of the effect of earnings changes on equity value. Section 7 concludes.

2. Prior studies of self-tender offers

Empirical investigations of fixed-price self-tender offers undertaken with samples from the 1960s and 1970s document that announcements of corporate self-tender offers are associated with announcement-period excess stock returns of 16% to 17% (Dann, 1981; Masulis, 1980; and Vermaelen, 1981). Studies undertaken with samples from the 1980s document excess returns of approximately 8% (Comment and Jarrell, 1991; and Howe et al., 1992). Thus, although the announcement-period excess stock returns are somewhat diminished in the 1980s relative to prior decades, they are still statistically significant and economically substantial.

One interpretation of the excess returns surrounding self-tender offers is that the offers provide a signal about the future prospects of the firm. For example, Dann (1981) concludes that "...overall, the results are consistent with the hypothesis that repurchase tender offer announcements constitute a revelation by management of favorable new information about the value of the firm's future prospects" (p. 136). A specific interpretation is that they provide a positive signal about the future earnings of the firm. Evidence to support this position has been presented by Vermaelen (1981), Dann et al. (1991), and Hertz and Jain (1991). Vermaelen's sample encompasses the period 1962–1977. He compares post-tender-offer realized earnings with expected earnings where expected earnings are an extrapolation of historical realized earnings. He concludes that "...firms offer to repurchase part of their shares at a premium when they have positive information about future earnings" (p. 179). Dann et al. investigate a sample of self-tender offers that took place over the period 1969 through 1978. They also compare realized earnings with expected earnings. They compute expected earnings in two ways, one of which is based on historical earnings, the other of which is based on historical earnings plus an industry adjustment. They report that earnings improve (relative to either benchmark) following self-tender offers and that this improvement is positively correlated with announcement-period excess stock returns. Like Vermaelen, they conclude that self-tender offer announcements convey positive information about future earnings.

If tender offers do signal improved future earnings, rational investors should revise upward their expectations of future earnings when self-tender offers are announced. Hertz and Jain (1991) investigate that question by using Value Line forecasts as a proxy for the market's earnings expectations. Specifically, for a sample of self-tender offers that took place between 1970 and 1984, they use pre-announcement Value Line forecasts as a proxy for the market's pre-announcement expected earnings and post-announcement Value Line forecasts as a proxy for the market's post-announcement expected earnings. They find positive revisions of the Value Line earnings forecasts around self-tender offer announcements, and these revisions are positively correlated with announcement-period excess stock returns.

Since their introduction in 1981, Dutch auction self-tender offers have become increasingly popular (Comment and Jarrell, 1991). In a fixed-price self-tender offer, managers specify a single price at which shareholders can tender. In a Dutch auction self-tender offer, managers specify a range of prices within which shareholders can tender and the responses to the self-tender offer determine the price that will be paid to tendering shareholders. Comment and Jarrell (1991) argue that fixed-price self-tender offers provide a more effective signaling mechanism than do Dutch auction self-tender offers because informed managers set the premium in fixed-price offers, whereas shareholders determine the premium to be paid in Dutch auction self-tender offers. Furthermore, Dutch auction self-tender offers in which managers set a relatively low minimum premium should not be as convincing a signal since their potential wealth loss in the event of 'false signaling' is minimal. Finally, because the minimum premiums offered in Dutch auction self-tender offers are substantially lower than those in fixed-price self-tender offers, they argue that Dutch auction self-tender offers provide weaker signals than do fixed-price self-tender offers. After revising their sample to exclude events with contaminating information, Comment and Jarrell measure excess stock returns over the seven-day period surrounding the self-tender offer announcements. They report that the average excess stock return of 11% measured over the seven-day interval surrounding the announcements for their sample of fixed-price self-tender offers is significantly greater than the average excess return of 8% for their sample of Dutch auction self-tender offers. They interpret this finding (along with the results of other tests) to indicate that fixed-price self-tender offers are a more effective signaling mechanism than are Dutch auction self-tender offers.

Persons (1994) constructs a more formal theoretical model in which firms can choose between fixed-price and Dutch auction self-tender offers. In his model, the firm faces an uncertain upward-sloping supply curve and only the manager knows the true value of the firm. The manager can signal to the market that the true value is high by repurchasing shares at a premium. Persons' model predicts that fixed-price self-tender offers are a more effective signaling mechanism than are Dutch auction self-tender offers.

Consistent with the idea that fixed-price self-tender offers provide more informative signals than do Dutch auction self-tender offers, Lee et al. (1992), using a sample from 1977 through 1988, report that managers increase their purchases and decrease their sales of the firm's shares prior to fixed-price tender offers, but managers' buying and selling of the firm's shares is normal prior to Dutch auction tender offers.

Comment and Jarrell, Persons, and Lee et al. suggest that the signal (regardless of what the information is that is being signaled) is stronger for fixed-price than for Dutch auction self-tender offers. None of their studies specifically ties the signal to earnings. However, as we noted, earnings is a broad-based measure of performance, and studies undertaken with samples from the 1960s and 1970s have documented that earnings increase following fixed-price self-tender offers and that the improvement is correlated with announcement-period stock returns. It is this line of reasoning that underlies our investigation of whether the earnings improvement is greater following fixed-price than following Dutch auction self-tender offers. Because the first Dutch auction self-tender offer took place in 1981, our study necessarily covers a later time period than that of prior studies. Thus, a further contribution of this investigation is to update the studies of Vermaelen, Dann et al. and Hertz and Jain.³

3. Sample construction and description

Our sample covers the period September 1981, the month in which the first Dutch auction self-tender offer was announced, through December 1994. Five sources are used to construct an initial sample of self-tender offers: (1) official corporate announcements in the Wall Street Journal (*WSJ*); (2) the 'reacquired shares' section of the Wall Street Journal Index (*WSJI*); (3) the Dow Jones News Retrieval (*DJNR*) service; (4) Comment and Jarrell (1991); and (5) a list of self-tender offers used in Lee et al.⁴ Self-tender offers are excluded if they were (1) open only for preferred or special common stock; (2) open only to holders of odd lots; (3) part of a merger, liquidation, or going private transaction; or (4) conducted by a closed-end investment company.

The empirical analysis includes two primary investigations. The first deals with changes in earnings from before to after the tender offers. The second deals with changes in Value Line forecasts of earnings. To be included in the earnings

³ Additional motivation for tests of whether earnings improve following self-tender offers comes from studies of seasoned equity (Loughran and Ritter, 1996) and initial public equity offers (Jain and Kini, 1994), which document that earnings tend to decline following equity offerings.

