A SHORT-RUN ANALYSIS OF NEW

ISSUE PRICE PERFORMANCE

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1963

Submitted to the Faculty of the
College of Business Administration of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
MASTER OF BUSINESS ADMINISTRATION
May, 1970

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PREFACE

The object of this report is to examine the short-run capital appreciation performance of newly issued common stock. Price performance is measured in terms of the magnitude and volitility of weekly percentage price changes. The analysis is accomplished for a 100 member sample and two component 50 member samples, the latter of which are homogeneous with regard to their origin in rising or falling markets.

An analysis of the results obtained from testing seven formal hypotheses reveals much about the distribution, direction, magnitude and volitility of the observed new issue weekly price changes. The theory underlying the probable causes of the results obtained is well elaborated. The contribution of this study is reviewed in perspective to the state of knowledge on the subject of new issue price performance and common stock investment in general.

Acknowledgement must first be made to the faculty of the College of Business Administration at the Oklahoma State University for the considerable contribution to the development of abilities that made this writing possible and further for the maintenance of an environment conducive to academic activity. Specifically, Dr. George Pinches deserves my sincere appreciation for his continuing interest and ever-ready guidance throughout all stages of the development of this report. Thanks is also in order to Dr. Winfield Betty as well as Dr. Pinches for expert review of the final draft and recommendations.

The fine library and research facilities of the Oklahoma State University and of the University of Colorado at Boulder deserve special mention for providing extensive source materials and for their cooperative and congenial staff assistance. Accolades of a similar nature are due the Oklahoma State University Computer Science Center. Gary Simon and Joe Potts provided indispensible programming assistance.

For devotion as well as for service, my appreciation extends to my wife, Ruth, who has made real contributions from data collection assistance to the expert typing of the final report. Finally, my mother must not be forgotten for limitless sacrifice and patience throughout all periods of my formal education.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION TO AND DESCRIPTION OF THE STUDY

Introduction

The past decade has witnessed a phenomenal increase in investment

interest in corporate common stock issues as measured by volume increases

on the major exchanges and over-the-counter markets. While the total

volume increases are of great significance, particular segments of the

total common stock population have received more investor enthusiasm

than others. One of these groups is the newly issued common stock of

seasoned and unseasoned corporations "going public" for the first time.

Because of the rapidly growing importance of the new issue market,[1]

the Securities and Exchange Commission has undertaken several studies to

analyze the effects of this phenomenon upon the general stability of the

stock market. Price performance[2] studies have also been accomplished by

the S.E.C. and others, but many deficiencies in our knowledge persist.

This is particularly true with regard to new issue price performance

during different market conditions.

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[1]Although no precise figures are available on the volume of new
issues coming to market, the Investment Dealers Digest has begun to keep
records in the past two years. The magazine reports that total common-
stock offerings in the first half of 1968 rose sharply to 422 while 174
issues were brought to market in the same period of 1967. Of the 422 1968
January through June offerings, 230 were initial public stock offerings.

[2]Price performance is construed to mean gross capital appreciation
without regard to dividends, taxes or purchase and selling transfer costs.

Statement of Purpose:

The purpose of the study is two-fold: first, to analyze and compare
relative short-run price performance of two samples of newly issued com-
mon stock (one from a rising and one from a falling market); and second,
to consolidate the two samples to determine if significant patterns exist
in terms of new issue price movements (extent and volitility) regardless
of the general market situation.

Scope:

This study utilizes weekly price data of newly issued common stock
of firms "going public," both seasoned and unseasoned. Seasoned issues
are those of firms with an operating record as a proprietorship, partner-
ship or privately held corporation. Unseasoned issues are those of a
new corporation entering into business for the first time. Further, only
industrials are considered except in so far as utilities and rails in-
fluence the index statistics (e.g., the NYSE Composite) which are used
only for sample selection. Risk factors are not considered per se--this
is a study of price data alone.

One hundred new issues comprise the total sample. They represent
samples of twenty-five each from four selected recent periods: two per-
iods of rising market prices and two periods of falling market prices.
These bull and bear market periods are selected by considering three mar-
ket indexes. Two samples each from bull and bear market periods were used
to make the sample period more inclusive and to increase "market type"
sample membership eligibles. Twelve weekly Wednesday closing bid prices
for each of the one hundred new issues comprise the raw data input for
the study.

