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DETERMINANTS OF THE MERGER ACCOUNTING CHOICE

David Ravenscraft and F. M. Scherer*

Much has been written from both normative and positive (explanatory) perspectives about the choice between purchase and pooling-of-interests accounting for mergers and acquisitions. This paper extends the positive literature by presenting the results of an unusually wide-ranging statistical study of merger accounting choices.

Normative statements by the AICPA and Accounting Principles Board tried to, and presumably did, influence business enterprises' choices. There is reason to believe that pooling accounting became more widely used as guidelines were clarified and in some respects weakened between 1950, with the publication of AICPA Research Bulletin 40, and November 1970, when APB Opinion No. 16 on "Business Combinations" became effective. APB 16's restrictive language is believed to have turned the tide and discouraged poolings, although the quantitative evidence on this point is meager.

The positive scholarly literature has been concerned primarily with answering two questions:[1] whether the choice of accounting methods has been influenced by companies' desire to put post-merger earnings and

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Use is made of Line of Business data collected by the Federal Trade Commission. A review by FTC staff has determined that individual company data are not disclosed. The conclusions are the authors' and not necessarily those of the FTC.

returns on book equity in the most favorable light, and whether the stock market's evaluation of post-merger performance is significantly influenced by the accounting method choice. The answer to the first question has been increasingly affirmative as companies achieved greater sophistication in their understanding of the alternatives. On the second question, the evidence is more equivocal but generally negative.

Our approach to the problem is broader in both the set of hypotheses tested and the scope of the data examined. It stemmed from the development of a merger data base linked to the Federal Trade Commission's Line of Business (segmental) financial performance reports for the years 1974-77. As a part of the effort, comprehensive information on merger accounting choices between 1950 and 1978 was needed. For this purpose, the sampling method used in previous studies -- confined to mergers for which New York Stock Exchange listing statements were issued -- would not suffice, since such statements cover fewer than a fourth of all acquisitions and are biased toward mergers in which new common or preferred stock is issued. Yet when one attempts to extend the coverage, one discovers that even during the 1970s, when disclosure regulations had become more stringent, the information made public by corporations is quite incomplete. Our objective therefore was to develop a prediction model by which one could, using the data available on individual acquisitions, reliably predict the accounting method chosen even when no purchase - pooling disclosure was made.

The Sample

Our working sample consisted of 6,827 acquisitions consummated between 1950 and 1979 by the 472 corporations comprising the FTC's Line of

Business survey for 1975-77.2/ The FTC survey was primarily concerned with manufacturing industries, and so our focus was on mergers linked to any of 261 standardized manufacturing Line of Business categories. Although some data on nonmanufacturing mergers were gathered and are discussed in a footnote, the emphasis was on manufacturing.

An extensive effort was made to identify the accounting treatment chosen (i.e., purchase, pooling, dirty pooling, or equity) for each merger in the sample. Four main thrusts were taken. First, a personalized letter was written by the second author to the chief financial officer of each sample corporation, asking that his staff code a list of the company's recorded manufacturing mergers as to accounting treatment. A 42 percent response rate was achieved. However, because company respondents sometimes lacked the necessary historical records, not all relevant mergers on the list were coded, and subsequent research revealed that some mergers had been omitted from the lists. Second, a team of research assistants screened annual reports, 10-K reports, and other disclosure documents on file at the Securities and Exchange Commission's corporate records library in Washington, D.C. Unfortunately, most such records for years earlier than 1967 had been destroyed because of space limitations. Thus, a third search of missing annual reports was conducted at the business school libraries of the University of Pennsylvania, Northwestern University, and Harvard University. Three different university libraries were visited to minimize the difficulties of working with microfilm and to span coverage gaps at each institution.[3] Finally, all missing observations and all on which conflicting information had been recorded

were researched using the University of Pennsylvania's nearly complete hard-bound collection of New York Stock Exchange listing statements.

This four-phase search yielded accounting method information on 4,562 of the 6,827 sample mergers and acquisitions.[4] Because explicit disclosure is more likely on larger mergers, the mergers on which information was obtained accounted for approximately 87 percent of total estimated acquired entity sample assets. For the remaining 2,265 (mostly smaller) acquisitions, the identification of accounting method, if possible at all, had to come from use of the prediction model presented here.

Hypotheses and Variables

Several predictive hypotheses and variables, some similar to those used in earlier studies and some new, were developed.

