

Public Regulation of the Securities Markets

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## PUBLIC REGULATION OF THE SECURITIES MARKETS\*

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IT IS doubtful whether any other type of public regulation of economic activity has been so widely admired as the regulation of the securities markets by the Securities and Exchange Commission. The purpose of this regulation is to increase the portion of truth in the world and to prevent or punish fraud, and who can defend ignorance or fraud? The Commission has led a scandal-free life as federal regulatory bodies go. It has been essentially a "technical" body, and has enjoyed the friendship, or at least avoided the enmity, of both political parties.

The *Report of the Special Study of the Securities Markets*, which was recently released, is itself symptomatic of the privileged atmosphere within which the S.E.C. dwells.<sup>1</sup> This study investigated the adequacy of the controls over the security markets now exercised by the S.E.C. The study was well endowed: it was directed by an experienced attorney,

\* I wish to disclose my obligation to Claire Friedland for performing the statistical work.

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<sup>1</sup> *Report of the Special Study of the Securities Markets of the Securities and Exchange Commission* (88th Cong., 1st sess., House Document 95, 1963 [Washington, D.C.: Government Printing Office, 1963]), Part I. All citations in text to part, chapter, or page refer to this work.

Milton H. Cohen; it had a professional staff of more than thirty people; and it operated on a schedule that was leisurely by Washington standards. The study was not an instrument of some self-serving group, nor was it even seriously limited by positions taken by the Administration. Such a professional, disinterested appraisal would not even be conceivable for agricultural or merchant marine or petroleum policy, or the other major areas of public regulation. Disinterest, good will, and money had all joined to improve the capital markets of America.

The regulation of the securities markets is therefore an appropriately anti-septic area in which to see how public policy is formed. Here we should be able to observe past policy appraised, and new policy defended, on an intellectually respectable level, if ever it is.

We begin with an examination of certain of the *Special Study's* policy proposals. Cohen presents a vast number of recommendations of changes in institutions and practices. Most are minor, and some are even frivolous (market letters should not predict specific price levels of stocks). The content of the proposals, however, is not our present concern; what is our concern is the manner in

which the proposals are reached. More specifically: (1) How does the Cohen Report show that an existing practice or institution is defective? (2) How does the Cohen Report show that the changes it recommends (*a*) will improve the situation, and (*b*) are better in some sense than alternative proposals? In answering these questions I shall use the discussion of the qualifications of brokers and other personnel in the industry (chap. ii), although the numerous other areas would do quite as well.

### 1. THE FORMULATION OF POLICY

The Cohen Report tells us that there is cause for dissatisfaction with the personnel of the industry: "From the evidence gathered by the study, it appears that the existing controls have proven to be deficient in some important regards. The dishonest broker-dealer, that 'greatest menace to the public,' to use the words of one Commission official, continues to appear with *unjustifiable frequency*. Also, the inexperienced broker-dealer *too often* blunders into problems for himself, his customers, and the regulatory agencies."<sup>2</sup> So there are too many thieves and too many incompetents.

How does Cohen prove that there are enough thieves and incompetents to justify more stringent controls? After all, one can always find some dishonest and untutored men in a group of 100,000; not all the angels in heaven have good posture.

The "proof" of the need for further regulatory measures consists basically and almost exclusively of four case studies. These studies briefly describe four new firms with relatively inexperienced salesmen who were caught in falling markets and in three cases became bankrupt

<sup>2</sup> *Ibid.*, p. 51. (My italics.)

or withdrew from the business. No estimates of losses to customers are made. The studies were handpicked to emphasize the shortcomings of *new* firms, because this is the place where Cohen wishes to impose new controls. The studies are of course worthless as a proof of the need for new policies: nothing Cohen, the S.E.C., or the United States government can do will make it difficult to find four more cases at any time one looks for them.

Cohen's second, and only other, piece of evidence, is a survey of disciplinary actions against members of the NASD (National Association of Security Dealers) from 1959 through 1961. To quote the report: "The results of this analysis revealed that the association's newest member firms, which are generally controlled by persons having less experience than principals of older firms, were responsible for a heavy preponderance of the offenses drawing the most severe penalties" (Part I, p. 66). Cohen's summary of the statistical study, of which this sentence is a fair sample, would not meet academic standards of accuracy. The study reveals that of 1,014 firms founded before 1941, 223 were involved in disciplinary proceedings between 1959 and 1961; of 1,072 firms founded in 1959-60, only 103 were involved in such proceedings. The data are poorly tabulated (dismissals are included, and duplicate charges against one firm are counted as several firms), but however viewed they do not make a case for the need for more regulation, or for more severe screening of new entrants.<sup>3</sup> Yet Cohen believes

<sup>3</sup> The *Report* discusses only the higher rate of use of expulsion as a penalty against younger firms. The *Report* does not relate sanctions to violations, so the interpretation of heavier penalties is obscure, even if the more lenient enforcement against older firms remarked upon by the *Report* is waived.

that the basis has been laid for his main finding:

The large number of new investors and new broker-dealer firms and salesmen attracted to the securities industry in recent years have combined to create a problem of major dimensions. . . .

More than a generation of experience with the Federal securities laws has demonstrated, moreover, that it is impossible to regulate effectively the conduct of those in the securities industry, unless would-be members are adequately screened at the point of entry [Part I, p. 150].

These alleged findings lead to a series of policy proposals, such as the following:

1. All brokers should be compelled to join "self-regulatory" agencies (such as the NASD).
2. No one who has been convicted of embezzlement, fraud, or theft should be allowed in the industry for ten years thereafter.
3. A good character should be required for entrants.
4. Examinations should be required for prospective entrants.

The *Report* approves strongly of the six-month training period now required of customers' men in firms belonging to the New York Stock Exchange (NYSE).

Cohen believes that the people dealing in securities with the public should have extensive training and screening such as his own profession requires. My lengthy experience with "account executives" of major NYSE firms has not uncovered knowledge beyond what would fit comfortably into a six-hour course. It would have been most useful if Cohen had investigated the experience of customers of a randomly chosen set of account men with diverse amounts of training and experience: Have differences in experience or training had any effect on the profits of their customers? But he never even dreamed of the possibility—or perhaps it was of the need—of pretesting his proposals.

The report takes for granted not only the effectiveness but also, what is truly remarkable, the infallibility of the regulating process:

There is no evidence that these practices are typical . . . but regardless of their frequency they represent problems too important to be ignored [Part I, p. 268].

The mere fact that there have been any losses at all is sufficient reason to consider whether there are further adjustments that should be made for the protection of investors [Part I, p. 400].

Observe: no matter how infrequent or trivial the damage to investors, the regulatory process must seek to eliminate it (no doubt inexpensively). Surely rhetoric has replaced reason at this point.

As for alternative methods of dealing with the problem of fraud, only one is mentioned: "A number of persons have suggested that a Federal fidelity or surety bond requirement be imposed in addition to or in lieu of a capital requirement. It would seem, however, that such a requirement would present a number of practical difficulties and that more significant protection to the public can be assured through a Federal net capital requirement. No recommendation as to bonding, therefore, will be made at this time" (Part I, p. 92). I must confess to being shocked by this passage. A number of "practical difficulties" exclude the sensible, direct, efficient way to deal with the problem of financial responsibility—difficulties so obvious and conclusive they do not even need to be mentioned.

When one looks at a well-built theater set from the angle at which the audience is to view it, it appears solid and convincing. When one looks from another direction, it is a set of two-dimensional pieces of cardboard and canvas, which could not possibly create an illusion of validity. So it is with the Cohen Report. Once we

ask for the evidence for its policy proposals, the immense enterprise becomes a promiscuous collection of conventional beliefs and personal prejudices.

## 2. A TEST OF PREVIOUS REGULATION

A proposal of public policy, everyone should agree, is open to criticism if it omits a showing that the proposal will serve its announced goal. Yet the proposal may be a desirable and opportune one, and the inadequacies of a proposer are no proof of the undesirability of the proposal. And—to leave the terrain of abstract and unctious truth—the past work of the S.E.C. and Cohen's schemes for its future may serve fine purposes even though no statistician has measured these probable achievements. Quite so. But then again, perhaps not.

The paramount goal of the regulations in the security markets is to protect the innocent (but avaricious) investor. A partial test of the effects of the S.E.C. on investors' fortunes will help to answer the question of whether testing a policy's effectiveness is an academic scruple or a genuine need. This partial test will serve also to illustrate the kind of study that should have occupied the *Special Study*.

The basic test is simplicity itself: how did investors fare before and after the S.E.C. was given control over the registration of new issues? We take all the new issues of industrial stocks with a value exceeding \$2.5 million in 1923–28, and exceeding \$5 million in 1949–55, and measure the values of these issues (compared to their offering price) in five subsequent years. It is obviously improper to credit or blame the S.E.C. for the absolute differences between the periods in investors' fortunes, but if we measure stock prices relative to the market average, we shall have eliminated most of the effects of general market conditions. The

price ratios ( $p_t/p_0$ ) for each time span are divided by the ratio of the market average for the same period. Thus if from 1926 to 1928 a common stock rose from \$20 to \$30, the price ratio is 150 (per cent) or an increase of 50 per cent but, relative to the market, which rose by 68.5 per cent over this two-year period, the new issue fell 12 per cent.<sup>4</sup>

The prices of common and preferred stocks were first analyzed to determine whether they varied with size of issue after one, three, or five years. In each case there was no systematic or statistically significant variation of price with size of issue. The elusiveness of quotations on small issues makes it difficult to answer this question for issues smaller than the minimum size of our samples (\$2.5 million in the 1920's, \$5 million in the 1950's). One small sample was made of fifteen issues in 1923 of \$500 thousand to \$1 million for which quotations were available, and this was compared with the twenty-two larger issues of the same year. The differences were sufficient to leave open the question of the representativeness of our findings for smaller issues.<sup>5</sup>

The annual averages of the quotations (relative to market) are given for common stocks in Table 1. In both periods it was an unwise man who bought new issues of common stock: he lost about one-fifth of his investment in the first year relative to the market, and another

<sup>4</sup> The data are more fully described in the Appendix.

<sup>5</sup> The preferred stocks had almost identical means in the large and small samples, but the small common stock issues had much lower prices than the large issues for the first three years, after which they were essentially equal to those of the large issues. But only the first-year price relatives differed significantly at the 5 per cent level with the small samples available. There were no systematic differences in the variances of the price relatives of large and small issues.

fifth in the years that followed. The data reveal no risk aversion.

The averages for the two periods reveal no difference in values after one year, and no significant difference after two years, but a significant difference in the third and fourth, but not fifth, years. The ambiguity in this pattern arises chiefly because the issues of 1928 did quite poorly,

is difficult to specify: presumably it is equal to the average period the purchasers held the new issues. With speculative new issues one would expect the one-year period to be much the most relevant, for thereafter the information provided by this year of experience would become an important determinant of the investor's behavior.