Plan of Study

The paper is divided into six chapters. This, the first chapter, is designed to provide the reader with a general description of the study, questions the study is intended to answer, expectations regarding results, and underlying theory. Chapter II is a review of literature and a summary of results of new issue price studies accomplished in the past decade. Chapter III contains general methodology applicable to both parts of the study. Chapter IV is Part I of the main study which compares the bull market sample with the bear market sample in terms of weekly price changes (magnitude and volitility). Chapter V is Part II of the study which analyzes the total one hundred member sample price movements (magnitude and volitility), and is similar in design to Part I. Chapter VI contains a summary of the results of the two parts of the study with conclusions and implications for further study and practical use.

The statement of formal hypotheses, the testing of these hypotheses, and the results obtained are left to Chapters IV and V. Since several different statistical measurement techniques are used, and the various corresponding information sought is not necessarily directly related, each test of a hypothesis is self-contained. Nevertheless, the general aim of the study in terms of what is sought can be briefed here, together with some expectations as to the results and general theory or reasoning underlying these expectations.

Part I:

The purpose of Part I, Chapter IV, is to determine the effect of different general market conditions upon new issue prices. Since this

is a short-run analysis, the data collected includes the offer price and twelve subsequent weekly prices for each sample.

The comparison of bull and bear market samples is in terms of both the fifty member means and the twelve weekly means. The former will indicate the magnitude of mean gains or losses, and the latter will indicate specifically <u>when</u> (in which weeks) the changes occurred plus the relative dispersion in the weekly means. Some of the specific bull and bear market sample comparisons will be: (1) Does the distribution of the fifty mean price changes approximate a normal distribution as might be expected? (2) How do the two sample means compare--are they significantly different as might be expected? (3) Is the mean weekly price change negative for the bear market sample and positive for the bull market sample as might be expected? (4) When does the greatest price change occur--is it in the initial week as expected, and how do the weekly price changes compare between the bull and bear market samples? (5) In what weeks does the greatest dispersion about the mean price changes occur for the bull market and for the bear market? Again, greater dispersion (as a component of volitility) might be expected during the first week after issue.

Part II:

In Part II the information sought is more general in nature. That is, Part II studies new issues as a group rather than making a comparison of two samples from different market conditions. Here, in Chapter V, the two samples are synthesized and then subjected to the same tests used in Chapter IV. Therefore the same five questions may be asked from a non-comparative standpoint and similar expectations may be stated. Specifically: (1) Does the distribution of the one hundred mean price changes

approximate a normal distribution as might be expected? (2) How do the

total sample means compare to the individual bull and bear market sample

means? (3) Is the total mean weekly price change positive as other studies

have indicated it might be? (4) When (in which week) does the greatest

price change occur? (5) In what weeks does the greatest relative disper-

sion about the mean price change occur? As in Part I, it is expected that

the greatest gains and the greatest dispersion will occur in the first

week after issue.

These "in-total" results may be of greater value in a "sideways"

market or in other situations where general market conditions are deter-

mined not to be significant or relevant.

Underlying Theory

The rationale underlying expectations (1)-(3) for both parts is dis-

cussed in their respective chapters. Expectations (4) and (5) (involving

the timing and volitility of price movements) are based upon a phenomenon

peculiar to new issues as a group and deserves some comment here. The

expectation is that maximum price changes and volitility occurs in the

initial week after issue relative to subsequent weeks. The unique

phenomenon referred to is a tendency for a downward bias in the offering

price of new issues. That is to say that new issues tend to be under-

priced by the issuer or underwriter. The factors most significant in

causing this downward bias have been best summarized as follows:

1) Because of the unseasoned nature of the issue, the under-
    writer is uncertain of the public's evaluation of the
    firm's past earnings stream as well as the corporation
    outlook.

2) The probability that the issue will be "successful" is
    much higher if it is somewhat underpriced. In this

context "successful" is defined as an offering that is quickly sold, is possibly oversubscribed, and enjoys some increase in price soon after the offering. Such an offering results in satisfied customers for the underwriter as well as satisfied corporate stockholders.