By analyzing only listing statement mergers, previous studies have been confined to mergers based upon an exchange of stock. Our sample is not so restricted. Especially since APB 16, but even before, one would expect exchange-of-stock transactions to be more likely to be treated as poolings than cash acquisitions or (since APB 16) mixed cash-stock transactions. The data on this facet came from the Federal Trade Commission's historical mergers and acquisitions computer tape, augmented by information from listing statements, annual reports, and Moody's Industrials Manual. The FTC tape distinguishes among mergers effected through an exchange of securities (including bonds), those made for cash, and those entailing a combination of cash and securities as consideration. Even accepting this limitation, which permitted no distinction (possibly important since 1970) between common and preferred stock transactions, the

data were incomplete. Faced with missing data on an important variable, one can either drop the observation from the sample or "plug" the missing observation at some average value. Consistent with our desire for comprehensiveness, we adopted the "plug" alternative. However, in "plugging' the 1 - 0 all-securities dummy variable at its average known-sample value of 0.62, one may be imparting a bias, since the mergers for which no consideration type data are available tend to be the smaller ones on which no stock listing statement was filed, and for them the incidence of cash-only transactions may have been higher than for the whole sample. To control for this possible bias, we adopted what we believe (perhaps wrongly) to be a novel technique of multiplying a separate 1 - 0 "plug" dummy variable by the plugged value and letting the estimated coefficient on that synthetic variable correct for the plugging bias.

Early AICPA research bulletins placed considerable weight on the relative size of the merging firms, arguing that pooling was normally appropriate only when the acquired entity was not small relative to the acquirer, the threshold for "smallness" being variously placed in the range of 5 to 20 percent of exchanged shares. This criterion disappeared from APB 16, although only after the APB had provisionally accepted its continuation. Our prediction variable is the ratio of the acquired to the acquiring entity's (sometimes roughly) estimated assets (or when asset data were unavailable, consideration paid). We expect that the larger the relative size of the acquired entity was, the more likely pooling was, especially before 1970.

Previous research has shown that, especially after the 1950s, pooling was likely when the acquirer paid a substantial stock premium over the

acquired firm's book value, whereas purchase accounting was favored when acquisitions were made for below-book consideration values. This rule of thumb leaves the acquiring firm with asset and equity values that enhance subsequent accounting rates of return on equity. Our approach to this phenomenon is complicated by two factors.

For one, unlike previous analyses, our sample includes both tax-free mergers and acquisitions taxable to the original acquired entity owners. The rule of thumb stated above applies clearly only for tax-free acquisitions, usually those associated with an exchange of stock. For cash acquisitions, which tend to be taxable, incentives might be reversed, since by treating an acquisition on which it paid a premium above book value as a purchase, the acquiring firm can often "step up" real asset values and enjoy a higher depreciation shield against corporate income taxes, thereby enhancing cash flow.

Second, by covering a sample much broader than those on which NYSE listings were published, we could only determine the values of both consideration paid and acquired entity book value for 1,409 of our 4,562 mergers. To estimate for the full sample the effect of market conditions conducive to the payment of premiums over book, we were forced to adopt a cruder, more aggregative approach. Specifically, we introduce a variant of Tobin's Q index,[5] measuring for any given year the average ratio of consideration paid to book value for all the mergers in that year for which data on both variables were available.[6] A separate disaggregated analysis is conducted for the 1,409 merger subset on which full individual consideration and book value data were available. In both instances, a

stronger tendency toward pooling is expected for acquisitions consummated with stock when the Tobin's Q index is high. For cash acquisitions, the opposite pattern is expected.

APB 16 requires the use of purchase accounting for acquisitions of only part of a company (e.g., subsidiaries, divisions, or plants) and for acquisitions in which an early and substantial sell-off of acquired assets is contemplated. Earlier writings included similar criteria, but more permissively. Moody's Industrials and other sources were used, no doubt with incomplete success, to identify acquisitions followed by substantial sell-offs within the next three years. The FTC merger history tape, supplemented by other sources such as Moody's, was used to identify acquisitions that comprised only a division or other fractional part of the selling entity's assets.