TABLE 1  
NEW STOCK PRICES RELATIVE TO MARKET AVERAGES, COMMON STOCKS  
(Issue Year = 100)

	YEAR AFTER ISSUE				
	1	2	3	4	5
Pre-S.E.C.:					
1923.....	92.7	85.0	77.8	62.1	67.0
1924.....	98.0	76.3	69.1	65.9	51.0
1925.....	85.0	66.9	54.8	42.2	33.0
1926.....	90.2	81.8	77.1	62.6	66.9
1927.....	84.7	69.1	60.1	72.6	103.4
1928.....	71.6	50.4	40.8	45.0	57.0
Average.....	81.9	65.1	56.2	52.8	58.5
Standard deviation.....	43.7	46.7	43.7	48.5	65.1
No. of issues.....	84	87	88	85	84
Post-S.E.C.:					
1949.....	93.3	88.1	86.7	86.9	64.9
1950.....	84.3	76.0	53.0	57.8	46.9
1951.....	83.6	78.7	76.3	80.4	74.5
1952.....	87.7	74.3	70.7	70.4	69.8
1953.....	88.1	79.2	75.4	70.4	93.6
1954.....	53.2	48.7	56.4	48.1	42.4
1955.....	71.8	64.9	82.3	77.8	83.4
Average.....	81.6	73.3	72.6	71.9	69.6
Standard deviation.....	23.9	27.7	31.0	30.9	38.9
No. of issues.....	47	47	47	47	47

and the number of issues in this year was relatively large—one-third of all issues of the 1920's were made in 1928. It may well be that these enterprises did not have sufficient time to become well launched before the beginning of the Great Depression. With an unweighted average of the various years, there would be no significant difference between the averages in the 1920's and the 1950's.

The proper period over which to "hold" a new stock in these comparisons

These comparisons suggest that the investors in common stocks in the 1950's did little better than in the 1920's, indeed clearly no better if they held the securities only one or two years. This comparison is incomplete in that dividends are omitted from our reckoning, although this is probably a minor omission and may well work in favor of the 1920's.<sup>6</sup>

<sup>6</sup> An estimate of the role of dividends for two years in each period was made as follows: The aggregate dividends received on stocks issued in 1923



The variance of the price ratios, however, was much larger in the 1920's than in the later period: in every year the difference between periods was significant at the 1 per cent level, and in four years at the 0.1 per cent level. This is a most puzzling finding: the simple-minded interpretation is that the S.E.C. has succeeded in eliminating both unusually good and unusually bad new issues! This is difficult to believe as a matter of either intent or accident. A more plausible explanation lies in the fact that many more new companies used the market in the 1920's than in the 1950's—from one viewpoint a major effect of the S.E.C. was to exclude new companies.<sup>7</sup>

The preferred stocks, which were far more numerous than the common stocks in the 1920's, pose a special problem. We use the market average as the base for measuring investor experience in order to minimize the influence of other

and 1924, and in 1950 and 1951, are expressed as rates of return on the initial costs to investors of the issues:

RATE OF RETURN ON INITIAL COST					
Year and Type of Issue	1924 <sup>a</sup>	1925	1926	1927	1928
1923-24:					
Preferred.....	7.11	7.10	6.77	6.50	6.30
Common.....	7.11	6.16	6.56	6.77	7.62

Year and Type of Issue	1951 <sup>b</sup>	1952	1953	1954	1955
1950-51:					
Preferred.....	6.89	4.78	4.81	4.86	4.81
Common.....	1.62	4.17	4.11	4.08	4.26

<sup>a</sup> 1923 issues only.

<sup>b</sup> 1950 issues only.

This sample suggests that dividends were a larger component of return in the 1920's.

<sup>7</sup> Of twenty-six issues of common stock in 1949-54, only six were by companies less than three years old; the corresponding figure for 1923-27 was thirty-eight less than three years old of a total of fifty-three issues.

factors, but no such market average exists for preferred stocks. The existing preferred stock indexes are actually indexes of the yields of preferred stocks, and exclude defaults or failures, so they do not measure the fortunes of investors in preferred stocks.

The price relatives for preferred stocks are given in Table 2, and it will be observed that the break in the market in 1929 had a decisive influence on the absolute values of these issues. We may in fact summarize the salient numbers:

YEAR OF ISSUE	AVERAGE PRICE RELATIVE	
	1929	1930
1925.....	107.2	78.6
1926.....	94.7	85.7
1927.....	97.8	91.7
1928.....	93.7	69.7

As a result of this heavy impact, the price relatives are substantially lower after two years in the 1920's than in the 1950's.

Accordingly we need a deflator, and again use the common stock index (Table 3). The common stock index seems more appropriate than the unsatisfactory preferred stock indexes, especially since most of the recent preferred issues were convertible.<sup>8</sup> The average experience, on this basis, was superior in the 1950's for the first two years after an issue was purchased; thereafter there was no difference.

The undeflated preferred stock experience is the same in both periods for the first two years, and the deflated experience is the same in both periods for the last three years; the opposite indexes show a superior performance in the 1950's.

<sup>8</sup> In the 1920's, thirty-six of 121 issues were convertible and in the 1950's twenty-eight of forty issues were convertible.

TABLE 2  
NEW STOCK PRICES RELATIVE TO ISSUE YEAR, PREFERRED STOCKS

	YEAR AFTER ISSUE				
	1	2	3	4	5
Pre-S.E.C.:					
1923.....	95.3	96.9	92.0	97.6	96.2
1924.....	84.6	71.2	72.9	71.9	56.3
1925.....	107.6	108.3	118.4	107.2	78.6
1926.....	101.1	96.2	94.7	85.7	60.5
1927.....	101.4	97.8	91.7	63.0	44.6
1928.....	93.7	69.7	50.0	29.9	31.9
Average.....	97.8	87.0	79.1	65.0	53.2
Standard deviation.....	20.4	33.4	45.1	53.7	50.3
No. of issues.....	110	115	117	111	108
Post-S.E.C.:					
1949.....	112.3	101.7	101.1	97.7	105.2
1950.....	99.6	96.5	97.5	103.9	105.7
1951.....	101.1	94.3	101.8	108.8	113.1
1952.....	95.7	93.6	113.2	95.0	91.2
1953.....	148.1	117.6	119.5	104.5	n.a.
1954.....	112.1	102.7	88.5	77.3	88.3
1955.....	103.6	102.0	109.2	190.5	205.7
Average.....	107.1	99.0	102.0	107.7	114.3
Standard deviation.....	18.6	13.7	20.2	51.8	66.5
No. of issues.....	40	38	36	33	29

TABLE 3  
NEW STOCK PRICES RELATIVE TO MARKET AVERAGES, PREFERRED STOCKS  
(Issue Year = 100)

	YEAR AFTER ISSUE				
	1	2	3	4	5
Pre-SEC:					
1923.....	91.2	72.9	60.0	50.9	37.2
1924.....	66.5	48.4	39.7	29.0	18.0
1925.....	93.1	75.1	60.8	43.6	41.6
1926.....	81.0	57.1	44.5	52.4	57.7
1927.....	75.1	57.4	70.0	75.1	104.0
1928.....	74.2	71.8	80.6	94.4	70.9
Average.....	79.2	66.6	66.9	69.7	65.3
Standard deviation.....	17.4	24.9	40.0	65.9	42.0
No. of issues.....	110	115	117	111	108
Post-S.E.C.:					
1949.....	91.9	67.2	61.2	59.0	52.2
1950.....	80.5	71.4	62.8	63.0	45.7
1951.....	92.5	86.1	76.3	58.2	51.5
1952.....	95.5	76.7	66.2	47.3	47.4
1953.....	121.6	68.9	59.6	54.5	n.a.
1954.....	79.9	62.4	56.2	47.4	43.5
1955.....	88.2	90.8	93.8	131.4	146.8
Average.....	91.5	76.9	69.6	62.2	59.0
Standard deviation.....	15.2	14.0	13.6	37.2	49.3
No. of issues.....	40	38	36	33	29



This combination of results suggests that our deflators are inappropriate, and we can only repeat our lament at the absence of a relevant preferred-stock index.

Since convertibility is much more common in the later issues, there is an argument for comparing the earlier issues to the base year, and the later issues to the common stock index. The average period these new issues are held may also be longer than common stocks are held. These various considerations combine to suggest that the preferred-stock performance was not significantly better in the 1950's than in the 1920's.

These studies suggest that the S.E.C. registration requirements had no important effect on the quality of new securities sold to the public. A fuller statistical study—extending to lower sizes of issues and dividend records—should serve to confirm or qualify this conclusion, but it is improbable that the qualification will be large, simply because the issues here included account for most of the dollar volume of industrial stocks issued in these periods. Our study is not exhaustive in another sense: we could investigate the changing industrial composition of new issues and other possible sources of differences in the market performance of new issues in the two periods.

But these admissions of the possibility of closer analysis can be made after any empirical study. They do not affect our two main conclusions: (1) it is possible to study the effects of public policies, and not merely to assume that they exist and are beneficial, and (2) grave doubts exist whether if account is taken of costs of regulation,<sup>9</sup> the S.E.C. has saved the purchasers of new issues one dollar.

<sup>9</sup> The costs of the program, that is, probably exceed even a reasonably optimistic estimate of benefits. Costs of flotations due to registration have apparently never been estimated even approximate-

### 3. THE CRITERIA OF MARKET EFFICIENCY

So far as the efficiency and growth of the American economy are concerned, efficient capital markets are even more important than the protection of investors—in fact efficient capital markets *are* the major protection of investors. The *Special Study* devotes considerable attention to the mechanism of the most important single market, the New York Stock Exchange.

One can ask whether this market is competitively organized: are the prices of brokers' services set by competitive forces? The answer is clearly in the negative and the Cohen Report is properly critical of the structure of commissions of the NYSE, which is highly discriminatory against higher-priced stocks and larger transactions. The *Report* explicitly refrains from discussing the compulsory minimum rates set by this self-regulating cartel. The reason for silence is obscure: the present scheme of compulsory private price-fixing of brokers' services seems to me wholly objectionable. The replacement of cartel pricing by competition, with review lodged in the Antitrust Division, would confer larger benefits upon investors than the S.E.C. has yet provided.

The mechanism of response to changing conditions is a more subtle matter, dealt with especially in chapter vi ("Exchange Markets") of the *Special Study*. The task of providing continuity and orderliness of markets in specific stocks is now performed by the specialists, aided or observed (as the case may be) by the

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ly; the S.E.C. data (e.g., *Cost of Flotations, 1945-49*) exclude costs included in commissions of underwriters and costs of the delays imposed by the process, as well as costs of operating the S.E.C. The full costs of registration for new stock issues could be 5 per cent of their value.

floor traders. How well do they presently perform their tasks?