3) A successful issue is one that sells quickly. In addition to satisfied customers, quick sale is important to the underwriter since he must borrow large amounts to purchase the issue. Investment banking firms have relatively small capital bases for the amount of underwriting undertaken and are, therefore, heavily dependent on rapid turnover of their capital. Rapid turnover, in turn, is contingent upon quick sales of all issues, especially new issues that are the high risk segment of the underwriting business.

4) Under SEC supervision underwriters are permitted to purchase and sell a new issue to stabilize the price. This stabilizing action is desirable because it reduces unnecessary price fluctuation but is time consuming and ties up underwriting capital. Such stabilizing action is minimized by a "successful" issue that does not require support.

5) In many cases the underwriters for new issues receive part of their fee in stock or receive options to purchase a large block of the new stock at a price near or below the original offering price. Therefore, they benefit directly from a "successful" issue.[3]

Of course, the downward biased offer price leads to a high initial week gain as the market reacts to the underpricing situation. Later when appraising the results of the study, the occasion will arise in which this a priori expectation in conjunction with the pessimism characteristic of a bear market will become quite significant.

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[3]Frank K. Reilly and Kenneth Hatfield, "Investor Experience With New Stock Issues," Financial Analysts Journal, Sep-Oct, 1969, pp. 73-74.

CHAPTER II

FINDINGS OF RELATED STUDIES

"New Issue Frenzy," "'Hot' Issue Rerun," "New Issue Market Booming,"
"New Issue Fever," and "Bull Market in New Issues" all represent recent
literature on the subject of new issue performance. Such titles[1] profess
the public's demand for new common stock security offerings in recent
years, particularly 1959 to 1961 and 1966 to 1969. Of course, the spec-
tacular price performance turned in by new issues has promoted numerous
journal articles with these and similar titles. This is particularly
true of the most recent new issue bull market periods. With few excep-
tions, the objectivity of these articles and studies (usually a simple
comparison of offer price to a market price some six months to a year
later) leaves much to be desired.

The S. E. C. Study

Indeed, only one comprehensive, in-depth study exists on new issue
market performance: the Securities and Exchange Commission's "Special
Study of Securities Markets."[2] This six part, four volume, somewhat ver-
bose but in-depth study was concerned with the 1959-1961 bull market in
new issues. Although the scope of the report covered the securities
market in general and particularly questionable practices, Part I, Chapter

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[1] See Bibliography for specific sources.

[2] House Document No. 95 of the 88th Congress, 1st Session.

IVB, "New Issues" was specifically concerned with the 1959-61 new issues bull market. Other references to the new issue market are diffused throughout the sections dealing with the over-the-counter market, underwriter and investment banking practices and recommendations and conclusions.

Of particular interest to my endeavor are Sections 3, 4, and 5 of Part I, Chapter IVB entitled, "The 'Hot' Issue," "Past Offering Experience of Small Companies Going Public," and "Summary, Conclusions and Recommendations," respectively. Section 3, "'Hot' Issues" was directly concerned with (a) the price experience of new issues of 1959-62 and, (b) the causes of the premium offer prices and subsequent gains of the 1961 new issues plus two lesser related parts. The findings contained in Sections 3a and 3b deserve special attention here as pertinent background information.

Section 3a.: Price Experience of New Issues of 1959-1962:

Bull market of 1959-1961. In general, new issues, especially those considered "Hot," were in great demand during the period under study, both by the issuing underwriters and their public clients. "It was not uncommon for underwriters to receive, prior to the effective date, public 'indications of interest' for five times the number of shares available. Indeed, indications of interest received by the managing underwriters alone sometimes exceeded the total amount of the offering."[3]

Of the 1671 unseasoned common stock issues of the period, 1327 (79%) sold at a premium immediately after offering and 1103 (66%) sold at premiums one month after offering. The proportion of new issues reaching

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[3]Ibid., p. 515.

immediate premiums and one month after offering premiums was at its peak in 1961 with 85% and 68% respectively.

Also of interest was that Regulation A offerings (assumed higher quality) rose to higher premiums than registered issues immediately after offering and one month later. Issues offered by the companies themselves were generally more successful in this respect than were secondary offerings.