For either industry-specific or idiosyncratic reasons, different companies may, especially before 1970, have manifested markedly divergent preferences for one mode of accounting over another even when such "objective" variables as relative size and the form of exchange were the same. We therefore include in our analysis a company-specific policy variable denoting the fraction of all accounting choice-coded acquisitions (excluding the one being analyzed) made under pooling, given that the company had at least five coded acquisitions over the 1950-79 sample span. For companies with fewer than five coded acquisitions, a "plug" was inserted giving the fraction of coded poolings to all sample company coded acquisitions. Since companies with fewer than five coded acquisitions are not necessarily representative of the entire sample, a bias control dummy

variable, multiplying 1 times the plug value for any plugged acquisition, was also introduced.

Finally, we have noted repeatedly that the rules governing accounting method choices and perhaps also companies' subjective preferences have changed over time -- presumably toward increasing use of pooling up to 1970 and decreasing use thereafter. These possible temporal changes are taken into account in three ways. First, a time trend variable (with 1950 = 0) will be introduced. Second, the sample will be divided into pre- and post-1970 acquisitions, and the homogeneity of coefficient estimates between time periods will be tested. Because APB 16 was issued in exposure draft form in February 1970 and might have had some preemptive influence, we delete that year from the split sample. Third, various nonlinear tests are conducted to determine the year in which pooling-of-interest accounting use peaked.

To sum up, the variables used in our analysis, their mnemonic characterizations,[7] and their full-sample means are as follows:

Mnemonic	Description	Mean Value
ACCTG	A dummy variable reflecting the accounting mode chosen: 1 if pooling, 0 if purchase	0.554
STOCK	A dummy variable reflecting the consideration form: 1 if all securities; plugged at 0.62 if consideration type unknown; 0 otherwise.	0.701
STPLG	A dummy variable with a value of 1 if the STOCK variable was plugged at 0.62	0.152
MIXED	A dummy variable with a value of 1 if the merger consideration was a combination of securities and cash (plugged at 0.05 if the consideration type was unknown).	0.044
PARTIAL	A dummy variable with a value of 1 for acquisitions of only a part of the selling firm's assets	0.059

DIVEST	A dummy variable with a value of 1 for acquisitions followed within three years by a substantial asset sell-off	0.019
RELSIZ	The ratio of the acquired to the acquiring entity's estimated assets at the time of acquisition	0.049
Q-STOCK	Aggregate Tobin's Q (consideration / book value) for the year of acquisition if stock acquisition; zero otherwise	1.059*
Q-CASH	Aggregate Tobin's Q for cash acquisitions; zero if not a cash acquisition	0.382*
P-STOCK	For subsample, individual premium index (i.e., consideration / book value) on stock acquisitions; zero otherwise	1.224
P-CASH	For subsample, individual premium index for cash acquisitions; zero if not a cash acquisition	0.280
EXPER	Fraction of other coded mergers accounted for as poolings for individual companies with five or more coded mergers	0.541
EXPLG	Dummy variable with value of 1 if a company had fewer than five coded mergers, so that the all-sample pooling ratio (.527) was inserted into EXPER	0.062
YEAR	Time trend variable (1950 = 0; 1979 = 29)	17.60

Methodology

Most earlier studies of merger accounting method choices have relied primarily upon comparisons of average values for a limited array of classificatory variables. Because we have a much richer set of explanatory variables, the preferred methodology is multiple regression analysis. However, because the dependent variable ACCTG consists entirely

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*When these ratios are divided by the relative frequency of stock or cash acquisitions, the raw average Q value is obtained, i.e., 1.510 for stock acquisitions and 1.501 for the cash transactions.

of ones (for pooling) and zeroes (for purchase), the ordinary least squares regression technique has problems. The residual errors from such regressions tend to be bimodally distributed, violating the assumptions of normality and homoscedasticity required by classical statistical tests. Also, predicted values of the dependent variable can lie outside the tolerable range of 0 to +1.

To obtain statistically efficient estimates, we use instead the logit technique.[8] A logit regression estimates the probability that the dependent variable will be equal to one, i.e., in our case, that a merger will be treated as a pooling. Concretely, it assumes that the probability will conform to a logistic transformation:

$$(1) \qquad Pr(ACCTG = 1) = \frac{e^{\sum_i b_i X_{ij}}}{1 + e^{\sum_i b_i X_{ij}}} ,$$

where X_{ij} is the i^{th} independent variable for acquisition j and b_i is a regression coefficient estimated nonlinearly by maximum likelihood methods for independent variable i. Note that although $\Sigma\, b_i X_{ij}$ can have either positive or negative values without bound, the logistic transformation ensures values of Pr(·) in the range of 0 to 1. When $\Sigma\, b_i X_{ij} = 0$, Pr(·) = 0.5, i.e., pooling and purchase are equally likely. This feature makes logit a convenient predictor (i.e., predicting pooling when $\Sigma\, b_i X_{ij} \geq 0$) that is more efficient statistically than so-called discriminant analysis methods.