⁴ We thank Wayne Mikkelsen for providing us with this list.

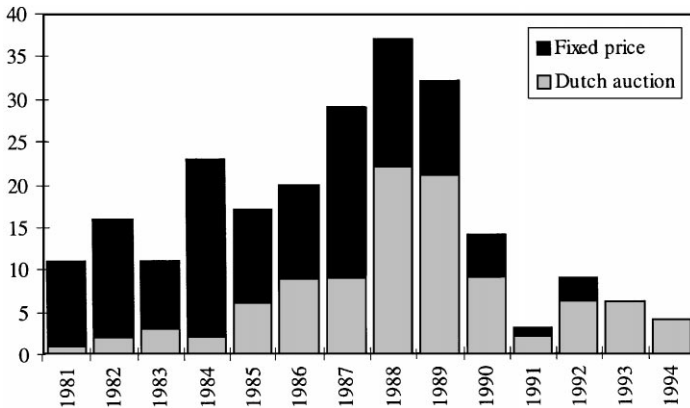


Fig. 1. Frequency of fixed-price and Dutch auction self-tender offers. Year-by-year frequency distribution of announcements of 130 fixed-price and 102 Dutch auction self-tender offers for the period September 1981 through December 1994.

analysis, operating income and the book value of assets of the company must be available in either Compustat or Moody's Manuals for at least two years before and two years after the year of the self-tender offer. To be included in the Value Line analysis, earnings forecasts for the company must be available in Value Line both before and after the self-tender offer. Information on self-tender offers (e.g., the number of shares sought and the tender price) is obtained from the Offer to Purchase issued by the company and from reports in the WSJ or the DJNR service. CRSP daily returns are used to conduct event studies around self-tender offer announcement dates obtained from either the WSJ or the DJNR service. Announcement dates are available for every tender offer in the sample.

Fig. 1 shows that the sample includes at least three tender offers in each year of the sample period with some clustering of offers during the three-year interval 1987–1989. Furthermore, over the time period considered, the use of Dutch auction self-tender offers increased relative to the use of fixed-price self-tender offers. In the aggregate, the sample includes 232 self-tender offers by 213 different companies. The self-tender offers represent 54 different two-digit SIC codes. The 14 industries with six or more self-tender offers are given in panel A of Table 1. Neither the sample of fixed-price nor the sample of Dutch auction self-tender offers exhibits any pronounced industry clustering. Moreover, there is no evidence to indicate that the distribution across industry classifications differs systematically between the two types of self-tender offers. The subsample for the earnings analysis includes 116 fixed-price self-tender offers by 104 different companies and 91 Dutch auction self-tender offers by 84 different companies. The subsample used in the Value Line analysis includes 74

fixed-price self-tender offers by 69 companies and 79 Dutch auction self-tender offers by 74 companies.

Panel B of Table 1 provides summary statistics for the sample. The mean fraction of shares sought is 21.3% for fixed-price self-tender offers and 16.8% for Dutch auction self-tender offers, and the difference between the two is statistically significant (p -value = 0.01). Further, the mean (median) tender premium is 16.8% (15.7%) for fixed-price self-tender offers and 13.4% (12.2%) for Dutch auction self-tender offers, and the p -value for the difference between the two is 0.02. (The premium is measured as the tender price divided by the stock price five days prior to the tender offer announcement.) Thus, if the fraction of shares sought or the size of the premium offered is an indicator of the 'strength of the signal' conveyed by the self-tender offer, the signal should be stronger for fixed-price than for Dutch auction self-tender offers. As we noted, in Dutch auction tender offers, managers set a range for the tender price. The mean (median) of the minimum for this range is 1.6% (0.7%). Finally, the mean (median) value of equity for firms that conduct Dutch auction self-tender offers is more than twice (four times) as large as that of those firms that conduct fixed-price self-tender offers.

To begin, we calculate the cumulative excess returns (CERs) for the two samples using the traditional market model procedure (Linn and McConnell, 1983) with parameters estimated with returns from 250 days to 10 days before the tender offer announcement. For the three-day period surrounding the announcement (hereafter referred to as the announcement period), the mean (median) CER for fixed-price self-tender offers is 7.9% (6.8%) and for Dutch auction self-tender offers it is 7.7% (6.4%). We also calculate CERs over other intervals around the announcements for up to as many as ten days before through ten days after the announcements. In no case is the difference in the mean CERs between the two samples significant at the 0.10 level. The difference in median CERs is significant at the 0.05 level for the seven-day interval, but that is the only interval for which the difference in medians is significant at that level. If the excess returns around announcements of tender offers are the result of a signal emanating from the self-tender offer, and if that signal provides information about future earnings, the implication from the CERs is that self-tender offers continued to signal earnings improvements during the 1980s and 1990s, but that there is no difference between the two types of self-tender offers in terms of the earnings improvement signaled. We next investigate those questions.⁵

⁵ One of the virtues, at least from our perspective, of analyzing earnings is that the stock-price response to self-tender offers may reflect other benefits and costs associated with the self-tender offer, such as price pressure effects (Bagwell, 1992) and corporate control effects (Stulz, 1988).

Table 1
 Descriptive statistics of the sample of self-tender offers
 Descriptive statistics for a sample of 130 fixed-price and 102 Dutch auction self-tender offers for the period September 1981 through December 1994. The number of observations in Panel B varies somewhat depending on data availability.

SIC code Industry name		Fixed-price		Dutch auction		Total	
		Number	Percentage	Number	Percentage	Number	Percentage
2000	Food and kindred products	7	5.4	9	8.8	16	6.9
2800	Chemicals and allied products	5	3.8	10	9.8	15	6.5
6300	Insurance carriers	4	3.1	7	6.9	11	4.7
2200	Textile mill products	7	5.4	3	2.9	10	4.3
3500	Industrial, commercial machinery, computer eq.	6	4.6	4	3.9	10	4.3
6100	Nondepository credit institutions	6	4.6	3	2.9	9	3.9
3400	Fabricated metal, excluding machinery and trans.	6	4.6	3	2.9	9	3.9
3700	Transportation equipment	4	3.1	5	4.9	9	3.9
2300	Apparel and other finished products	6	4.6	2	2.0	8	3.4
3800	Measuring instruments, photo and watches	3	2.3	5	4.9	8	3.4
3600	Electrical equipment, excluding computers	3	2.3	4	3.9	7	3.0
8000	Health services	2	1.5	5	4.9	7	3.0
1300	Oil and gas extraction	4	3.1	2	2.0	6	2.6
7300	Business services	3	2.3	3	2.9	6	2.6
	Other	64	49.2	37	36.3	101	43.5

Panel B: Sample statistics		Fixed-price		Dutch auction		p-values for differences	
		Mean	Median	Mean	Median	Mean	Median
Fraction of shares sought		21.3%	17.4%	16.8%	14.6%	0.01	0.13
Tender offer premium		16.8%	15.7%	13.4%	12.2%	0.02	0.04
Market value of equity		\$747M	\$157M	\$1,708M	\$729M	0.00	0.00

4. Analysis of earnings

4.1. Procedure for analyzing changes in earnings

We measure earnings improvement as the difference between expected earnings and realized earnings. We use earnings before depreciation, interest and taxes (EBDIT) divided by the book value of assets, hereafter referred to as ROA, as our measure of earnings.