Low offering prices were also in vogue. "More than half of the registered unseasoned common stock offerings in 1959, and around 60% in 1960 and 1961, were initially offered at less than $10.00,"[4] while the average price of New York Stock Exchange listed stocks in 1961 was $41.00. Also popular were certain "selected" industries' issues which comprised less than one fourth of the dollar volume of all unseasoned new issues in 1959-1961. The electronic and electrical equipment group was cited as the most popular, while popularity was increasing for scientific instruments and research, aerospace, photography, printing and publishing, and sports equipment and amusements industry issues. These "selected" industry firms tended to be small as might be expected; 85% with less than $5 million in assets. Data was gathered for and reference was often made to these "selected" industries' offerings--as a group called the "Hot Issues."

In 1961, seventy-five new issues more than doubled in price immediately after offering. Of these, forty-five were from the selected industries (15% of the total selected industries' issues) while thirty were from other industries (6% of that category). The median price rises for these "selected" industries' offerings was higher in all three years than for all new issues combined.

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[4]Ibid., p. 486.

On the supply side, figures showed that in the year ending June 30, 1962, 2307 registration statements were filed, of which 1377 (60%) were initial public stock offerings. In the previous year, fiscal 1961, 1830 registrations were filed, of which 958 (52%) were initial offerings. The comparable figures for 1950 were 496 and 112 (23%). The relationship of this response on the supply side to the speculative bull market fever of the period was of particular interest to the S.E.C., especially in their role of promoting market stability.

Effect of 1962 Market Break:

It was the conclusion of the S.E.C. that the speculative fever in the 1959-1961 bull market for new issues, particularly those in the "selected" industries, precipitated to a large extent the market decline of 1962. In support of this conclusion they compared the overall market decline with the decline in market prices for the 792 unseasoned common stock issues offered in 1961 for which price data was available at the end of September of 1962. The results were that only 22% of the new issues were selling above their offer price of 1961 even though 85% of these had sold at a premium immediately after offering. The groups which had accrued the largest gains after offering (the "selected" hot issues) turned in the worst performance in the market decline. Only 11% of this latter group showed price increases over their offering prices. Likewise, of those issues that had originally doubled in price in 1961, 65% were selling below offering price in September, 1962. The median decline from offering price was 40% for all new issues and 62% for Regulation A issues in the "selected" industries. These declines were compared to "average stock

market prices, which fell about 22% from their peaks in 1961 to September, 1962."[5] The S.E.C. Stock Price Index was the market reference.

Section 3b. Causes of the Premium:

The S.E.C. Special Study investigated the causes for the 1959-1961 bull market in new issues under three headings. These factors are elaborated upon here as they are frequently mentioned in later studies on subsequent market situations paralleling 1959-1961. Specifically, a number of sources have drawn analogies between the 1959-1961 and the 1966-1968 market periods or parts thereof--the latter period encompassing the dates of my study. The causes considered were market factors only--a technical rather than fundamental or economic analysis. The role of the trading firm was discussed as well as those factors limiting supply and increasing demand.

All phases of the initial public stock offerings of twenty-two selected companies were studied in detail to form the basis for this portion of the study.

1. Role of the trading firm:

(a) Because there was no delay between the distribution of customer allotments of new issues and the after market activity of making a market in the issue, customers often had an after-market quotation before they received confirmation of their allotment. Therefore, since most trading firms allowed cancellation prior to confirmation, initial quotations contributed to the "hotness" of issues already in demand by the public. In nine of the twenty-two issues studied, the managing underwriter

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[5]Ibid., p. 518.

made a market for the issue, and in all the issues the trading firm did so at one time or another.

(b) The trading firm entered the after-market as a speculator feeling no obligation to maintain a fair and orderly market. High volume is, of course, the prime objective for the commissions received.

(c) The trading firm sets the market price in effect. Ideally, the price they set is a reflection of the supply and demand situation to the public, but often that is difficult to determine. Indications of interest received plus buy orders are the only real indicators on the demand side. Immediate after-market selling pressure is very difficult to predict.

(d) Although solicitation or contracts made prior to the effective date of the registration statements are illegal, some retail and trading firms are actively induced to conduct immediate after-market promotion activities by the underwriters.

2. Factors limiting supply:

The number of shares of many new issues was small compared to most of the established listed securities. Distributors of new issues were accused of further restricting the supply to the public by the following practices.

(a) Underwriter selection of and allotment to customers favored initial placement in long term investment accounts. Turnover in these accounts is minimal and reduced the supply available to meet the initial demand surge.