A disadvantage of logit analysis is the difficulty of attaching intuitive meaning to the estimated b_i coefficients. Analyzing a 1-0 dependent variable by ordinary least squares, one can interpret the

coefficient estimates as the marginal increase in the probability of pooling associated with a unit increase in the explanatory variable. Such inferences cannot be drawn directly from logit analysis. However, by differentiating equation (1) with respect to X_{ij}, one finds that the comparable probability can be approximated by $b_i (Z(1 - Z))$, where Z equals the estimated right-hand-side value of equation (1), with mean values of the independent variables substituted in for the X_{ij}. For each logit regression presented, the corresponding approximation factor (Z(1 - Z)) will also be reported. In addition, for purposes of comparison, one least-squares regression for the full sample will be presented in the appendix to this paper.

The Results

An overview of sample patterns can be gained by examining the percentages of mergers that were accounted for as poolings, sub-classified by time period and key variables. The percentage pooling figures are as follows:

	1950-1979	Pre-1970	Post-1970
All sample mergers	55%	59%	45%
Stock only	81	82	80
Cash only	8	10	5
Mixed consideration	21	29	8
Partial acquisition	12	17	6
Subsequently divested	55	57	48
RELSIZ > .10	62	68	31
RELSIZ < .10	55	58	46
Tobin's Q > 1	57	62	46
Tobin's Q < 1	33	39	7

The fraction of mergers treated as poolings is similar to that reported by Gagnon for 1955-58 samples, but much lower than in the later Copeland-Wojdak and Anderson-Louderback studies. There is clear evidence of a drop in the use of pooling after APB 16 appeared in 1970. All-stock acquisitions were much more apt to be treated as poolings than cash and mixed consideration transactions. Acquisitions of only a part of the seller's assets were characteristically handled as purchases, especially following APB 16. Mergers made when Tobin's Q was relatively high were more likely to be poolings, as expected for stock transactions, although on this point, multivariate analysis is plainly needed.

Table 1 presents the coefficient estimates from logit regressions for the full sample period (1950-79) and for the pre- and post-1970 subperiods.[9] T-ratios for the coefficients are given in subscripted parentheses; statistical significance (one-tail tests) is shown at the .05 level by one asterisk and at the .01 level by two asterisks.

Many but not all of the a priori hypotheses are confirmed. There are clear differences between the pre- and post-1970 periods, as shown inter alia by a highly significant likelihood ratio of 112.5 in a test for homogeneity of coefficients between the two sub-periods.[10] Before 1970, there was a significant trend <u>toward</u> pooling; after 1970, a weaker reverse trend materialized. The STOCK consideration variable performs only weakly before 1970 but strongly and in the expected direction after 1970. The STPLG*STOCK correction term shows that acquisitions for which consideration form information was unavailable are wrongly characterized as typical of all transactions. Rather, they are more apt to be purchases,

presumably because they are small and made with cash. Mixed consideration acquisitions have unpredictable accounting method choices, all else equal. Acquisitions of only parts of an enterprise are unlikely to be treated as poolings. Sell-offs within three years of a merger make little difference in treatments, even after the 1970 APB guidelines called for purchase accounting when sell-off was contemplated. The 1970 guidelines appear to have obliterated the role of relative size, which was an important predictor previously. The most potent predictor of all is general company policy, reflected in the EXPER variable. Indeed, the company policy variable's impact is significantly greater in the post-1970 sample than before. The behavior of the aggregate Tobin's Q variable is surprising. For all years together, a high Q value was conducive to pooling accounting on stock (i.e., tax-free) transactions, as expected. However, the relationship deteriorates within time sub-periods, probably because Q values were relatively high before 1970 and relatively low thereafter, so that valuation effects at an aggregate level may have become confounded with time trend effects. To disentangle the relationships, we shall turn shortly to disaggregated Q data.