Three procedures are used to produce the expected ROA. With the first procedure, for each firm, we compare each year's ROA with the prior year's ROA. In this test, the prior year's ROA is a proxy for the current year's expected ROA. To implement this procedure, for each firm in the sample, EBDIT and total assets are extracted from either Compustat or the relevant Moody's Manual for up to five years before through five years after the year of the tender offer announcement. As we noted above, we require that such data be available for a minimum of two years before and two years after the year of the tender offer in order for the tender offer to be included in this analysis. Because our earnings and assets data end with 1995, the 13 self-tender offers that occurred in 1994 are not included in this analysis. Furthermore, for those self-tender offers in 1991 and later, the number of years for which data are available following the year of the tender offer is less than five. Thus, the number of tender offers in the analysis declines progressively as the analysis moves from year + 2 through year + 5 following the offer. As we noted above, for this analysis, the fixed-price sample includes 116 self-tender offers and the Dutch auction sample includes 91 self-tender offers. These samples are used with all three procedures. The mean (median) announcement-period CERs associated with these fixed-price and Dutch auction self-tender offers are 7.7% (6.7%) and 8.3% (6.9%), respectively, and the difference in means (medians) is not significant at the 0.10 level.

In our second procedure, we refine our proxy of expected earnings by adjusting last year's ROA for the change in the industry median ROA during the year. The industry median is computed as follows: for each firm in the sample, for the period beginning five years before and ending no later than five years after the tender offer, we identify every firm in Compustat with the same SIC code. For each of these peer group firms for which sufficient data are available, we calculate the annual ROA. For each year relative to the self-tender offer, the industry median ROA is determined. This median ROA is the industry benchmark against which the firms in our sample are compared. Specifically, we calculate the industry-adjusted ROA by subtracting the industry median ROA from the tender-offer firm's ROA in the same year.

Our third procedure is a refinement of the proxy of expected earnings proposed by Barber and Lyon (1996). Barber and Lyon investigate various methods for constructing accounting-based benchmarks of corporate performance to determine the reliability of tests conducted with them. One of their

primary conclusions is that when the firms in a sample exhibit abnormal performance prior to the event, the benchmark should be composed of firms with similarly abnormal performance. The reason is that performance may exhibit mean reversion and it is the deviation from the expected reversion that is the relevant measure of performance. To construct such a performance-adjusted benchmark, for each firm in the sample, we identify firms with the same two-digit SIC code which have sufficient data to calculate the ROA for each year from two years before through two years after the year of the announcement. From these firms, we choose as a benchmark the firm with the ROA closest to the ROA of the sample firm during the year before the self-tender offer, so long as the ROA of the benchmark firm is within 90% to 110% of the self-tender offer firm's ROA. This procedure yields a benchmark for 178 firms. For those firms for which we cannot identify a benchmark using these criteria, we replicate this procedure using a one-digit SIC code. This procedure yields a benchmark for all but four firms. For the remaining four firms, the procedure is replicated with no SIC code requirement. Finally, we calculate the performance-adjusted ROA by subtracting the ROA of the benchmark firm from the sample firm's ROA in the same year.

4.2. Results of analysis of changes in earnings

Table 2 presents the year-by-year mean and median ROAs, the mean and median industry-adjusted ROAs, and the mean and median performance-adjusted ROAs for both fixed-price (panel A) and Dutch auction (panel B) self-tender offers. Panel C presents the year-by-year differences between the means and medians given in panels A and B. Similarly, Table 3 shows the year-to-year changes in ROAs for fixed-price (panel A) and Dutch auction (panel B) self-tender offers, as well as the differences in the changes (panel C). Table 2 gives an indication of the year-to-year changes in ROA. The exact changes and the statistical significance of the changes are provided in Table 3.

For both the fixed-price and the Dutch auction samples, the data in Table 2 reveal little variation from year to year in the mean and median ROAs. More importantly, there is no uptick in earnings from the year before to the year after the self-tender offer for either set of firms. Indeed, to the extent that there is a trend in ROA, it is a mild erosion following the tender offers. The data further reveal that, on average, firms that conduct fixed-price self-tender offers and those that conduct Dutch auction self-tender offers performed significantly better than the median firm in their respective industries for up to five years prior to the year of the announcements. This superior industry-adjusted earnings performance before the offer is somewhat more pronounced for Dutch auction than fixed-price self-tender offers, but as shown in panel C, the difference in industry-adjusted ROA between the two samples typically is not significant.

Table 2

Operating performance around fixed-price and Dutch auction price self-tender offers

Mean and median levels of operating income divided by total assets in the years around announcements of 130 fixed-price and 102 Dutch auction self-tender offers for the period September 1981 through December 1994. Year 0 is defined as the fiscal year of the tender offer announcement. Industry-adjusted figures are the paired differences between the sample firms and their industry medians, while performance-adjusted figures are the paired differences between the sample firms and their respective performance-matched firms.