1. The NYSE uses a "tick test" of the effects of specialists on short-run price fluctuations. If a transaction takes place below the last different price, it is called a minus tick, and if above the last different price, it is a plus tick. Purchases on minus ticks and sales on plus ticks are considered stabilizing, and in three sample weeks, 83.9 per cent of specialists' transactions were of this type. The *Special Study* rejects this test on two grounds:

1. "A tick by itself does not necessarily represent a change in the public's evaluation of the security." Thus, after a transaction at 35, the specialists will often offer  $34\frac{1}{2}$  and ask  $35\frac{1}{2}$ , and a transaction at either price is a so-called stabilizing tick. This represents "only a random sequence of buy and sell orders."
2. The specialists' own profit incentive is to buy low and sell high—and presumably (but the *Special Study* does not say explicitly) no virtue attaches to profitable activity.<sup>10</sup>

The *Special Study* demands that the test be applied to a longer sequence of transactions; on individual pairs of transactions the test "can be expected to reveal only cases of grossly destabilizing activity."<sup>11</sup> Specialists engage in only a third of all transactions, but as a rule at least one-third of the ticks in a stock are negative and one-third positive in a day. Hence the specialists could foster market movements while appearing to stabilize them, or so the Report argues. Thus if the specialist sells in the underlined transactions in the following sequence:

35 34  $34\frac{3}{4}$  34  $34\frac{1}{2}$   $33\frac{3}{4}$  34,

he is stabilizing by the tick test while riding with a market trend. This presci-

<sup>10</sup> *Special Study*, Part II, pp. 102-3.

<sup>11</sup> *Ibid.*, p. 104.

ent behavior is not documented, nor is a specific tick test proposed.

2. The preferred test of the specialist's effect is how his inventory of stock varies as the market price fluctuates: "That is, a member trading pattern which tends to produce purchase balances on declining stock days and sales balances on rising stock days would indicate that members exert a stabilizing influence on the stock days in which they traded" (Part II, p. 55). An analysis is made of changes in specialists' stock inventories on four days. In each case inventories moved with the market—that is, they were destabilizing. But if the analysis is performed on stocks classified as rising or falling, balances moved in a stabilizing fashion in seven of the eight cases (Part 2, p. 108). But *within* these eight groups there were a substantial number of cases in which inventories of stocks moved with the market, so specialist performance left something to be desired. Cohen's standards have not flagged: he expects every specialist to do, not his best, but perfectly.<sup>12</sup>

The economist will have observed that the *Report* has no theory of markets from which valid criteria can be deduced by which to judge experience. The tick test and the "offsetting balances" tests are both lacking of any logical basis: these tests assume that smoothness of price movement is the sign of an efficient

<sup>12</sup> The *Special Study* shows particular concern with the specialist who "reaches across" the market, i.e., who initiates transactions by buying stock at the offer or selling at the bid, instead of waiting for someone to trade. This alarm again reflects the Study's identification of the specialist's proper role with strict price stabilization. Suppose the bid is 30 and the ask  $30\frac{1}{2}$ , and the specialist anticipates that the market will soon go to  $32-32\frac{1}{2}$ . He buys at  $30\frac{1}{2}$  so the effective ask becomes (say)  $30\frac{3}{4}$ . He has initiated a price move, but one called for by his function of achieving equilibrium, if his anticipation is correct.

market, and it is not. Let us sketch the problem of an efficient market.

The basic function a market serves is to bring buyers and sellers together. If there were a large number of people who sent their bid and ask prices to a single point (market), we should in effect observe the supply and demand functions of elementary economic theory. *The* price that cleared this market would be established—it would be a unique price if there were sufficient traders to produce

TABLE 4

TURNOVER RATES OF 100 STOCKS ON THE NEW YORK STOCK EXCHANGE, MARCH, 1961

Value of Issue (Millions of Dollars)	No. of Stocks	Ratio of Shares Traded to Total Outstanding
Under 5.....	9	0.012
5-10.....	12	.026
10-25.....	18	.037
25-50.....	10	.043
50-75.....	11	.073
75-100.....	12	.034
100-250.....	13	.027
250-500.....	8	.029
500 and over.....	7	0.008

continuity of supply and demand functions—and trading would stop.

This once-for-all, or at most once-per-period, market differs from most real markets in which new potential buyers and sellers are appearing more or less irregularly over time. Existing holders of a stock wish to sell it—at a price—to build a home, marry off a daughter, or buy another security which has (for them) greater promise. Existing holders of cash wish to buy the stock, at a price. Neither group is fully identified until after the event: I would become a bidder for a stock that does not fall within my present investment horizon provided that its price falls for reasons which I believe are mistaken.

So demand and supply are flows, and erratic flows with sequences of bids and asks dependent upon the random circumstances of individual traders. As a first approximation, one would expect the number of holders of a security to be proportional to the total value of the issue. Then the numbers of bids, offers, and transactions would also be proportional to the dollar size of the issue. This is roughly true: the turnover rate of a random sample of one hundred stocks in one month is classified by the total value of the issues, in Table 4, and only in very small and very large issues was there a considerable departure from proportionality.<sup>13</sup>

Let us take a very primitive model of a random sequence of bids and asks, and see what this sequence implies for (1) the level of transaction prices, and (2) the time until a bid or ask is met and a transaction occurs. We start with a demand schedule (Table 5) for a given stock of which 710,000 shares are outstanding, so the equilibrium price is between  $29\frac{3}{4}$  and 30. A sequence of bids and asks now appears. They are truly random: two-digit numbers from a table of random numbers are drawn, and the first digit determines whether it is a bid or ask (even or odd, respectively) and the

<sup>13</sup> Of course, the frequency of transactions depends upon the size of the individual transactions, but this is not closely correlated with frequency. A short sequence of the transactions of the NYSE was tabulated for November 5, 1963:

No. of Transactions	No. of Stock Issues	Average Transaction Size (Shares)
1.....	264	225
2.....	97	181
3.....	51	199
4.....	30	190
5.....	13	192
6.....	12	303
7.....	3	200
8.....	3	196
9.....	3	144
12-16.....	9	172
18-67.....	3	236

second digit determines the level of the bid or ask (0-9, or, in market price units,  $28\frac{3}{4}$ -31). (This uniform distribution is replaced by a normal distribution later, but it suffices for the present.) The sequence of random numbers (here called "tenders") proceeds:

- (1) 28: a bid (2 is even) of 8 ( $= 30\frac{3}{4}$ ),  
 (2) 30: an ask (3 is odd) of 0 ( $= 29\frac{3}{4}$ ),

Here a transaction occurs at  $30\frac{3}{4}$  because this highest outstanding bid exceeds the seller's minimum ask. To proceed:

- (3) 95: an ask of 5,  
 (4) 01: a bid of 1,  
 (5) 10: an ask of 0.

This last trader sells at 1(= 29) to the fourth tender. The process continues, with the further rule that any unfulfilled bids or asks are cancelled after twenty-five numbers. The transaction price and the minimum unfulfilled asking price and maximum unfulfilled bid are shown in Figure 1.

The transaction prices fluctuate substantially, as will be seen—indeed the mean absolute deviation from the equilibrium price (taken as the closer of  $29\frac{3}{4}$  or 30) is \$0.34, or 34 per cent of the maximum possible absolute deviation. The average delay in fulfilling a bid or ask is 3.8 units of (tenders).<sup>14</sup> These particular results depend upon the special distribution of bids and asks we assume, but any reasonable distribution will generate significant fluctuations in price and significant and erratic delays in filling bids or asks.

<sup>14</sup> This delay is the average of 7.59 units for the earlier tender plus zero units for the tender that makes a transaction. If we include bids or asks cancelled after twenty-five time units, the average delay is 8.04 units—perhaps a half-hour for an active stock, a week or a month for an inactive stock.

The time unit involved in the foregoing analysis is the interval between successive bids or asks. If tenders are proportional to transactions, and the latter to dollar size of issue, this time unit will be inversely proportional to the size of issue. The time unit will be roughly 1/1,000 as long for American Telephone and Telegraph as for Oklahoma Gas and Electric common. In addition the effective price unit for trading may be  $\frac{1}{4}$  or  $\frac{1}{2}$  dollar for the less active stock where it is  $\frac{1}{8}$  for the active stock.

In addition to allowing buyers and sellers to deal with one another, an effi-

TABLE 5  
DEMAND SCHEDULE FOR  
A SECURITY

	Price	Aggregate Demand
$28\frac{3}{4}$ (0)	.....	800,000
29 (1)	.....	780,000
$29\frac{1}{4}$ (2)	.....	760,000
$29\frac{1}{2}$ (3)	.....	740,000
$29\frac{3}{4}$ (4)	.....	720,000
30 (5)	.....	700,000
$30\frac{1}{4}$ (6)	.....	680,000
$30\frac{1}{2}$ (7)	.....	660,000
$30\frac{3}{4}$ (8)	.....	640,000
31 (9)	.....	620,000

cient market is commonly expected to display the property of resilience (to use an unfamiliar word for a property whose absence is called "thinness"). Resilience is the ability to absorb *market* bid or ask orders (i.e., without a price limit) without an appreciable fluctuation in price. No market can absorb vast orders without large price changes, so this condition must be interpreted as follows: market buy and sell orders of a magnitude consistent with random fluctuation in tenders with an unchanging equilibrium price should not change the transaction prices appreciably.