The line "Correct Predictions" tells what fraction of predictions turn out correctly when each acquisition's independent variables are plugged into the estimated logit equation and poolings are distinguished from purchases by equation values greater than or equal to 0.5. Using this discriminant technique, with or without a time period breakdown, correct predictions are made 84 percent of the time. This strong result is gratifying, since it implies that by applying the estimated model to the 2,265 acquisitions on which accounting method choice data are unavailable,

only about 360 wrong predictions will be made (in a complete universe encompassing 6,827 mergers).[11] The higher degree of prediction accuracy after 1970 suggests that APB 16 succeeded in reducing the amount of ambiguity in purchase - pooling choices.

To see in more detail how these predictions are made, suppose Company ABC acquired Company XYZ through a pure stock transaction in 1968. XYZ was a whole company whose assets were 5 percent those of acquirer ABC. Of ABC's other acquisitions, 54 percent were accounted for as poolings. In 1968, the value of Tobin's Q as used here was 1.68. Assume also that XYZ was not divested within three years. Using the all-years coefficient values from Table 1, the computed value of $\Sigma\, b_i X_{ij}$ is therefore:

Constant	- 2.964
STOCK	+ 1.268
RELSIZ	+ 1.295 X 0.05
YEAR	+ 0.0015 X 18
EXPER	+ 3.409 X 0.54
Q-STOCK	+ 0.832 X 1.68
$\Sigma\, b_i X_{ij}$	+ 1.634

Substituting into equation (1), we have:

$$\Pr(\text{POOLING}) = e^{+1.634} / (1 + e^{+1.634}) = 0.837.$$

Thus, we expect nearly 84 percent of mergers with the characteristics described to be poolings.

To identify the change in the probability of pooling associated with a change in some variable, the calculation must normally be repeated.

Suppose the acquisition is made instead for cash. In this case, the +1.268 value for STOCK is deducted, as is the Q-STOCK value of +0.832 X 1.68, and to the equation is added a Q-CASH value of -0.752 X 1.68. The new $\Sigma b_i X_{ij}$ = +1.634 - 1.268 - 1.398 - 1.263 = -2.295. Substituting this into equation (1), we obtain a probability of pooling of only 0.092. Marginally, the shift from stock to cash has reduced the probability of pooling from 0.837 to 0.092, or by 0.745. Clearly, the use of stock vs. cash makes a substantial difference.

Since this is a complex procedure, one may wish to use the short-cut method of estimating changes in the probability of pooling. The changes in $\Sigma b_i X_{ij}$ terms in going from stock to cash acquisition sum to 3.929 (i.e., the three last terms in the calculation leading to -2.295 above). These are multiplied by the approximation factor 0.2475 (last line of Table 1, column 1), derived by inserting into the partial derivative of equation (1) mean or median values of all relevant values. By this calculation, the reduced probability of pooling is -3.929 X 0.2475 = -0.972, which, because of the non-marginal magnitude of the changes, exaggerates somewhat the true probability decrease.

Table 2 provides another perspective on the interactions between time, consideration choice, and the size of premiums paid by the acquiring firm. Its sample is limited to the 1,409 acquisitions for which data on both acquired entity assets and consideration paid were available. In exchange for a smaller sample, each merger can have its own Q-value, now relabelled P-STOCK or P-CASH. For this richer data set, stock acquisitions exhibit a stronger and more consistent tendency toward pooling, and in addition, there is strong evidence that for such

acquisitions, as expected, pooling is more likely, the larger is the premium paid over book asset values. Surprisingly, the tendency to choose stock transaction accounting methods in a way that maximizes post-merger accounting earnings is stronger in the post-1970 period. This casts some doubt on the effectiveness of APB 16 in eliminating what was considered by many to be a significant abuse. For taxable all-cash acquisitions, the predicted negative premium relationship failed to materialize. Other relationships in Table 2 are similar to those of Table 1, except that the tendency toward purchase accounting on partial acquisitions is weaker, the dummy variable correcting for missing STOCK data cases is insignificant (probably because there are only 33 plugged data cases), and general company experience plays a somewhat weaker explanatory role.

The regressions of Table 2, like those of Table 1, show a trend toward increased use of pooling before 1970 and decreased use thereafter. Thus, they imply that APB 16 made the overall difference it was intended to make. However, an analysis of annual pooled merger percentages sows some seeds of doubt. The highest incidence of poolings (76 percent) was in 1968, with declines thereafter to 70 percent in 1969 and 65 percent in 1970, after which the declining trend continued to troughs of 31 percent in 1975 and 1976.

Is it possible that the concern over pooling leading to APB 16 induced behavioral changes even before formal regulatory corrections were implemented? Three further analyses were conducted in an attempt to locate the behavioral turning point more precisely, given possible changes over time in other choice-influencing variables. Because of the high cost

of nonlinear logit estimation procedures, all were performed using ordinary least squares.