(b) Many underwriters held stock after-market in "discretionary" accounts with trading firms, who preferred to wait for an after-market

quotation before they confirmed their orders. Again, supply is initially withheld from the public.

(c) Restrictions on resale were often imposed on the salesmen or customers of the trading firm if certain issues were sold prior to a certain date after offering date. This is really a formal declaration of (a) with the same supply limiting effect.

(d) Often customers were not notified immediately of their allotments in the new issues, preventing them from early trading. Delays in allotment notification amounted to several days in some cases.

(e) Similar to (d), delays in the delivery of certificates occurred--up to several weeks beyond commencement of the offering.

(f) "Free riding and withholding practices" were proven in several instances. In this case, portions of the new issue were withheld in employee, relative, personal, and other similar accounts by the underwriting firm until a premium price was attained at which time the stock was sold to the public.

3. Factors increasing demand:

With the supply restricted and controlled, slight increases in demand can have a dramatic effect. According to the S.E.C. Special Study, this is exactly what happened in 1959-1961, and the demand was stimulated in the following two ways.

(a) Active, immediate after-market sales efforts and solicitations by broker/dealers was common in 1959-1961.

(b) "Market letters, advisory recommendations, articles in the financial press and other planned publicity"[6] were employed in the immediate

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[6]Ibid., p. 535.

after-market by underwriters and trading firms alike. Publicists were often cited as receiving allocations of the "hot" issue for their efforts. Needless to say, these "allocations" were subsequently sold at the premium that these publicity firms or individuals helped to create.

The remainder of Section 3 of the Special Study was concerned with conclusions and recommendations of a regulatory nature and not directly germain to this report. It is in a way a sad commentary on an excellent report that to date only one of these fifteen separate recommendations has been adopted. That recommendation is a minor one in which dealers were required to extend the period in which they must deliver prospectuses to customers from forty-five to ninety days.[7]

Two Subsequent Price Performance Studies

Literature on the subject of new issue price performance has been limited generally to short spectacular reviews of selected "hot" new issue price gains. Two contemporary studies of somewhat better quality deserve mention, however, for two reasons. First, they present an extension or updating of the S.E.C. price study although not nearly as comprehensive, or concerned with effects upon market stability. Second, they are contemporary to the time periods selected for my study and my intention is to avoid duplication with work already undertaken.

The Merrill, Lynch Study[8]

Several brokerage firms have completed studies on the new issues

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[7]"The More Things Change. . .," Forbes, Jul 1, 1967, p. 46.

[8]Merrill, Lynch, Pierce, Fenner and Smith, Inc., Reason for Concern-- Study of the New Issue Market, (10 page booklet), Feb., 1969.

market, emphasizing recent developments and making recommendations for prospective clients. Smith, Barney and Company published an appraisal of the 1965 new issue market based on their independent study and Merrill, Lynch, Pierce, Fenner and Smith, Inc., published, Reason for Concern-- A Study of the New-Issue Market in February, 1969.

The intention of Merrill, Lynch was to appraise the late 1968 "bull market for new issues" and to draw analogies to the S.E.C. Special Study of the 1959-1961 bull market. The period selected was from August 1 to October 31, 1968, and the following price data was assembled on the 154 initial public stock offerings of that period: offering price, first day closing bid price, and recent price (Jan. 14, 1969).

The results of their price study revealed that "all but fourteen of the 154 issues offered during that period went to premiums on the first offering day, and in many cases the premiums were substantial,"[9] and that about one third of the issues gained five or more points during the first day. Twenty issues, or 13% of the total, increased 100% or more on the first day of issue, and several climbed 200%. In relation to offering price, present prices (Jan. 14, 1968) showed nearly all the issues trading above their offering prices and one third selling for at least twice their offering price.

Merrill, Lynch observed the following similarities to the 1961-1962 market situation.

1. The companies commanding high price multiples have gone public in greater numbers than those less favored. The S.E.C. referred to the "selected" industries of 1961-1962, and Merrill, Lynch listed the "popular"

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[9]Ibid., p. 1.

industries of 1968. Merrill, Lynch cited computer and high technology,
nursing homes, franchise operations, and quick service restaurants as
"popular" issues.