The reason for making resilience a property of efficient markets may be

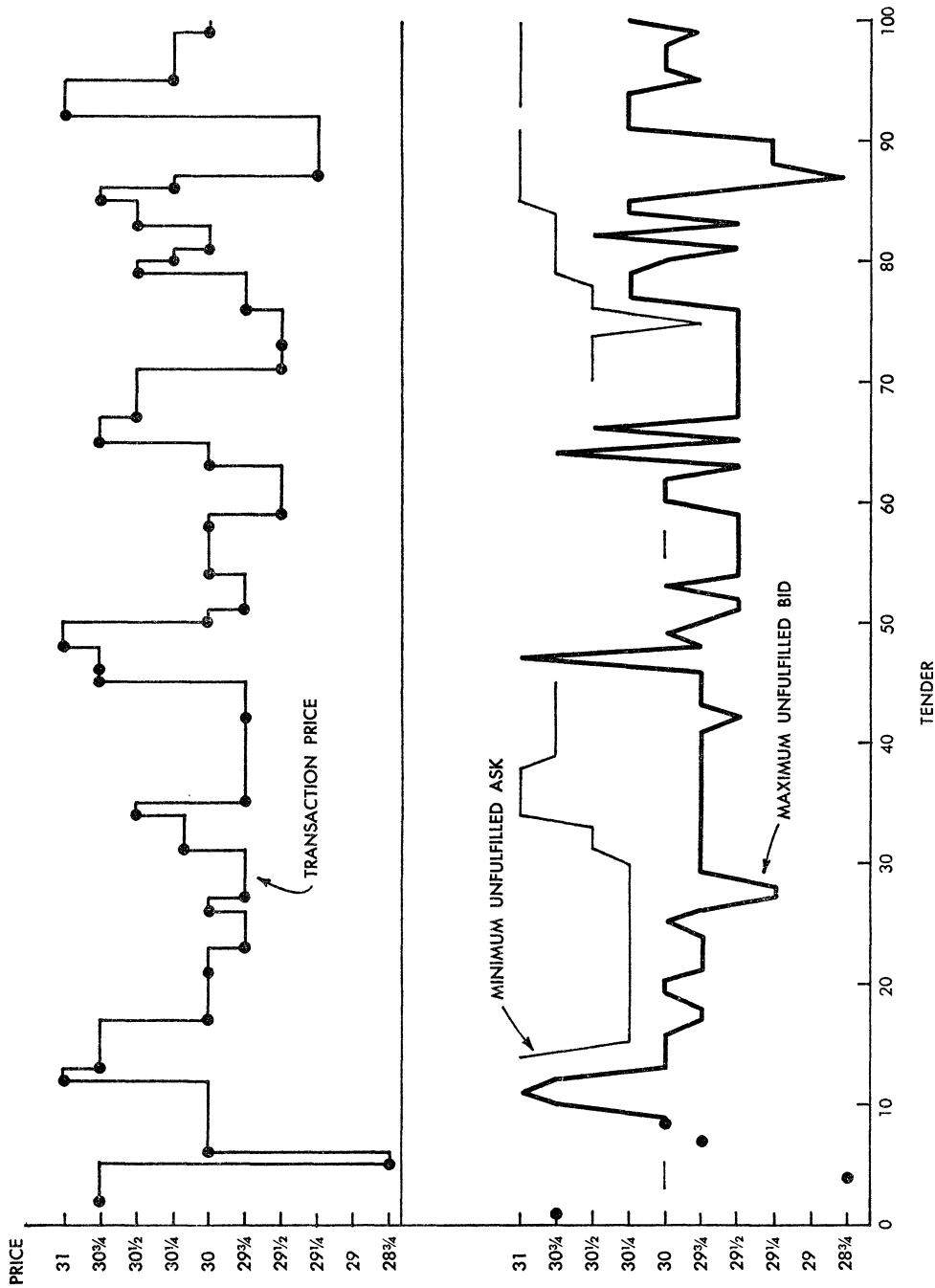


Fig. 1.—Hypothetical sequence of transaction prices, generated by sequence of random numbers, and maximum unfulfilled bid and minimum unfulfilled ask prices (equilibrium price of  $29\frac{3}{4}$  or 30).



approached through an analogy. If in a geographical area prices of a product differ, in response to random demand changes, by more than transportation costs, we say that the allocation of the product will be inefficient: A will buy the good for \$6 when B is unable to obtain it for \$7 (including transportation costs). Alternatively, the owners of the good are not maximizing its value.

Similarly, if random fluctuations in price—under our assumed condition of a stable equilibrium price—lead to price changes greater than inventory carrying costs (the cost of transporting a security from one date to another), the allocation of the product will be inefficient among buyers. Alternatively, the sellers are not maximizing the value of their holdings.

If access to the market is free, speculators will appear to provide resilience by carrying inventories of the stock; they are in fact primarily the specialists of the NYSE plus the floor traders. The speculators will charge the cost of carrying inventories and of their personal services by the bid-ask spread they establish, and in competitive equilibrium this spread will be just remunerative of these trading costs. The technical efficiency with which this inventory management is conducted will be measured by the spread between bid and ask prices.

In addition there are costs of the provision of the machinery of exchange, and these are also part of the cost of transactions. The performance of the main function of the exchange as a market place is subject to economies of scale. The greater the number of transactions in a security concentrated in one exchange, the smaller the discontinuities in trading and the smaller the necessary inventories of securities. As a result the price of a security will almost invariably be “made” in one exchange.

Specialists would then alter the price pattern of Figure 1 by setting fixed bid and ask prices (under the present assumption of fixed supply and demand conditions). They will offer to buy all shares at, say,  $29\frac{3}{4}$  and sell to all buyers at 30, and the difference (the “jobber’s turn”) will be the compensation for the costs of acting as a specialist.<sup>15</sup>

To summarize: the efficient market under stationary conditions of supply and demand has the properties:

1. If a bid equals or exceeds the lowest asking price (and similarly for offers), a transaction takes place
2. Higher bids are fulfilled before lower bids, and conversely for offers
3. Prices will fluctuate only within the limits of speculator’s costs of providing a market (under competition).

In this regime the cost of transactions (half the bid-ask spread plus commissions) will be the complete inverse measure of the efficiency of the markets. Bid and ask prices will be (almost) constant through time.<sup>16</sup>

<sup>15</sup> Specialists affect our model in the following ways: (1) the bid of  $29\frac{3}{4}$  effectively eliminates all offers by non-dealers at less than  $29\frac{3}{4}$ , so the frequency distribution of offers now ranges from  $29\frac{3}{4}$  to 31, with the lowest offer arising  $\frac{1}{2}$  of the time on average; (2) the offer of 20 effectively eliminates all bids by non-dealers at more than 30, with similar consequences.

<sup>16</sup> In the absence of specialists, the gains or losses of buyers measured from an expected price of  $29\frac{7}{8}$  were exactly offset by the corresponding losses or gains for sellers. (We ignore commissions, which will be the same with or without specialists, at least as a first approximation.) The parties now lose the jobber’s “turn” of (say)  $\frac{1}{2}$ , which is the price they pay for one of two things: (1) immediate availability of a buyer or seller; (2) the elimination of short run fluctuations in price. These two gains are analytically one: there is always an available buyer at a low enough price, and an available seller at a high enough price, so the gain of immediate marketability is at a price which contains no random elements. (Strictly speaking, we should say a price with much reduced random elements. The specialists’ inventory will be exhausted from time to time when unusually long runs of bids or asks arise, since



Let us consider now the formidable task of real markets, in which the equilibrium price changes without precise or advance notice. We illustrate the characteristic price patterns in the absence of speculation with Figures 2 and 3. The sequences of bids, asks, and transaction prices follow the procedure of Figure 1 with four changes:

1. The random numbers are normally distributed (with  $\sigma = \$1.00$ )
2. In Figure 2 the equilibrium price is dropped from \$25.00 to \$23.75 after 50 tenders
3. In Figure 3 the equilibrium price begins a linear upward trend of 5 cents per tender after 25 tenders
4. No tenders are cancelled because of staleness.

In each case, after the equilibrium changes the unfulfilled tenders are alternatively (1) retained, and (2) changed by the amount of the change in the equilibrium price—the two alternatives bracket the most reasonable assumptions. If the reader will compare the equilibrium prices with the observed sequences he will better appreciate the task of the specialist in detecting true changes and avoiding false changes in the equilibrium price (= population value).

If the impacts on equilibrium are sudden and unexpected—as in the examples underlying Figure 2—the appropriate market response is an immediate and complete shift to the new price level. Under this condition the demand for “continuity” in a market is a demand for delay in responding to the change in demand conditions, and, the *Special Study* to the contrary, there simply is no merit in such delay.

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inventories will not be held in quantities sufficient to cope with the longest runs.)

With perfect foresight, the analysis would be modified in only one respect in order to be applied to changing equilibrium prices: the equilibrium price of a security could never fluctuate by more than the cost of holding it.

The popular NYSE practice of suspending trading until buy and sell orders can be matched at a “reasonable” price is open to serious objection. To prevent a trade is no function of the exchange, and any defense must lie in a desire to avoid “unnecessary” price fluctuations. An unnecessary price fluctuation is surely one not called for by the conditions of supply and demand of the *week* even though the fluctuation may reflect supply and demand of the *hour*. This suspension of trading means that the exchange officials know the correct price change when there is a flood of buy or sell orders. We need not pause to inquire where they get this clairvoyance; it is enough to notice that the correct way to iron out the unnecessary wrinkles in the price chart is to speculate: to buy or sell against the unnecessary movement. The omniscient officials should be deprived of the power to suspend trading but given vast sums to speculate. Since omniscience can surely earn 20 or 50 per cent a year on the market, there should be no trouble in raising the capital. To disassociate random from persistent changes is sufficiently difficult, however, to make me very admiring of the courage of those who invest in Omniscience Unlimited.

The wholly unexpected shift in market conditions infrequently occurs—as the assassination of President Kennedy and the heart attack of President Eisenhower illustrate. But almost every event casts a shadow before it: the outbreak of war, the expropriation of foreign subsidiaries, the growth of imports of a product, the glowing income statement—all are more or less predictable as to date and import. The speculators then act within a system in which there is partial anticipation of most events that occur (and many that do not). They will attempt to guess the future course of events, and to the extent

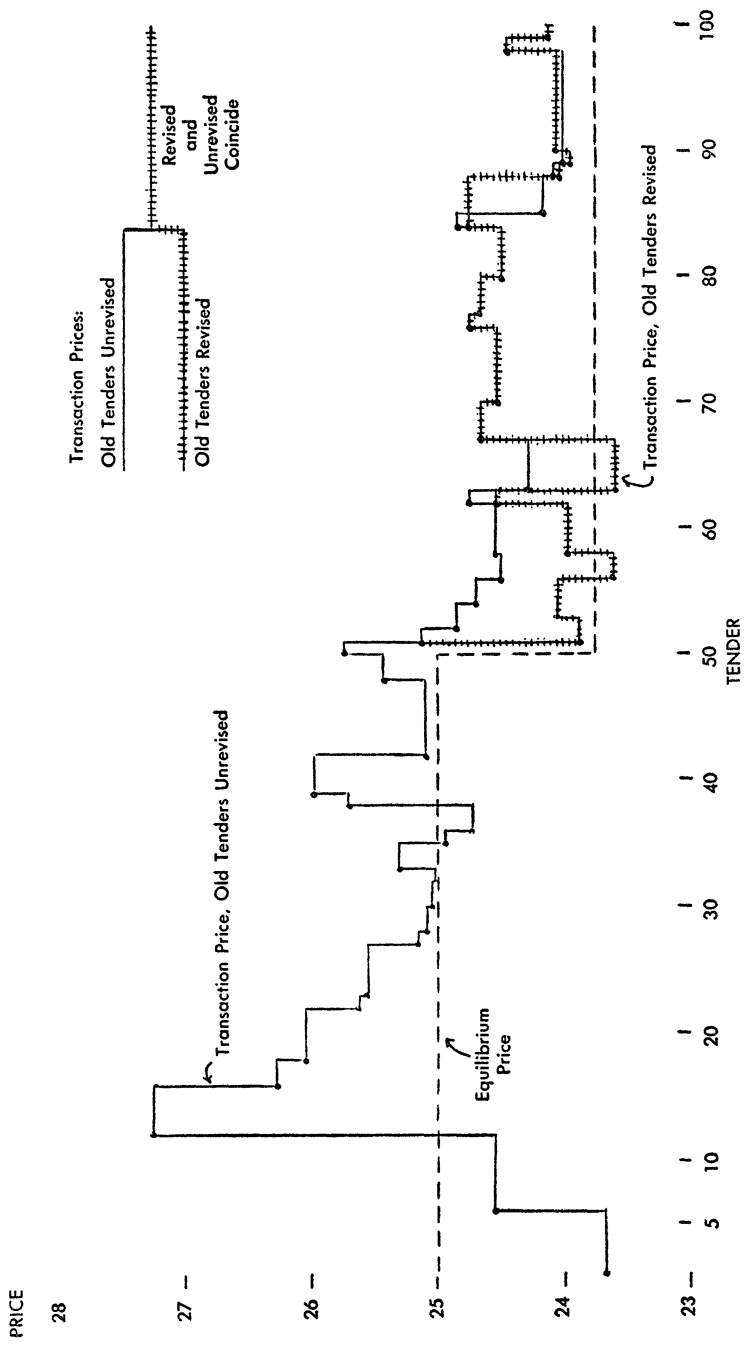


Fig. 2.—Sequence of transaction prices generated by random normal deviates: Equilibrium price of \$25.00 for first 50 tenders; equilibrium price of \$23.75 thereafter.