Year	-5	-4	-3	-2	-1	0	1	2	3	4	5
<i>Panel A: Fixed-price self-tender offers</i>											
Sample firms' ROA											
Mean	0.151	0.143	0.144	0.142	0.137	0.141	0.133	0.112	0.112	0.116	0.114
Median	0.143	0.127	0.138	0.138	0.134	0.141	0.123	0.119	0.121	0.114	0.112
Industry-adjusted ROA											
Mean	0.023 ^b	0.024 ^b	0.027 ^a	0.025 ^a	0.028 ^a	0.032 ^a	0.027 ^b	0.010	0.007	0.014	0.004
Median	0.013 ^b	0.026 ^a	0.024 ^a	0.017 ^b	0.014 ^b	0.030 ^a	0.023 ^b	0.015	0.018	0.008	0.012
Performance-adjusted ROA											
Mean	-0.002	-0.008	-0.025 ^b	-0.007	-0.001	0.021 ^b	0.017	0.000	0.002	0.005	0.002
Median	0.000	-0.005	-0.018 ^b	-0.010	0.000	0.015 ^b	0.010	0.000	0.001	0.004	0.006
Sample size	97	103	110	116	116	116	116	116	104	96	92
<i>Panel B: Dutch auction self-tender offers</i>											
Sample firms' ROA											
Mean	0.162	0.162	0.150	0.147	0.148	0.150	0.139	0.138	0.130	0.125	0.129
Median	0.157	0.161	0.152	0.144	0.148	0.144	0.140	0.135	0.139	0.122	0.128

Industry-adjusted ROA											
Mean	0.051 ^a	0.068 ^a	0.100 ^b	0.040 ^a	0.043 ^a	0.048 ^a	0.036 ^a	0.030 ^a	0.024 ^b	0.016	0.024 ^b
Median	0.037 ^a	0.038 ^a	0.036 ^a	0.030 ^a	0.035 ^a	0.036 ^a	0.030 ^a	0.027 ^a	0.018 ^a	0.018 ^b	0.027 ^a
Performance-adjusted ROA											
Mean	0.017	0.012	0.012	0.001	0.000	0.014	0.007	0.013	0.015	0.020	0.026
Median	0.021	0.011	0.005	0.005	0.002	0.013 ^b	0.007	0.003	0.009	0.008	0.010
Sample size	82	88	88	91	91	91	91	91	83	74	71

Panel C: Differences (Fixed-price less Dutch auction)

Sample firms' ROA											
Mean	-0.011	-0.019	-0.005	-0.005	-0.010	-0.009	-0.006	-0.026	-0.019	-0.009	-0.015
Median	-0.014	-0.034	-0.014	-0.006	-0.014	-0.003	-0.017	-0.017	-0.018	-0.007	-0.017
Industry-adjusted ROA											
Mean	-0.029 ^b	-0.044 ^b	-0.072	-0.015	-0.015	-0.015	-0.009	-0.019	-0.017	-0.002	-0.020
Median	-0.024	-0.012	-0.013	-0.013	-0.021	-0.006	-0.007	-0.012	0.000	-0.010	-0.015
Performance-adjusted ROA											
Mean	-0.020	-0.025	-0.037	-0.008	-0.001	0.007	0.010	-0.013	-0.013	-0.015	-0.024
Median	-0.021	-0.016	-0.023	-0.015 ^b	-0.002	0.003	0.003	-0.003	-0.008	-0.004	-0.004

^a and ^b denote significant differences from zero at the 0.01 and 0.05 levels, respectively. (Each mean and median ROA for the sample firms is significantly different from zero at the 0.01 level for both types of self-tender offers.)

Table 3

Changes in operating performance around fixed-price and Dutch auction self-tender offers

Mean and median changes in operating income divided by total assets in the years around announcements of 130 fixed-price and 102 Dutch auction self-tender offers over the period September 1981 through December 1994. Year 0 is defined as the fiscal year of the tender offer announcement. Industry-adjusted figures are the paired differences between the sample firms and their industry medians, while performance-adjusted figures are the paired differences between the sample firms and their respective performance-matched firms.

Year:	– 1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5
<i>Panel A: Fixed-price self-tender offers</i>						
Sample firms' ROA						
Mean	0.004	– 0.008	– 0.022 ^b	– 0.003	0.000	0.000
Median	0.003	– 0.004	– 0.014 ^a	0.005	0.000	– 0.003
Industry-adjusted ROA						
Mean	0.004	– 0.005	– 0.017	– 0.008	0.003	– 0.010
Median	0.004	– 0.001	– 0.007	0.000	0.001	0.000
Performance-adjusted ROA						
Mean	0.022 ^b	– 0.004	– 0.017	0.007	– 0.001	0.000
Median	0.015 ^b	– 0.004	– 0.012 ^b	0.010	0.002	– 0.007
Sample size	116	116	116	104	96	92
<i>Panel B: Dutch auction self-tender offers</i>						
Sample firms' ROA						
Mean	0.002	– 0.011	– 0.001	– 0.005	– 0.002	0.006
Median	0.002	– 0.003 ^b	0.000	– 0.002	– 0.001	0.001
Industry-adjusted ROA						
Mean	0.004	– 0.010	– 0.006	– 0.003	– 0.001	0.010
Median	0.006	– 0.003	– 0.005	– 0.002	0.001	0.005
Performance-adjusted ROA						
Mean	0.013	– 0.006	0.007	– 0.002	– 0.000	0.009
Median	0.015 ^b	– 0.004	– 0.004	– 0.004	– 0.003	– 0.001
Sample size	91	91	91	83	74	71
<i>Panel C: Differences (Fixed-price less Dutch auction)</i>						
Sample firms' ROA						
Mean	0.002	0.003	– 0.020 ^b	0.002	0.002	– 0.007
Median	0.001	– 0.001	– 0.014	0.007	0.001	– 0.004
Industry-adjusted ROA						
Mean	0.000	0.005	– 0.011	– 0.005	0.004	– 0.020 ^b
Median	– 0.002	0.001	– 0.002	0.001	0.000	– 0.005
Performance-adjusted ROA						
Mean	0.008	0.002	– 0.024	0.009	– 0.001	– 0.009
Median	0.001	0.001	– 0.008	0.014	0.005	– 0.006

^a and ^b denote significant differences from zero at the 0.01 and 0.05 levels, respectively.

In the typical year before the tender offers, firms in each sample outperformed their industry benchmarks by 2% to 5%. Moreover, this superior industry-adjusted performance continues after the year of the tender offer for both samples, although, as with the pre-announcement ROA, it is somewhat stronger for the Dutch auction than for the fixed-price sample.

According to Barber and Lyon (1996), it is such circumstances as those represented by the data in our analysis that a performance-adjusted benchmark is especially suited to ascertaining whether realized earnings are different from expected earnings. We should note that if we had perfectly matched performance-based benchmarks, performance-adjusted mean and median ROAs would equal zero in the year preceding the announcement. As shown in Table 2, both are close to or equal to zero for both samples of self-tender offers. In fact, even in year -2 , the mean and median performance-adjusted ROAs are very close to zero. These observations indicate that our matching procedure produces good performance-adjusted benchmarks.