In place of the dichotomous linear trend variables broken at 1970, a quadratic time trend variable was substituted. As expected, it had the shape of an inverted U. The peak was in 1967 -- before APB 16 appeared. Second, a "switching of regimes" approach was pursued, testing for the turning point at which the t-statistic on a broken linear trend variable had its highest value. The best fit for spliced linear trend variables, first positive and then negative, proved to be for 1970, although the differences relative to adjacent year turning points were slight and statistically insignificant. The differences in R^2 values between the regression with the best-fitting broken linear trend (peaking in 1970) and the quadratic trend (peaking in 1967) were minute -- the R^2 were 0.5049 and 0.5044 respectively. Finally, multiplicative dummy variables for the years 1965-73 were interacted with the linear trend values, and through the computation of an incremental F-ratio, the linearity restriction was tested. With $F(9, \infty)$ of 1.94 significant at the 0.05 level, the hypothesis that the time trends were of a simple segmented linear form is rejected. All in all, this sequence of tests suggests that the turning point may have preceded the initial disclosure draft and final approval of APB 16. However, because "nested hypothesis" problems are unavoidable in such switching of regimes tests, the statistical power of the tests is insufficient to be confident of this inference.

Conclusion

The purpose of the analysis reported here was both to illuminate and predict choices between purchase and pooling of interest accounting. As a predictor, the model performs well, achieving success on 84 percent of all acquisitions within the full manufacturing company sample and nearly 87 percent on the acquisitions for which both consideration paid and assets data were available. The analysis also shows that U.S. corporations' merger accounting choices conformed reasonably well to the prevailing "rules of the game" and that there were clear behavioral changes induced by, or at least accompanying, the establishment of new rules in 1970 through APB 16. However, both before and after 1970, regulation clearly did not eliminate all managerial discretion. Some APB 16 criteria (e.g., on mixed stock-cash acquisitions and subsequent divestitures) have little explanatory power. A large and indeed growing role is found for systematic inter-company policy differences. And for the smaller sample with complete consideration paid and asset data, the choice of accounting method was systematically influenced, both before and after 1970, by the size of premiums paid, which choices in turn affect post-merger earnings statements.

Table 1

Logit Regressions Predicting the Probability of Pooling of Interests Accounting: All Manufacturing Acquisitions

Variable Name	All Years	Pre-1970	Post-1970
Constant	-2.96**	-2.68**	-4.19*
	(3.26)	(2.35)	(1.90)
STOCK	1.268	0.748	5.854**
	(1.21)	(0.58)	(2.97)
STPLG*STOCK	-1.587**	-1.032**	-2.379**
	(8.65)	(4.68)	(5.81)
MIXED	-0.300	-1.501	1.685
	(0.32)	(1.28)	(0.92)
PARTIAL	-1.222**	-0.995**	-1.654**
	(5.01)	(3.12)	(3.47)
DIVEST	-0.177	-0.638	0.145
	(0.57)	(1.52)	(0.26)
RELSIZ	1.295**	1.704**	-1.022
	(4.22)	(4.62)	(0.87)
YEAR	0.0015	0.102**	-0.092*
	(0.19)	(7.53)	(2.11)
EXPER	3.409**	3.091**	4.234**
	(19.14)	(14.30)	(11.08)
EXPLG*EXPER	-0.387	-0.181	-0.217
	(1.25)	(0.49)	(0.32)
Q-STOCK	0.832**	0.152	-0.246
	(2.98)	(0.47)	(0.38)
Q-CASH	-0.752	-1.733*	0.996
	(1.25)	(2.24)	(0.90)
Number of observations	4,562	2,850	1,380
Correct predictions	84.2%	82.5%	86.7%
Approximation factor	0.2475	0.2346	0.2265

Likelihood ratio in test for homogeneity of coefficients between time periods = 112.5.