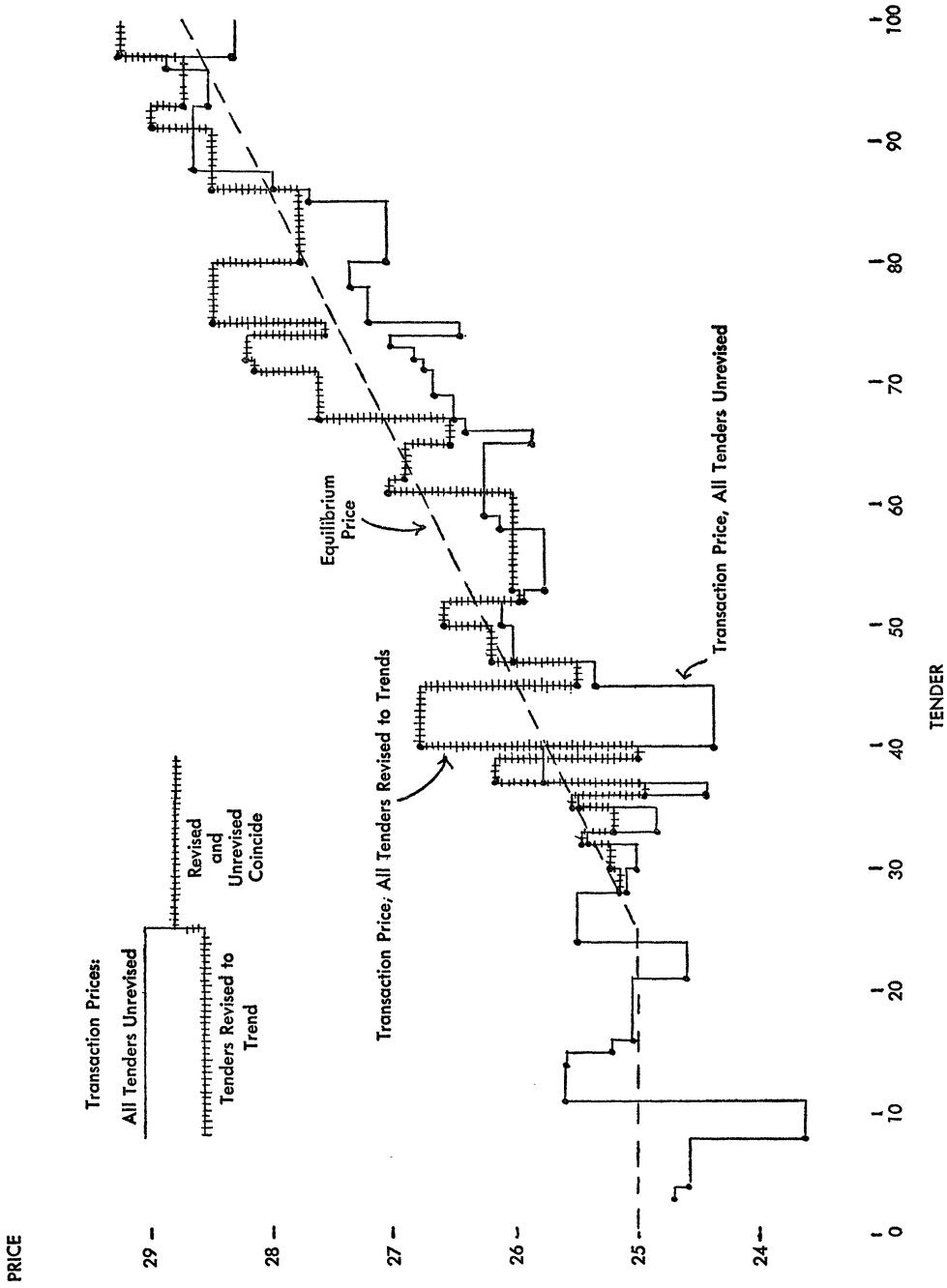


Fig. 3.—Sequence of transaction prices generated by random normal deviates: Equilibrium price of \$25.00 for first 25 tenders increasing by \$0.05 per tender thereafter.

that they succeed they will make profits and smooth the path of the price quotations.

In appraising the performance of the market under changing conditions we must abandon our criterion of efficiency in a stationary market that price should be constant over time (p. 129). We now must judge the performance of two functions by the speculator:

1. How efficiently does he perform his function of facilitating transactions by carrying inventories and making bid and ask prices?
2. How efficiently does he predict changes in equilibrium prices, or, in other words, how closely does he keep bid and ask prices to the levels which in retrospect were correct?

The first of these functions is analytically the same as that encountered in the stationary market, but it is now more difficult to discharge or appraise. It is much harder to judge the proper inventories and the proper amount of resources to devote to ascertaining the "true" market price than in the stationary market. The criterion of efficiency is still the cost of consummating a transaction. Much current work on inventory theory, queueing, and related subjects should contribute to the power of our tests of the efficiency of speculators.

The second function, the anticipation of price changes, has one measurable attribute: the trading profits of the speculators are a measure of their skill in anticipating price movements. What is more interesting is that the positive profits of the speculators also demon-

strate that their activity stabilizes prices in the sense of reducing the variance of prices over time.<sup>17</sup>

These profits as reported by the *Special Study* have been quite attractive: on liquid capital of \$76.3 million in 1960, specialists made a trading income of \$21.2 million (Part II, pp. 371, 373), as well as making \$19.6 million in commissions. No profitability data are given for floor traders.

#### 4. CONCLUSION

I have argued at suitable length that the Cohen Report makes poor use of either empirical evidence or economic theory, so its criticisms are founded upon prejudice and its reforms are directed by wishfulness. Full disclosure is the rule of the hour, so I must add that the academic scholars have not given the capital markets the attention they deserve because of their importance and analytical fascination. The area is replete with problems in the economics of information: What over-the-counter transactions should be required to be reported? Should floor traders' orders be delayed in execution to achieve parity with outsiders? and the like. It is an equally attractive area for the theory of decisions under uncertainty: what are the ex post criteria of efficient speculation? The prospectuses of research are glowing—should we start censoring this form of literature too?

<sup>17</sup> See Lester G. Telser, "A Theory of Speculation Relating Profitability and Stability," *Review of Economics and Statistics*, August, 1959.

#### APPENDIX

The lists of new flotations of common and preferred stocks are taken from the *Commercial and Financial Chronicle* for the earlier period, and *Investment Dealer's Digest* for the later period. Issues first offered only to stockholders

and privately placed issues are excluded, as are public utilities and railroads.

The price quotations are the initial asking price and, at subsequent twelve-month intervals, the averages of the weekly high and low

for the week nearest the middle of the month. Averages of monthly highs and lows are employed where weekly quotations are not available. Stock splits and dividends are eliminated, that is, the price of a share is multiplied by the number of shares the original share has become. If an issue of preferred stock is retired, its retirement value is used in the year of retirement, after which it is dropped from the sample.

The price relatives presented here are relative to issue price.

The market index is *Standard and Poor's Annual Industrial Index*. It is said to be biased upward in the early period but not in the later period; this bias would of course exaggerate the influence of the S.E.C. in our tests. *Standard and Poor's Index* covers only common stocks. Tables 1 and 3 of the text summarize information for these price relatives deflated by the relative value of the market index for the same period.