Recall the premise of the Barber and Lyon procedure, that earnings exhibit mean reversion. Thus, in the normal course of events, firms that experience unusually high or unusually low earnings should expect to see their earnings revert over time toward the industry average. From our examination of ROA and industry-adjusted ROA we know that firms that undertake self-tender offers exhibit some erosion in ROA and industry-adjusted ROA in the years following self-tender offers. However, this erosion may be less pronounced or take place at a slower rate than might have been expected by market participants prior to the self-tender offers. If so, and if the performance-adjusted benchmark is representative of the 'normal' rate of mean reversion, performance-adjusted ROAs should be positive in the year of and/or in one or more years following the year of the announcement.

Indeed, as shown in panel A, the performance-adjusted mean and median ROAs for the announcement year (year 0) for the fixed-price self-tender offers are 2.1% and 1.5%, respectively, with p -values of 0.03 and 0.01. In panel B, for the Dutch auction sample, the mean and median performance-adjusted ROAs in year 0 are 1.4% and 1.3% with p -values of 0.07 and 0.04. As shown in panel C, the difference in the means and medians for the two samples in year zero is not significant (p -values are all greater than 0.10). The results in Table 3 reveal that the changes in performance-adjusted ROAs from year 0 to year 1 are statistically significant for both samples, but that there is no significant difference in the changes between the two samples. Furthermore, although the industry-adjusted ROAs tend to drift downward following the tender offer, in no year is either the mean or median performance-adjusted ROA negative for either sample following the announcement year, and in no year is the difference between the means or medians of the two samples significant at the 0.10 level. These results indicate that firms that conduct fixed-price self-tender offers and firms that conduct Dutch auction self-tender offers exhibit a less-pronounced reversion to the mean

than might have been expected by market participants prior to the announcement, but the rate of reversion is not different between the two samples.

We also investigate the changes in ROA for the performance-based benchmark firms (i.e., the firms with similar pre-announcement ROA) and find that each set of these firms exhibits a statistically significant mean reversion during the announcement year, but no significant changes in ROA during the following five years (not reported). In particular, the mean (median) change in the ROA in year 0 for the fixed-price performance-based control sample is -1.7% (-0.5%); for the Dutch auction performance-based control sample it is -1.1% (-0.3%). With the exception of the median change in the ROA for the Dutch auction performance-based benchmark, each of these declines in ROA is significantly different from zero at the 0.05 level.

Finally, we investigate changes in ROA over longer intervals. Specifically, we investigate changes in ROA from year -1 to each of the five years after the announcement year. The results indicate that industry-adjusted changes are more significant for longer intervals, while unadjusted and performance-adjusted changes are insignificant for longer intervals. For example, industry-adjusted ROA decreases significantly at the 0.10 level from year -1 to year 2 for both types of self-tender offers. However, there are no significant differences in the changes in ROA between the two types even for longer intervals.

Collectively, the results presented in this section indicate that there is no difference in the earnings signal between the samples of fixed-price and Dutch auction self-tender offers. The results indicate that firms that conduct self-tender offers are performing better than their industry peers before the year of the announcement and continue to outperform their industry peers following the announcement year (although not always by a statistically significant margin). To the extent that there is a signal about future earnings in self-tender offers during the 1980s and 1990s, it is that the firms' earnings will not revert to the 'normal' level as rapidly as other above-average performers from the same industries. But even here, there is no statistically significant difference between fixed-price and Dutch auction self-tender offers.

4.3. *Value Line forecasts*

A related question is whether the market interprets fixed-price self-tender offers as providing a stronger earnings signal than Dutch auction self-tender offers. If so, market participants should adjust their expectations of future earnings upwards to a greater extent in response to announcements of fixed-price than to announcements of Dutch auction self-tender offers. To investigate that question, we compare pre-announcement Value Line forecasts with post-announcement Value Line forecasts for the two types of self-tender offers. In these tests, the pre-announcement Value Line forecasts are proxies for the market's pre-announcement expected earnings and the post-announcement

Value Line forecasts are proxies for the market's post-announcement expected earnings.

Value Line publishes one-year and long-term earnings forecasts for a given firm every three months. We analyze both types of forecasts. We define the pre-announcement forecast as the last forecast published before the tender offer announcement, and the post-announcement forecast as the first forecast published after the tender offer announcement, providing that the post-announcement forecast was published at least five days after the tender offer announcement. In those cases where the first post-announcement forecast was published within five days of the tender offer, the second post-announcement forecast is used as the post-announcement forecast to ensure that the forecast includes information conveyed by the tender offer.

Value Line does not provide a forecast of EBDIT. Rather, Value Line gives a forecast of earnings after depreciation, interests and taxes (EAT). For our purposes, a deficiency with EAT is that it should decline following self-tender offers because of the way it is calculated. If assets are liquidated to finance the repurchase, EAT is reduced because of the lost income from those assets. If debt is used to finance the repurchase, EAT is reduced because of the incremental interest expense on the debt. Because the source of funds used to finance the tender offer cannot be determined, we estimate the expected reduction in EAT as

$$(\text{Expected change in shares outstanding} \times \text{Final tender price}) \times WACC, \quad (1)$$

where the expected change in shares outstanding is taken from Value Line and the weighted average cost of capital (*WACC*) is calculated as:

$$\begin{aligned} & \text{Cost of debt} \times (1 - \text{Expected tax rate}) \times \text{Debt ratio} \\ & + \text{Cost of equity} \times (1 - \text{Debt ratio}). \end{aligned} \quad (2)$$

The expected tax rate is taken from Value Line. The debt ratio is the book value of debt divided by the sum of the book value of debt and the market value of equity as of the year-end prior to the tender offer. For firm's with outstanding publicly traded bonds (69 firms), the cost of debt is measured as the weighted average yield to maturity of the firm's outstanding bonds for the month prior to the self-tender offer (collected from Moody's Bond Guide). For all other firms, the bond yield on Baa corporate bonds at the time of the announcement is used as the cost of debt. The cost of equity is estimated using the three-factor model of Fama and French (1993):

$$E(R_i) = R_f + b_i \times [E(R_m) - R_f] + s_i \times E(SMB) + h_i \times E(HML), \quad (3)$$

where R_f is the yield on the one-month T-bill as of the month of the tender offer announcement, b_i , s_i , and h_i are estimated with OLS regression using *CRSP*

monthly returns over the 60 months preceding the announcement, and $[E(R_m) - R_f]$, $E(SMB)$, and $E(HML)$ are approximated by their respective means over the ten years preceding the announcement.⁶

Pre- and post-announcement Value Line forecasts are available for 74 fixed-price and 79 Dutch auction self-tender offers. The mean (median) announcement-period CERs associated with these two samples are 7.2% (6.0%) and 6.8% (6.0%), respectively, and the p -value for the difference between the two is greater than 0.10. For these two samples, we repeat the analyses of Tables 2 and 3. The results are similar. In no case are the earnings improvements significantly different between the samples of fixed-price and Dutch auction self-tender offers.