* Significant at the .05 level, ** at the .01 level

Table 2

Logit Regressions Predicting the Probability of Pooling of Interests Accounting: Acquisitions with Both Asset and Consideration Paid Data

Variable	All Years	Pre-1970	Post-1970
Constant	-3.488**	-4.747**	-0.301
	(7.85)	(7.21)	(0.19)
STOCK	2.973**	3.411**	2.459**
	(8.29)	(6.37)	(4.43)
STPLG*STOCK	0.101	0.738	-0.211
	(0.16)	(0.84)	(0.21)
MIXED	-0.085	-0.011	-0.654
	(0.16)	(0.01)	(0.58)
PARTIAL	-0.802*	-0.098	-2.320**
	(1.88)	(0.17)	(2.77)
DIVEST	0.159	0.210	0.664
	(0.23)	(0.17)	(0.72)
RELSIZ	0.887*	0.920*	-1.912
	(2.12)	(1.83)	(1.09)
YEAR	-0.027*	0.068**	-0.155**
	(1.94)	(2.61)	(2.50)
EXPER	2.995**	2.692**	3.289**
	(8.63)	(5.81)	(5.75)
EXPLG*EXPER	-0.579	-0.150	-1.287
	(1.00)	(0.20)	(1.24)
P-STOCK	0.792**	0.540**	1.020**
	(5.69)	(3.07)	(4.29)
P-CASH	0.116	0.244	0.059
	(0.75)	(0.91)	(0.27)
Number of observations	1,409	744	612
Correct predictions	86.7%	86.0%	88.1%
Approximation factor	0.2048	0.1762	0.2338

Likelihood ratio in test for homogeneity of coefficients between time periods = 34.8.

* Significant at the .05 level; ** at the .01 level.

FOOTNOTES

1. See especially Gagnon (1967), Gagnon (1971), Copeland and Wojdak (1969), Anderson and Louderback (1975), and Hong, Kaplan, and Mandelker (1978).

2. See Federal Trade Commission (1981-83).

3. For hard copies, Northwestern's library is now the best of the three, although the University of Illinois at Champaign-Urbana may have an even more comprehensive collection recently donated by Arthur Andersen & Co.

4. Excluded from the count are 44 "dirty poolings," 37 consummated before 1970 and the remainder in 1970.

5. We adopt the common terminology here, even though the index and its application to take-overs was first proposed by Robin Marris.

6. This ratio is biased downward relative to a correct measure of premiums because the data for consideration paid normally do not include the value of debt and other liabilities assumed. Despite this limitation, it was highly correlated with an alternate annual Tobin's Q index published by von Furstenberg (1977), with the denominator adjusted from replacement to book values using conversion ratios supplied by John Musgrave of the U.S. Commerce Department's Bureau of Economic Analysis.

7. For a 1-0 dummy variable, the mean indicates the relative frequency of the unit value's incidence. Thus, the mean for ACCTG reveals that 55.4 percent of the sample mergers were poolings. The means given here are for manufacturing acquisitions only. However, the plug values used were for both manufacturing and nonmanufacturing acquisitions.

8. See Amemiya (1981).

9. As indicated in the text, the analysis here focuses on manufacturing acquisitions only. Information was also collected on 1,374 mergers in which the acquired company's lines of business were in nonmanufacturing categories. Ordinary least squares regressions revealed that the manufacturing and nonmanufacturing samples were significantly different in their estimated coefficient values. In particular, the STOCK coefficient had an unexpected negative sign (significant at the .10 level) in the nonmanufacturing regression. Also, the Q-STOCK coefficient was much larger for nonmanufacturing acquisitions, and the RELSIZ variable had the wrong sign but was insignificant.

10. With 12 degrees of freedom, the .05 significance level value of the likelihood ratio is 21.0.

11. To be sure, this is a minimum estimate, since some of the "known" choices are probably classified wrongly, despite double- and sometimes triple-checking. Company disclosures were often ambiguous, especially during the 1950s, and sometimes accounting method changes were made after being announced, with only inconsistent disclosure of the changes.

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Appendix

Ordinary Least Squares Regression Results: All Manufacturing Acquisitions, All Years

Constant	-0.006 (0.07)
STOCK	0.347** (3.12)
STPLG*STOCK	-0.397** (16.15)
MIXED	-0.016 (0.17)
PARTIAL	-0.108** (4.66)
DIVEST	-0.020 (0.52)
RELSIZ	0.173** (5.00)
YEAR	0.0002 (0.22)
EXPER	0.455** (21.68)
EXPLG*EXPER	-0.059 (1.42)
Q-STOCK	0.122** (3.35)
Q-CASH	-0.064 (1.07)
Number of observations	4,562
R^2	0.498

T-ratios are given in subscripted parentheses.

* Significant at the .05 level in one-tail test.
** Significant at the .01 level in one-tail test.