**TABLE A1**  
**PRICE RELATIVES OF COMMON STOCKS**  
 (Issue Price = 100)

MONTH OF ISSUE AND STOCK NAME	VALUE OF ISSUE (THOUSANDS)	YEAR AFTER ISSUE				
		1 Year	2 Years	3 Years	4 Years	5 Years
1923						
1—Cuy Amel Fruit Co.....	\$ 2,942	135.0	99.3	90.6	61.8	99.8
2—Household Products, Inc.....	9,350	97.1	105.7	132.4	142.1	195.8
4—Inland Steel.....	8,006	72.2	85.8	80.8	93.7	115.9
4—Eaton Axle & Spring Co.....	4,200	51.7	50.4	91.2	87.5	116.5
5—Munsing Wear, Inc.....	3,780	81.2	75.0	84.5	87.2	137.5
11—Wm. Wrigley Jr. & Co.....	12,000	111.2	140.5	132.5	165.0	190.0
12—National Dairy Corp.....	4,125	129.2	233.7	223.9	195.3	358.2
1924						
3—Transcontinental Oil Co.....	\$ 8,000	117.2	93.8	112.5	195.2	248.5
6—Game Well Co.....	3,000	n.a.	n.a.	112.5	140.1	156.0
11—Brunswick Balke-Callender.....	6,435	65.4	70.3	67.9	113.5	46.2
12—Long-Bell Lumber Co.....	7,912	93.7	80.4	53.1	55.9	24.6
12—(Frank G.) Shattuck Co.....	2,750	252.2	229.5	327.3	444.3	460.9
12—The Symington Co.....	996	95.0	87.1	87.9	30.1	20.9
1925						
1—Music Master Corp.....	\$ 3,000	15.6	0.0	0.0	0.0	0.0
2—The Gould Coupler Co.....	3,675	82.0	35.0	36.5	30.0	36.5
2—The Cudahay Packing Co.....	4,280	85.5	48.7	64.7	61.6	42.1
4—Dodge Bros. Inc.*.....	20,986	110.6	79.2	86.3	75.3	31.8
4—Gabriel Snubber Mfg. Co.....	4,950	132.5	138.7	77.5	92.0	34.0
5—Sun Oil Co.....	5,767	88.4	91.1	136.5	190.2	218.7
6—Hunt Bros. Packing Co.....	2,600	n.a.	89.6	91.4	90.4	81.7
7—Atlas Plywood Corp.....	2,500	120.0	104.8	169.5	109.1	37.5
7—Lehn & Fink Products.....	8,578	99.5	99.0	132.7	140.9	81.5
8—The Maytag Co.....	5,000	114.0	158.8	89.4	128.1	56.9
8—Vick Chemical Co.....	4,100	118.4	136.7	164.8	175.1	164.6
8—Industrial Rayon Corp.....	3,000	42.5	47.8	85.2	99.8	91.9
9—Safety Insulated Wire & Cable Co. <sup>b</sup>	6,250	104.6	133.2	145.0	219.0	72.4
10—Tung-Sol Lamp Works Inc.....	2,940	98.0	116.9	142.8	220.5	n.a.
10—American Brown Boveri Electric.....	13,000	76.5	19.6	28.6	35.2	26.5
10—Gotham Silk Hosiery Co.....	2,750	205.4	285.4	280.4	134.2	33.1
10—Western Dairy.....	3,600	100.0	115.8	129.9	116.9	51.1
11—Fox Theatre Corp.....	12,500	95.7	77.2	115.0	50.3	28.0
11—Rice-Stix Dry Goods Co.....	2,650	76.9	82.1	71.2	55.7	37.3
12—Consolidated Laundries Corp.....	2,750	98.9	71.0	86.1	48.0	59.4
1926						
1—North American Car Corp.....	\$ 2,588	94.4	106.6	210.7	128.2	95.2
1—Congress Cigar Co, Inc.....	2,800	135.0	200.8	204.2	113.1	56.2
1—Beacon Oil Co. <sup>c</sup> .....	5,700	105.3	84.2	122.0	78.3	52.0
2—American Home Products Corp.....	5,962	120.8	238.2	290.6	221.2	217.9
2—Grief Bros. Cooperage Co.....	2,560	105.6	106.9	100.6	56.2	50.8
2—Amerada Corp.....	3,250	141.6	112.5	123.6	74.5	74.5
3—Lambert Co.....	7,958	176.5	223.8	234.5	255.7	205.8
7—American Solvents & Chemicals.....	632	n.a.	158.7	270.5	61.3	9.9
8—Liquid Carbonic Corp.....	3,220	102.9	178.6	267.3	205.3	61.5

\* Acquired by Chrysler Motors on July 30, 1928.

<sup>b</sup> Name changed to Safety Cable Co., October 6, 1925, and changed to General Cable Co., November 14, 1927.

<sup>c</sup> Name changed to Colonial Beacon Oil, 1930.



TABLE A1—Continued

MONTH OF ISSUE AND STOCK NAME	VALUE OF ISSUE (THOU- SANDS)	YEAR AFTER ISSUE				
		1 Year	2 Years	3 Years	4 Years	5 Years
1926						
9—Penn-Dixie Cement Co.....	\$12,900	59.6	34.0	21.5	15.7	4.0
11—Pacific-Clay Products.....	2,800	100.9	98.7	105.4	54.9	33.9
12—Patino Mines Enterprises Consol....	5,000	89.8	132.7	117.2	34.0	26.0
12—Fulton Sylphon Co. <sup>d</sup> .....	3,900	118.4	115.4	64.1	32.2	22.4
1927						
1—National Tile Co.....	\$ 2,970	n.a.	105.3	82.2	21.2	8.3
3—W. T. Grant Co.....	2,688	250.0	267.6	71.3	72.6	60.6
3—Mandel Bros. Inc.....	3,638	78.4	71.1	29.8	10.4	5.2
6—Pillsbury Flour Mills, Inc.....	3,500	37.2	43.8	30.0	27.5	13.2
8—(John W.) Watson Co.....	4,900	27.6	13.5	8.6	1.6	1.3
10—Hershey Chocolate Corp.....	3,468	174.3	311.8	243.0	238.4	169.4
11—National Radiator Corp.....	2,535	45.2	9.8	3.2	0.3	0.0
11—United Biscuit Co. of America.....	2,800	181.9	130.8	126.8	95.8	66.5
12—McKeesport Tin Plate Co.....	6,000	120.0	106.2	114.4	80.2	74.8
1928						
1—Consolidated Film Industries.....	\$ 1,575	83.1	63.5	46.2	19.0	13.8
2—National Trade Journal Inc.....	2,529	29.8	12.3	3.0	0.0	0.0
3—Cutler-Hammer Mfg. Co.....	3,088	129.7	219.5	84.6	21.2	13.9
4—Neve Drug Stores, Inc. <sup>e</sup> .....	4,000	56.2	23.3	14.8	n.a.	n.a.
5—H. W. Gossard Co.....	2,588	90.0	64.8	12.8	2.0	4.6
5—Spiegel, May, Stern & Co.....	4,060	178.6	57.3	13.4	2.8	10.3
6—Grasselli Chemical Co. <sup>f</sup> .....	4,700	274.0	155.3	129.2	33.7	112.8
6—International Printing Ink Corp.....	4,945	119.8	83.7	18.3	9.3	27.0
6—National Aviation Corp.....	3,525	281.7	52.7	27.5	14.6	45.0
6—The Wayne Pump Co.....	820	52.1	35.7	8.2	1.2	2.2
6—Consolidated Automatic Merchandising.....	824	55.9	6.8	2.3	0.7	3.4
7—Kimberly-Clark Corp.....	7,280	99.5	102.9	60.9	19.2	41.9
9—Anchor Cap Corp.....	4,239	166.5	96.5	46.2	25.3	62.9
9—Curtis Flying Service <sup>g</sup> .....	9,450	146.4	35.7	16.1	11.9	17.9
10—Hershey Corp. <sup>h</sup> .....	1,338	94.2	18.5	11.4	8.0	9.8
10—Sonora Products.....	3,000	15.0	0.0	0.0	0.0	0.0
10—Allied Products Corp.....	2,500	120.1	33.8	20.0	11.5	12.8
10—Lane Drug Stores Inc.....	785	60.5	4.1	1.3	n.a.	n.a.
11—Joseph T. Ryerson & Son.....	3,900	84.6	66.0	37.7	19.2	31.4
11—Associated Rayon Corp.....	3,352	12.7	3.7	6.2	n.a.	n.a.
11—Bellanca Aircraft Corp.....	2,972	31.9	16.8	6.4	2.6	17.0
11—United Aircraft & Transport.....	1,116	112.5	69.0	38.6	59.9	74.1
11—Great Lakes Aircraft Corp.....	4,900	32.4	9.2	10.2	2.5	2.8
11—Ranier Pulp & Paper Co.....	3,325	81.2	36.1	30.1	19.6	58.6
11—Ritter Dental Mfg. Co.....	2,580	102.3	70.4	29.2	20.9	23.3
11—Universal Aviation.....	4,300	40.7	23.5	16.1	35.3	44.3
11—Pacific Western Oil Corp.....	16,080	58.3	38.5	20.8	17.7	32.3
11—Merritt-Chapman & Scott.....	2,500	84.5	72.0	40.0	1.1	19.2
11—Strauss (Nathan) Inc.....	2,695	54.9	20.4	0.2	0.0	0.0
12—Aluminum Goods Mfg. Corp.....	4,000	113.1	71.6	49.7	42.2	46.2
12—Helena Rubinstein.....	3,147	28.4	8.3	3.8	3.2	1.9
12—Hahn Dept. Stores.....	17,252	39.0	20.7	8.6	4.0	14.1
12—Kroger Grocery & Baking.....	9,194	51.5	21.8	21.4	18.9	26.4

<sup>d</sup> Acquired by Reynolds Metal Co., January, 1929.

<sup>e</sup> Acquired by United Retail Chemists in December, 1928.

<sup>f</sup> Acquired by DuPont Chemical Co., November 1928.

<sup>g</sup> Acquired by Curtiss Wright in August, 1929.

<sup>h</sup> Name changed to Houdaille-Hershey Corp. on January 30, 1929.

TABLE A1—Continued

MONTH OF ISSUE AND STOCK NAME	VALUE OF ISSUE (THOU- SANDS)	YEAR AFTER ISSUE				
		1 Year	2 Years	3 Years	4 Years	5 Years
1949						
1—Bethlehem Steel Corp.....	\$20,409	99.0	171.0	161.4	172.1	165.8
1—Affiliated Gas Equip., Inc.....	9,250	113.5	106.2	97.3	104.8	86.5
1—Koppers Co., Inc.....	12,400	94.0	122.8	152.6	128.6	102.6
3—Sylvania Electric Products, Inc....	5,469	99.8	130.6	176.8	162.3	178.2
4—Liggett & Myers Tobacco Co.....	38,729	163.9	135.5	128.2	151.8	121.4
1950						
4—Dumont (A.B.) Labs, Inc.....	\$ 6,250	43.9	46.4	38.8	26.6	40.2
6—Sunray Oil Corp. <sup>1</sup> .....	9,469	152.5	166.4	139.1	151.5	201.1
9—Canadian Superior Oil of California, (Ltd.).....	19,350	145.6	121.2	72.5	108.8	120.0
10—Kaiser Steel Corp.....	31,616	104.0	102.5	102.5	112.6	120.2
12—International Min. & Chem.....	10,224	75.4	77.6	58.7	77.1	60.4
1951						
3—Jones & Laughlin Steel Corp.....	\$25,250	92.6	90.4	84.9	139.8	197.0
3—Kimberly Clark Corp.....	9,000	102.1	96.1	119.4	202.8	235.6
5—Sylvania Electric Products Inc....	11,650	114.8	121.3	121.9	158.0	177.9
6—Squibb (E. R.) & Sons <sup>1</sup> .....	15,375	49.5	41.6	53.0	68.3	62.8
10—Aluminium Ltd.....	7,095	94.9	87.5	125.8	197.4	237.8
10—Sharon Steel Corp.....	7,314	81.9	80.7	69.0	106.9	110.0
10—Lion Oil <sup>k</sup> .....	14,788	82.7	71.9	98.2	155.8	131.1
12—Federated Dept. Stores.....	10,030	112.8	99.6	141.9	173.9	157.3
1952						
2—Koppers Co.....	\$11,250	85.3	76.4	103.9	119.4	120.6
2—Owens-Corning Fiberglass.....	16,088	125.2	156.6	196.1	281.4	312.6
2—Rheem Mfg. Co.....	6,200	89.1	88.3	141.7	110.5	60.1
2—Marathon Corp.....	10,900	86.7	80.3	108.9	137.8	107.8
2—Monsanto Chemical Co.....	39,200	94.0	86.2	108.2	135.6	96.6
3—Ga.-Pacific Plywood & Lumber Co. <sup>1</sup>	5,250	81.2	53.9	127.4	217.7	292.7
3—Can. Chem. & Cellulose Co.....	7,750	81.0	53.6	67.0	64.9	48.0
5—Lion Oil Co. <sup>k</sup> .....	16,048	86.9	100.3	122.4	156.6	133.9
5—Food Mach. & Chemical.....	13,425	82.7	95.4	112.0	147.5	139.1
5—Federated Petrol. Ltd <sup>m</sup> .....	5,175	52.9	38.6	49.6	59.5	100.1
7—Deere & Co.....	22,121	81.4	90.1	113.7	86.1	91.2
8—Pillsbury Mills.....	5,640	107.0	139.7	155.1	143.2	131.8
12—Colorado Fuel & Iron.....	6,000	89.6	120.6	167.0	180.4	109.0

<sup>1</sup> Name changed to Sunray Mid-Continent Oil Company, 1955.