Table 4 presents the mean and median revisions in Value Line earnings forecasts from before to after the announcements for the two types of tender offers. Panel A gives the unadjusted revisions in EAT forecasts (i.e., the net income without the adjustment for the lost earnings on liquidated assets and the increased interest expense on debt) and panel B gives the revisions in adjusted EAT forecasts. The revisions in the Value Line forecasts are given as a percentage of the pre-announcement Value Line forecast. As we noted, due to the mechanical calculation of EAT, Value Line revisions to unadjusted EAT forecasts are likely to be negative (assuming no other factors are at work in the data). In fact, that is the case: for both one-year and for long-term forecasts, Value Line revisions to unadjusted EAT are significantly negative, but the difference in mean (median) revisions between the two types of tender offers is not significant at the 0.10 level.

As shown in panel B, on average, the adjusted EAT figures exhibit positive revisions for both samples and for both one-year and long-term earnings forecasts. None of the mean or median revisions are statistically significantly different from zero at the 0.05 level; but both of the median revisions of the one-year forecasts are significant at the 0.10 level. Thus, there is, at best, modest support for the idea that Value Line revises its earnings forecasts upwards in response to self-tender offer announcements. However, as also reported in Table 4, neither the mean nor median revisions in the forecasts of adjusted EAT is statistically different between fixed-price and Dutch auction self-tender offers for either one-year or long-term earnings forecasts (p -values all greater than 0.10).⁷

⁶ The values for $[(R_m) - R_f]$, SMB , and HML were provided to us by Eugene Fama.

⁷ The procedure for adjusting the earnings forecast in our Value Line analysis involves a host of assumptions. We select parameters that would be biased toward rejecting the null hypothesis that revisions in earnings forecasts are zero. We also conduct numerous experiments with other parameters and other ways of the adjusting the earnings forecast. For example, we also estimate the cost of equity with the traditional Sharpe-Lintner CAPM, and we estimate the cost of debt as the annual interest expense divided by the book value of debt outstanding. With none of the various experiments are we able to reject the null of no difference between the revisions in earnings for fixed-price and Dutch auction self-tender offers.

Table 4
Revisions in Value Line earnings forecasts

The percentage revisions in the Value Line earnings forecasts from before to after self-tender offer announcements. The change in adjusted net income is defined as: Change in net income + [(Expected change in outstanding shares \times Final tender price) \times WACC], where the expected change in outstanding shares is taken from Value Line and WACC is calculated as Cost of debt \times (1 – Expected tax rate) \times Debt ratio + Cost of equity \times (1 – Debt ratio). The expected tax rate is taken from Value Line. The debt ratio is the book value of debt divided by the sum of the book value of debt and the market value of equity. The cost of debt is approximated by the value-weighted average yield to maturity of the firm's outstanding bonds, or the bond yield on Baa corporate bonds at the time of the announcement if no bond prices are available. The cost of equity is estimated using the three-factor model of Fama and French (1993): $E(R_i) = R_f + b_i \times [E(R_m) - R_f] + s_i \times E(SMB) + h_i \times E(HML)$, where b_i , s_i , and h_i are estimated over the five years preceding the announcement using monthly returns, and $[E(R_m) - R_f]$, $E(SMB)$, and $E(HML)$ are approximated by the respective means over the ten years preceding the announcement. For the short-term forecast, if the time between the expiration of the offer and the end of the fiscal year of the forecast is less than one, the adjustment to the net income is prorated accordingly. The long-term forecasts have fewer observations because the observations that have different long-term forecast periods in the reports before and after the announcement are deleted. (*p*-values are reported in parentheses.)

	Percentage revision of one-year ahead forecast	Percentage revision of long-term forecast
<i>Panel A: Net Income</i>		
Fixed-price self-tender offers		
Mean revision	– 7.7 (0.04)	– 7.9 (0.00)
Median revision	– 6.1 (0.00)	– 5.1 (0.00)
Sample size	74	60
Dutch auction self-tender offers		
Mean revision	– 9.0 (0.00)	– 7.2 (0.00)
Median revision	– 5.2 (0.00)	– 3.4 (0.00)
Sample size	79	60
Difference		
Mean revision	1.3 (0.74)	– 0.7 (0.81)
Median revision	– 0.8 (0.63)	– 1.7 (0.72)
<i>Panel B: Adjusted Net Income</i>		
Fixed-price self-tender offers		
Mean revision	5.9 (0.10)	3.2 (0.32)
Median revision	4.6 (0.08)	0.0 (0.21)
Sample size	68	56
Dutch auction self-tender offers		
Mean revision	2.3 (0.33)	1.0 (0.55)
Median revision	1.3 (0.06)	0.0 (0.49)
Sample size	75	58
Difference		
Mean revision	3.6 (0.38)	2.2 (0.46)
Median revision	3.2 (0.28)	0.0 (0.84)

5. Sensitivity analysis

5.1. *Alternative measures of performance*

To investigate the robustness of the results in Tables 2 and 3, we considered other measures of performance: (1) we standardized EBDIT by sales rather than assets; (2) we standardized EBDIT by assets minus cash (which may give a better indication of the size of the firm's operating assets); (3) we used a cash-flow measure of EBDIT to mitigate any effects of earnings manipulation (Barber and Lyon, 1996); and (4) we replicated the time-series analysis of Dann et al. (1991). The results (not reported) are similar to those in Tables 2 and 3. In no case did we find a statistically significant difference in either the means or medians of the change in performance from before to after the tender offer between firms that undertook fixed-price self-tender offers and those that undertook Dutch auction self-tender offers (all p -values > 0.10).

5.2. *Managers' tendering behavior*

Comment and Jarrell (1991) argue that the strength of the signal depends not only on the type of self-tender offer, but also on whether managers tender their shares and whether the offer provides a positive premium. Their argument is that in such tender offers managers are 'at risk' if the tender offer is not accompanied by an increase in earnings. In particular, they hypothesize that the signal will be stronger in cases in which managers do not tender their shares and in which the minimum tender offer premium is at least 2%. If they are correct, we should control for whether managers tender their shares and for the level of the premium in comparing the two types of tender offers.

For our sample, we are able to determine definitively that managers tendered shares in 18 of the fixed-price self-tender offers and in eight of the Dutch auction self-tender offers. For 61 of the fixed-price tender offers and for 79 of the Dutch auction tender offers we can determine definitively that managers did not tender. For the remaining 51 fixed-price and 15 Dutch auction tender offers, we can find no information on whether managers tendered shares. We classify an offer as 'at risk' if managers tendered and the minimum premium was at least 2%; all others are classified as 'not at risk'. Initially, we classify those cases in which we cannot determine whether managers tendered as cases in which they did not tender shares. Then, we exclude these cases and redo the tests.

Of the 112 fixed-price tender offers initially classified as offers in which managers did not tender, earnings data are available for 99, of which the tender premium is at least 2% for all but eight, leaving 91 in which managers are 'at risk'. Of the 94 Dutch self-tender offers initially classified as tender offers in which managers did not tender, earnings data are available for 84, of which the tender premium is at least 2% in only 37.

Based on our initial classification scheme, the announcement-period mean (median) CER of the fixed-price ‘at risk’ sample is 9.3% (8.5%); for the Dutch auction ‘at-risk’ sample it is 11.9% (10.3%) (p -value for the difference is 0.12 (0.36)). Thus, based on the CERs, even for the at-risk samples, there is no evidence that fixed-price self-tender offers provide a stronger signal than do Dutch auction self-tender offers.⁸

Also based upon the initial classification scheme, we replicate the earnings analysis of Tables 2 and 3 for the two at-risk samples. The results (not shown) are nearly identical to those in Tables 2 and 3. In particular, neither differences in the levels nor differences in the changes in the levels of industry-adjusted and performance-adjusted mean and median ROAs between the two samples are significant at the 0.10 level. Furthermore, for both at risk samples, the performance-adjusted ROA indicates an improvement in earnings in year 0, but the other two benchmarks do not. The magnitudes of these statistics are almost identical to those in Tables 2 and 3, but the statistical significance is lower, presumably because of the smaller samples.

We then delete those cases in which we can locate no information about whether managers tendered, and recalculate the tests. The sample sizes for the two at-risk samples are now 61 (fixed-price) and 37 (Dutch auction). The announcement-period mean (median) CERs of 9.5% (8.6%) and 11.3% (10.3%) for the two samples are not significantly different from each other (the p -value for the difference is 0.37 (0.53)). Similarly, none of the measures of ROA are significantly different between the two samples at the 0.10 level of significance.⁹

We also replicated the Value Line analysis for the fixed-price and Dutch auction samples in which managers were and were not at risk. Based on our initial classification scheme, there are 57 fixed-price and 33 Dutch auction tender offers in which managers were at risk. For these samples, the results (not shown) are very similar to those in Table 4. After deleting cases in which we cannot determine definitively whether managers were at risk, the at-risk sample sizes are 35 and 31. Again, the results (not shown) are similar to those in Table 4.

5.3. *Confounding news announcements*

Comment and Jarrell (1991) report that the average announcement-period excess return is significantly higher for fixed-price self-tender offers than for

⁸ We also calculated announcement period CERs for the two ‘not-at-risk’ samples. The mean and median of the differences in CERs between the fixed-price and Dutch auction samples are not significant at the 0.10 level. Consistent with Comment and Jarrell, the mean and median announcement period CERs are higher for the ‘at-risk’ than for the ‘not-at-risk’ sample.

⁹ All unreported results are available on request.

Dutch auction self-tender offers, but only when they exclude offers with coincident confounding news. To identify confounding news, we review the WSJ and the DJNR service for confounding news within the five-day interval surrounding the self-tender offer announcements. These include announcements related to corporate control activity (14 offers), asset sales (12 offers), earnings forecasts (8 offers), asset purchases (5 offers) and other items (5 offers). Of these, 30 are from the fixed-price sample and 14 are from the Dutch auction sample. These offers are deleted from the samples.

The mean (median) announcement-period CER of 10.2% (8.6%) is larger for the fixed-price tender offers than is the mean (median) CER of 7.6% (6.2%) for the Dutch auction tender offer and the difference is significant at the 0.05 level. However, when we replicate the earnings analysis of Tables 2 and 3 and the Value Line analysis of Table 4 for these samples, none of the differences between the sample means or medians is significant at the 0.10 level.

5.4. Defensive versus non-defensive self-tender offers

Self-tender offers may be used to defend against hostile takeovers (Dann and DeAngelo, 1988; Stulz, 1988; Denis, 1990; and Bagwell, 1991). This motivation was likely to have been especially prevalent during the late 1980s, which witnessed a particularly active market for corporate control (Comment and Schwert, 1995). This period includes a large portion of the self-tender offers in our sample. To investigate whether the inclusion of defensive self-tender offers has a consequential impact on our results, we repeated all of the analyses in Tables 2–4, excluding defensive self-tender offers from the sample. We define a self-tender offer to be defensive if the announcement stated that the motivation for the offer was to deter a takeover, or if there were takeover rumors in the WSJ, WSJI, or DJNR during the three months prior to the announcement. Sixteen of the 116 fixed-price and eight of the 91 Dutch auction self-tender offers in the earnings analysis are classified as defensive. For the samples in the Value Line analysis, 20 of the tender offers in the fixed-price sample and nine of the tender offers in the Dutch auction sample are classified as defensive. None of the results for any of the tests is substantially changed when defensive self-tender offers are deleted from the analyses.

5.5. Regression analysis

As a further test, we estimate a regression in which the dependent variable is the change in performance-adjusted ROA from year -1 to year 0, and the independent variables include an indicator variable identifying whether the tender offer was fixed-price or Dutch auction, an indicator variable to identify whether management was ‘at risk’, and an indicator variable to identify whether the tender offer was defensive. Even after controlling for these factors, earnings

performance is not significantly different between fixed-price and Dutch auction self-tender offers. In fact, none of the coefficients is statistically significant at the 0.10 level. We replicated the regression using the change in industry-adjusted performance as the dependent variable, using other measures of change in performance as the dependent variable, and measuring the change in performance over other intervals. In no case is the coefficient of the indicator variable for fixed-price versus Dutch auction self-tender offers significant at the 0.10 level.