<sup>j</sup> Merged with (Olin) Mathieson (Chemical) Corp., 1952.

<sup>k</sup> Acquired by Monsanto Chemical, September 30, 1955.

<sup>l</sup> Name changed to Ga-Pacific Corp., April 1956.

<sup>m</sup> Merged with Home Oil, December 1955.

TABLE A1—Continued

MONTH OF ISSUE AND STOCK NAME	VALUE OF ISSUE (THOU- SANDS)	YEAR AFTER ISSUE				
		1 Year	2 Years	3 Years	4 Years	5 Years
1953						
2—Sylvania Electric Prods.....	\$20,141	92.7	135.4	135.9	122.4	108.5
4—Clevite Corp.....	5,076	82.7	86.7	84.7	81.8	65.0
4—P. Lorillard.....	8,290	105.9	96.8	85.0	72.9	226.9
9—Stauffer Chemical.....	7,750	148.0	221.5	299.4	262.6	343.4
1954						
1—Colorado Oil & Gas.....	\$12,500	108.0	128.0	154.0	108.5	132.5
2—Wagner Electric Corp.....	5,400	87.8	95.5	136.1	107.6	143.8
4—American Tide Lands <sup>a</sup> .....	20,000	11.8	8.8	6.5	1.7	4.2
12—Monterey Oil Co.....	10,950	91.1	88.5	58.2	96.1	64.0
1955						
1—United Artists Theatre Circuit....	\$ 6,802	50.0	34.9	25.7	56.2	50.7
2—Allied Stores Corp.....	16,425	96.7	76.6	77.3	102.6	98.1
4—Storer Broadcasting Co.....	6,469	99.2	113.7	93.2	130.0	116.3
10—Copperweld Steel Co.....	6,000	115.5	109.5	132.5	196.3	135.0
11—Marquette Cement Mfg.....	8,688	98.0	84.2	152.9	136.7	139.6
11—Kimberly-Clark Corp.....	18,552	93.4	94.1	148.2	144.2	177.2
12—LeCuno Oil Corp.....	4,060	61.6	41.0	35.7	17.9	10.7
12—Minute Maid Corp.....	6,900	59.8	29.0	100.4	118.0	207.2

<sup>a</sup> Name changed to Marine Drilling Inc., September 1, 1957.

TABLE A2  
PRICE RELATIVES OF PREFERRED STOCKS  
(Issue Price = 100)

MONTH OF ISSUE AND STOCK NAME	VALUE OF ISSUE (THOU- SANDS)	YEAR AFTER ISSUE				
		1 Year	2 Years	3 Years	4 Years	5 Years
1923						
1—(Edward G.) Budd Mfg.....	\$ 3,000	n.a.	n.a.	n.a.	n.a.	73.7
1—Hammerhill Paper Co.....	3,000	101.0	105.0	108.8	108.8	109.0
1—Reliance Mfg. Co.....	2,500	96.2	87.1	88.4	99.0	99.2
1—Armour & Co.....	60,000	93.6	93.2	98.4	95.2	90.0
1—Lyon & Healy, Inc.....	2,500	98.2	103.5	110.0	*	*
1—American Rolling Mill.....	7,000	100.5	107.2	110.2	112.8	110.0
2—Onyx Hosiery, Inc. <sup>a</sup> .....	3,500	89.5	80.5	97.5	114.3	122.2
2—National Dept. Stores.....	5,000	95.5	99.5	95.8	91.5	91.2
2—Rosenbaum Grain Corp.....	3,625	95.1	94.1	7.8	29.4	33.3
3—American Chain Co.....	8,750	87.0	93.9	94.6	118.6	*
3—National Cloak & Suit Co. <sup>b</sup> .....	4,000	93.5	101.0	84.5	90.8	99.9
4—Inland Steel.....	10,000	98.0	100.6	105.3	108.4	111.4
5—Sherman Clay & Co.....	3,000	n.a.	n.a.	94.8	97.7	98.6
9—Remington Arms Co. Inc.....	4,000	n.a.	n.a.	100.3	94.1	101.6
11—Palmolive Co. <sup>c</sup> .....	4,000	n.a.	n.a.	n.a.	107.9	110.0
1924						
9—Franklin Simon & Co.....	\$ 4,000	101.7	103.9	107.1	104.6	96.4
10—R. Hoe & Co. Inc.....	4,000	90.0	59.0	66.0	38.0	52.0
12—Universal Pictures Corp.....	3,000	94.9	97.8	99.1	93.5	39.5
12—The Symington Co.....	4,504	51.8	24.2	19.4	51.6	37.2
1925						
2—Artloom Corp.....	\$ 3,000	111.0	113.6	113.0	99.0	60.9
2—First National Pictures, Inc.....	2,500	103.7	97.6	107.5	106.0	115.0
2—Spear & Co.....	4,500	81.9	78.6	80.4	80.2	79.1
2—General Outdoor Advertising.....	5,812	118.7	124.2	123.7	109.1	92.3
4—Dodge Bros. Inc. <sup>d</sup> .....	64,014	108.2	99.2	96.3	152.7	*
7—International Cement Corp.....	6,750	101.8	106.8	107.3	*	*
7—International Match Corp.....	20,250	144.9	157.9	229.4	203.6	173.2
7—The Outlet Co.....	3,500	101.1	110.5	114.5	82.0	105.0
9—(Edward G.) Budd Mfg. Co.....	2,500	n.a.	n.a.	n.a.	75.6	61.9
9—Real Silk Hosiery Co.....	2,500	n.a.	88.8	93.0	97.1	89.5
10—The Miller Rubber Co. <sup>e</sup> .....	4,000	96.6	96.6	77.8	42.5	13.1
10—National Tea Co.....	3,250	124.8	164.4	287.2	250.0	71.0
10—Gotham Silk Hosiery Co.....	4,500	114.9	121.0	111.0	82.9	68.6
11—Firestone Tire & Rubber Co.....	10,000	98.8	107.9	108.0	111.1	*
12—St. Maurice Valley Corp.....	3,806	n.a.	100.4	96.6	91.0	50.0
12—Abraham & Strauss, Inc.....	4,250	110.1	110.8	109.6	104.4	106.4
12—New York Cannery Inc.....	5,100	89.4	55.0	38.9	27.9	14.5

\* Issue retired.

<sup>a</sup> Acquired by Gotham Silk, December, 1926.

<sup>b</sup> Name changed to Bellas Hess Co., March, 1927.

<sup>c</sup> Name changed to Palmolive-Peet Company, February, 1927, and to Colgate-Palmolive-Peet Company, June, 1928.

<sup>d</sup> Acquired by Chrysler Corp., July 30, 1928.

<sup>e</sup> Acquired by B. F. Goodrich, March, 1930.

TABLE A2—Continued

MONTH OF ISSUE AND STOCK NAME	VALUE OF ISSUE (THOU- SANDS)	YEAR AFTER ISSUE				
		1 Year	2 Years	3 Years	4 Years	5 Years
1926						
1—Chandler Cleveland Motors <sup>f</sup> .....	\$ 3,360	48.0	35.3	40.8	11.2	4.4
1—Crown-Williamette Paper Co.....	20,000	99.9	97.8	96.5	100.6	68.0
1—White Sewing Machine Co.....	5,000	113.5	109.1	112.8	58.5	13.8
1—Louisiana Oil Refining Corp.....	4,000	96.6	90.0	92.2	86.0	55.0
2—Bethlehem Steel Corp.....	35,000	107.7	120.6	121.8	126.4	121.4
2—Zellerbach Corp.....	5,850	99.0	141.9	98.0	82.3	41.3
3—Collins & Aikman Co.....	5,000	152.7	99.9	94.1	83.2	73.9
6—American Seating Corp.....	3,000	123.3	99.3	92.7	28.0	12.7
7—American Solvents & Chem.....	2,868	69.7	110.5	174.3	69.7	10.9
8—The Halle Bros. Co.....	2,500	102.5	102.5	102.0	97.5	90.0
9—Sculling Steel Co.....	3,850	85.7	93.8	76.0	45.4	13.0
9—Pacific Coast Biscuit Co. <sup>g</sup> .....	2,910	99.5	88.7	101.6	359.9	352.5
9—Penn-Dixie Cement Corp.....	7,215	94.1	75.8	44.7	40.4	10.1
10—Central Alloy Steel Corp. <sup>h</sup> .....	6,189	100.5	103.5	104.2	69.5	17.8
10—(Edward G.) Budd Mfg. Co.....	3,000	n.a.	32.8	81.1	63.9	23.7
10—Broadway Dept. Stores.....	3,000	108.4	102.3	93.4	71.7	n.a.
11—Gotham Silk Hosiery Co.....	5,000	117.2	117.0	83.1	62.3	58.8
12—Flintkote Co.....	2,500	n.a.	110.0	*	*	*
1927						
2—General Motors Corp.....	\$25,000	104.2	104.6	101.6	83.1	70.2
2—L. Bamberger & Co.....	10,000	106.7	105.3	104.1	101.6	91.4
3—American Chain Co.....	11,000	100.3	82.0	94.0	35.6	17.5
3—Richfield Oil Co. of Cal.....	5,000	111.2	180.5	107.0	24.7	2.5
4—United Cigar Stores of America...	20,000	104.7	92.2	40.8	70.0	8.3
5—Crown-Zellerbach Corp.....	2,992	127.3	92.0	81.2	21.6	13.8
5—Sun Oil Co.....	4,500	109.8	102.9	104.1	95.0	73.4
6—International Paper Co.....	15,000	105.2	87.9	78.2	25.0	4.8
6—Pillsbury Flour Mills Inc.....	3,000	111.4	109.4	75.0	68.8	33.1
7—Auto Strap Safety Razor Co. <sup>i</sup> .....	3,762	104.9	99.7	145.4	163.1	157.6
7—Collins & Aikman Corp.....	5,500	89.6	90.3	80.3	77.9	55.3
7—Pennsylvania Glass Sand Corp....	3,000	n.a.	115.0	105.0	90.0	n.a.
7—Foster Wheeler Corp.....	3,500	n.a.	n.a.	205.0	100.0	75.0
8—National Radiator Corp.....	5,850	66.7	15.9	4.0	0.9	0.0
8—Weber & Heilbronner, Inc. <sup>j</sup> .....	2,500	98.5	90.6	49.0	13.7	4.9
10—Hershey Chocolate Corp. (6 per cent cum. prior pref.).....	15,000	104.6	107.6	108.6	*	*
10—Hershey Chocolate Corp (conv. pref. cum \$4/sh.).....	22,432	124.4	221.3	143.5	132.6	122.3
10—St. Regis Paper Co.....	2,740	86.3	99.0	106.4	n.a.	30.9
12—The Cuneo Press Inc.....	2,500	92.4	78.7	89.0	65.4	61.7
12—George A. Fuller Co.....	4,478	104.9	96.5	82.9	30.2	9.2
12—F. & W. Grand 5-10-25¢ Stores...	2,500	72.8	38.6	21.4	2.4	0.9
12—Loews Inc.....	15,000	101.4	44.3	90.5	59.2	59.6

<sup>f</sup> Merged with Hupp Motor Car, 1930.