5.6. Multiple offers by the same company

In each of our analyses, we include some companies that have undertaken more than one self-tender offer: 11 with two self-tender offers and four with three self-tender offers. On average, these transactions were separated in time by 28.5 months (median = 20.5 months). It could be that either the first or a subsequent offer provides a stronger signal, and rationales could be imagined for either finding. If so, inclusion of the 'weaker' signal will reduce the ability of our tests to reject the null hypothesis. Initially, we include only the first tender offer by a firm. We then include the second offer for firms with multiple self-tender offers. We also devise a test in which the tender offer with the highest CER is used for firms with multiple tender offers. For each set, we recalculate the tests of Tables 2–4. In no case is the difference between fixed-price and Dutch auction tender offers for the various measures of ROA significant at the 0.10 level.

5.7. Correlation between earnings and excess returns

The earlier studies of self-tender offers (Hertzel and Jain, 1991 and Dann et al., 1991) not only document an improvement in average earnings, but also document a positive correlation between the improvement in earnings and excess stock returns. For completeness, we estimate this correlation for each type of tender offer. Regardless of the measure of earnings improvement employed, and regardless of the time interval over which excess returns are measured, we find no difference in the correlation between earnings improvement and excess stock returns for the two types of tender offers. In fact, none of the correlations between earnings improvements and excess stock returns for either sample is significant at the 0.10 level.

6. Can the improvement in operating performance explain the excess stock returns?

The improvement in operating performance following the self-tender offer announcements in our sample appears modest. The obvious question is whether the magnitude of this improvement can possibly explain an average stock price

increase of roughly 8%. To the extent that there is support for this proposition, it derives from the performance-adjusted ROA, which is roughly 2% in year 0, 1% in year 1, and 0.5% per year thereafter. We use a simple numerical example based on the data from our sample to answer this question.

Suppose a firm has book value of assets of \$100, total debt of \$40, current ROA of 14%, a corporate tax rate of 40%, and a weighted average cost of capital of 12%. If the firm's cash flow is approximated by its earnings after taxes, and the growth in cash flow is 3.3% per year, the firm's total value is

$$\begin{aligned} \text{Firm value} &= \frac{\text{After-tax cash flow in year 1}}{\text{Cost of capital} - \text{Growth in cash flow}} \\ &= \frac{0.14 \times \$100 \times (1 - 0.4) \times (1 + 0.033)}{0.12 - 0.033} \approx \$100. \end{aligned} \quad (4)$$

Furthermore, the value of the equity equals \$100 - \$40 = \$60.

Suppose that the firm announces that it will repurchase 20% of its equity, consistent with the actual figures for our sample. Further assume that this transaction is to be financed entirely with debt. As a result, total debt increases to \$40 + 0.2 × \$60 = \$52. Moreover, assume that the weighted average cost of capital is unchanged by the repurchase and the change in leverage. Based upon the performance-adjusted ROA in Table 2, suppose that the announcement signals to the capital market that future operating performance will be higher than previously expected, by 0.02 for the next fiscal year, by 0.01 for the fiscal year two years from now, and by 0.005 for each fiscal year thereafter. Consequently, the firm's value increases by

$$\begin{aligned} \text{Increase in firm value} &= \frac{\$2 \times (1 - 0.4)}{1.12} + \frac{\$1 \times (1 - 0.4)}{1.12^2} \\ &\quad + \frac{\$0.5 \times (1 - 0.4)/0.12}{1.12^2} = \$3.54. \end{aligned} \quad (5)$$

Moreover, the value of the equity following the announcement increases as

$$\begin{aligned} \text{New equity value} &= \text{New firm value} - \text{Total debt after repurchase} \\ &\quad + \text{Payout to equityholders} \\ &= \$103.54 - \$52 + \$12 = \$63.54. \end{aligned} \quad (6)$$

The increase in value of equity is \$3.54/\$60 = 5.9%, a number consistent with various CERs calculated for our sample. Thus, the documented earnings improvement, though modest, can justify an announcement-period CER of the magnitude observed for our sample.

7. Conclusion

Prior investigations of fixed-price corporate self-tender offers indicate that: (1) fixed-price self-tender offers undertaken during the 1960s and 1970s were associated with positive and statistically significant announcement-period excess stock returns of roughly 16%; (2) the tender offers were accompanied by an improvement in firms' operating performance; and (3) announcement-period excess stock returns were correlated with the improvement in operating performance. One popular interpretation of this evidence is that the excess stock returns are the result of a signal about future earnings that is conveyed by the self-tender offer announcement.

Dutch auction self-tender offers were introduced in 1981 and have since become the predominant form of self-tender offer. Several authors argue that the signal in fixed-price self-tender offers should be stronger than the signal in Dutch auction self-tender offers. We investigate that question empirically with large samples of fixed-price and Dutch auction self-tender offers that took place between 1981 and 1994. We find no difference in announcement-period excess stock returns between the two types of self-tender offers (both are about 8%), and we find no difference in earnings improvement between the two types of offers. Indeed, for two of three benchmarks, historical earnings and industry-adjusted earnings, we can detect no improvement in earnings for firms that conduct either type of self-tender offer. However, we do find that both sets of firms exhibit superior earnings performance in comparison with an own-industry benchmark prior to the self-tender offers. In circumstances such as these, Barber and Lyon (1996) argue that the appropriate procedure for judging whether operating performance is 'abnormal' is the construction of a benchmark of firms with similarly superior performance prior to the event in question. When we use such a performance-based benchmark, we find that firms in both sets of tender offers exhibit superior performance during the year of the tender offer. Firms that undertake self-tender offers exhibit slower mean reversion in their operating performance than does the 'typical' firm in the same circumstances. Furthermore, a numerical example based upon the magnitude of the earnings 'surprise' indicates that the observed 'improvement' could sustain an excess stock return of the size observed. If there is an earnings signal in self-tender offers during the 1980s and early 1990s, it is that such firms will continue to exhibit superior performance longer than might otherwise have been expected, but, even on this basis, there is no difference in operating performance between firms that undertake fixed-price self-tender offers and firms that undertake Dutch auction self-tender offers. Consistent with our analysis of earnings, an analysis of Value Line earnings forecasts gives no indication that the revisions in its earnings forecasts differ between the two types of self-tender offers. If self-tender offers signal an improvement in earnings, the data analyzed here indicate that there is no difference in the strength of the signal for fixed-price and Dutch auction self-tender offers.

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