<sup>g</sup> Acquired by National Biscuits, June, 1930.

<sup>h</sup> Merged with Republic Steel, April, 1930.

<sup>i</sup> Acquired by Gillette Safety Razor, November, 1930.

<sup>j</sup> Name changed to Fashion Park, 1929.

TABLE A2—Continued

MONTH OF ISSUE AND STOCK NAME	VALUE OF ISSUE (THOU- SANDS)	YEAR AFTER ISSUE				
		1 Year	2 Years	3 Years	4 Years	5 Years
1928						
1—General Tire & Rubber Co.....	\$ 3,500	99.5	88.7	82.4	58.3	35.3
1—Consolidated Film Industries.....	6,375	126.2	92.3	82.1	50.6	43.2
1—Walgreen Co.....	4,500	95.5	91.0	85.0	64.7	92.4
2—Hamilton Watch Co.....	4,800	100.2	103.5	102.0	64.7	19.9
2—United Piece Dye Works.....	3,750	103.4	93.7	102.2	88.4	68.0
2—Interstate Dept. Stores Inc.....	3,250	128.3	70.8	58.0	46.0	17.4
2—Keith-Albee Orpheum Co.....	10,000	112.4	99.5	94.3	24.8	10.9
2—Neisner Bros. Inc.....	2,500	178.3	106.5	68.9	2.8	12.8
2—Schulte-United 5¢-\$1 Store.....	10,000	76.0	18.0	1.1	0.0	0.0
3—Spang Chalfant & Co. Inc.....	2,500	94.9	96.9	93.4	43.4	20.7
3—Barker Bros. Corp.....	3,000	96.0	78.5	55.0	25.0	1.1
3—Standard Dredging Company.....	4,350	123.3	103.4	33.2	7.8	2.1
4—Brown Co.....	10,000	97.4	28.3	34.0	4.7	2.8
4—Cavanagh-Dobbs, Inc. <sup>k</sup> .....	3,500	96.4	70.2	22.0	7.6	6.0
4—Unit Corp. of America.....	3,135	98.2	79.0	16.7	0.9	0.0
4—Metropolitan Chain Stores.....	3,500	99.1	72.6	8.7	0.0	0.0
4—Peoples Drug Store, Inc.....	2,500	107.9	100.5	95.6	81.9	60.5
4—Consumers Co.....	5,000	79.0	67.4	41.6	4.2	1.6
5—I. Miller & Sons, Inc.....	2,500	90.5	77.1	39.3	13.9	5.8
5—Speigel, May, Stern & Co.....	7,000	89.2	69.4	17.6	19.8	35.1
5—Borg Warner.....	3,500	109.8	95.0	95.6	51.7	85.7
6—Hart-Carter Co.....	4,480	78.9	56.6	20.3	7.8	25.2
6—International Printing Ink Corp.....	7,000	95.7	94.0	59.1	31.7	68.1
6—The Wayne Pump Co.....	2,218	78.1	65.9	30.4	5.2	4.7
6—California Dairies Inc.....	4,312	50.4	44.9	21.4	4.1	9.8
6—Consolidated Automatic Merchandising.....	10,176	38.8	6.9	1.0	0.3	1.5
6—Crosse & Blackwell, Inc.....	2,704	94.7	71.2	46.8	n.a.	n.a.
6—Leath & Co.....	2,642	78.8	65.4	17.3	13.5	8.2
7—Miller & Hart Inc.....	2,860	82.0	60.6	33.6	15.4	22.1
9—Anchor Cap Corp.....	3,060	139.3	104.9	85.3	69.2	88.0
9—Kendall Co.....	3,888	88.7	68.0	40.5	26.2	67.0
9—McKesson & Robbins.....	9,889	107.4	77.4	57.4	18.1	40.0
10—Houdaille-Hershey Corp.....	1,329	97.2	44.2	40.3	19.8	26.9
10—Mullins Mfg. Co.....	3,060	83.3	40.3	22.7	15.4	10.4
10—Chase Brass & Copper Co.....	2,500	99.4	100.1	87.8	72.2	84.4
10—Mid-Continent Laundries.....	3,400	65.4	6.6	3.7	n.a.	n.a.
10—Lane Drug Stores, Inc.....	1,717	79.5	3.8	2.4	n.a.	n.a.
11—Associated Rayon Corp.....	17,648	39.8	48.2	33.1	*	*
11—United Aircraft & Trans. Corp.....	4,194	112.5	116.3	103.0	118.8	131.6
11—Kraft Phenix Cheese <sup>l</sup> .....	6,000	96.0	45.5	37.7	30.0	28.6
12—Thompson & Stanet Co.....	8,800	67.7	50.6	34.3	30.1	39.7
12—Hahn Dept. Stores.....	22,700	76.6	54.8	30.3	12.9	24.9
12—Koppers Gas & Coke.....	20,000	98.5	97.0	63.6	49.5	59.4
12—The Newport Co. <sup>m</sup> .....	6,500	104.0	70.5	110.2	4.4	14.5
1949						
4—Merck & Co. Inc.....	\$ 7,192	130.4	n.a.	110.2	98.0	101.7
5—United Biscuit Co. of America.....	8,280	104.1	103.6	101.4	98.8	102.9
6—Caterpillar Tractor Co.....	25,000	105.1	102.9	103.8	98.5	102.5
11—Clinton Industries Inc.....	5,025	109.6	98.5	89.1	95.4	113.8

<sup>k</sup> Merged with Hat Corp., May, 1932.

<sup>l</sup> Acquired by National Dairy, June 4, 1930.

<sup>m</sup> Name changed to Newport Industries, 1931.



TABLE A2—Continued

MONTH OF ISSUE AND STOCK NAME	VALUE OF ISSUE (THOU- SANDS)	YEAR AFTER ISSUE				
		1 Year	2 Years	3 Years	4 Years	5 Years
1950						
7—Spencer Chemicals.....	\$ 6,821	100.9	101.2	99.2	102.0	102.5
10—Kaiser Steel Corp.....	31,616	104.0	102.5	102.5	112.6	120.2
11—Safeway Stores.....	6,400	94.0	85.8	90.9	97.2	94.5
1951						
1—City Stores Co.....	\$ 6,000	86.1	82.1	75.8	96.0	105.8
1—Food Fair Stores, Inc.....	8,000	94.2	97.2	93.5	100.0	101.2
6—Minn.-Honeywell Regulator Co....	16,000	108.8	105.4	103.4	*	*
6—Pfizer (Chas.) & Co. Inc.....	15,000	110.7	93.8	103.3	113.8	98.7
6—Rheem Mfg. Co.....	7,000	92.1	89.7	100.5	118.4	90.2
6—National Tea Co.....	12,000	105.0	107.9	125.9	104.0	*
8—U.S. Plywood Corp.....	6,150	94.1	82.6	88.8	99.8	116.8
8—National Distillers Prods.....	50,000	101.5	88.8	93.8	99.8	100.6
9—National Container.....	12,600	87.1	74.3	92.6	141.7	231.4
10—Ashland Oil & Refining.....	5,045	100.5	97.7	99.5	101.8	97.9
10—Shell Mar Products <sup>a</sup> .....	5,200	123.2	118.5	127.4	*	*
12—(Olin) Mathieson Chem. Corp.....	18,000	109.8	103.9	122.5	120.9	108.1
12—Diamond Alkali Co.....	12,000	108.2	100.1	114.1	116.8	103.0*
12—Pittsburgh Coke & Chem.....	6,000	94.2	78.4	84.0	92.2	90.5
1952						
1—Kaiser Aluminum & Chem.....	\$18,750	92.5	95.2	169.4	104.0	*
1—Consolidated Grocers <sup>o</sup> .....	9,800	86.2	92.9	99.0	103.6	98.8
1—Atlas Plywood Corp.....	5,700	86.3	75.0	82.7	77.9	70.5
5—Elliott Co.....	6,000	107.5	102.1	101.8	94.5	104.2
6—Safeway Stores.....	20,000	106.0	103.0	*	*	*
1953						
3—P.R. Mallory.....	\$ 7,500	109.5	109.5	105.5	105.0	*
11—General Precision Equip.....	5,408	192.5	106.0	*	*	*
11—Dixie Cup <sup>p</sup> .....	7,623	142.2	137.2	133.5	104.0	*
1954						
2—Gulf Sulphur Corp.....	\$ 7,000	111.2	125.0	70.0	31.9	55.0
4—I.T.E. Circuit Breaker.....	5,000	101.8	97.0	93.0	74.4	92.1
5—Allis-Chalmers Mfg.....	35,700	121.6	110.3	113.0	93.6	108.8
9—Spencer Chemical Co.....	15,000	99.2	97.0	81.2	91.0	87.2
10—Mead Corp.....	7,800	132.9	103.8	*	*	*
11—Tung-Sol Electric.....	5,000	111.5	103.5	103.6	*	*
11—Penn. Fruit Co.....	5,225	106.2	82.3	70.3	95.7	98.6
1955						
3—General Tire & Rubber.....	\$10,225	108.6	126.0	143.8	380.4	428.7
3—Western Auto Supply.....	5,000	105.0	96.0	99.8	99.1	96.4
5—Minn.-Honeywell Regulator.....	16,320	102.9	*	*	*	*
9—Kaiser Aluminum & Chem.....	35,000	97.8	84.0	84.0	92.0	92.0

<sup>a</sup> Name changed to General Package Corp., July 1953.

<sup>o</sup> Name changed to Consolidated Foods Corp., February, 1954.

<sup>p</sup> Acquired by American Can, June, 1957.