2. The number of new issues brought to market rose sharply in 1968
from the previous year, although the number was less than for the 1961
record year. 1968 initial offerings numbered 230 of 422 total offerings.
Data is not available for the 1961 new issue totals, but a record 1196
common stock offerings were made that year.

3. As in 1962, many issues were new companies (unseasoned) but the
1968 issues were judged better quality for three reasons. First, there
were fewer low price issues: eight of 154 were offered at less than $3.00
per share in the 1968 period vs. forty-two of 118 in the first quarter of
1961. Second, the 1968 issues had higher asset values: $2.5 billion for
the 422 issuing companies in the 1968 period vs. $3.5 billion for 1196
companies going public in the 1961 period. Third, Merrill, Lynch stated
that price to earnings ratios were lower for the 1968 period seasoned
issues.

4. Nevertheless, the universal acceptance of new issues, new and
established firms, unjustified by earnings and/or prospects of earnings
was judged the principal similarity to 1961-1962.

As would be expected from a supplier, Merrill, Lynch did not cite or
criticize the supply limiting factors as did the S.E.C. Instead, they
concentrated upon public demand factors not previously mentioned. These
additional demand factors contributing to new issue bull markets are three.

1. A "getting in on the ground floor" attitude is prevelant among
many new issue buyers. This is the prime explanation for the rapid accep-
tance of unseasoned issues of a firm in an industry with a new product or
technology.

2. Spectacular performances by some new issues fan the interest in all new issues as a group.

3. Institutional emphasis on growth has resulted in a significant new customer for new issues. This is especially true for the new "growth funds." In 1961-1962, the public exerted the only significant demand.

Forbes' Studies[10]

Forbes magazine has done two recent price studies on new issues. The first study appeared in the July 1, 1967 issue and compared the first fifty-two new issues of 1967 (Jan 1 to Jun 15) to fifty new issues from the 1961-1962 period. Two lists of companies were presented with offering prices, high prices, percentage gain of high price over offering price, recent prices, and percentage change of recent price to high price (in the case of 1961-1962 issues) or offer price (1967 issues). The second, an updated study, appeared in the September 15, 1968 issue and included similar data for 1968 new issues from Jan 1 through August. In addition, it updated the fifty-two 1967 new issues of the first study period. In neither study were many computations or statistical tests accomplished. Only the raw data was presented together with the individual percentage changes indicated.

As is a common failing, the articles tended toward specific spectacular examples of selected issues' performances. However, a simple analysis of the data reveals the following.

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[10]"Bull Market In New Issues," Forbes, Sep. 15, 1968, pp. 53-5; "The More Things Change. . .," Forbes, Jul. 1, 1967, p. 17.

TABLE 1

RESULTS OF FORBES' STUDIES

	Total Issues	No. Gains: period end vs. offer price	No. Gains over 100% vs. offer price	Range of gains, losses	No. Gains over June, 1967 price
Jan 1 - Jun 15, 1967	52*	40	11	-18.7 to +306.3%	38
Jan 1 - Aug, 1968	108#	98	43	-45.0 to +866.7%	

*All offerings over $300,000 value
#All offerings over $1,000,000 value

The results are quite impressive, especially for the 1968 new issues. Of course, by eliminating the lower valued offerings (those below $300,000 in the 1967 period and below $1 billion in the 1968 period) Forbes probably eliminated a greater proportion of the worst performers. Nevertheless, the gains were quite significant in number and size. Further, the one year review of 1967 offerings revealed that thirty-eight issues, well over half, continued to gain a year after issue.

A further comparison with 1961-1962 data is somewhat meaningless as a market decline comparable to 1962 has yet to occur. Therefore, one is left with the comparison of bull markets alone. However, interestingly, a backward look at Forbes' fifty 1961-1962 issues reveals that twenty-eight of the fifty are below their 1961-1962 high prices and that fourteen are below even their offering price as of July, 1967.

Only one new contribution was made by Forbes to the list of factors affecting new issue market conditions. This was yet another questionable dealer practice taken to meet the rising demand. This is the practice of

underwriters and trading houses actively seeking out new eligible companies to make public stock offerings. As an example, a <u>Wall Street Journal</u> advertisement for D. H. Blair & Co., a New York Stock Exchange member firm was quoted as soliciting people who could "alert us to companies, whose owners you think would like to see a public market for their stock."[11]

<div align="center">The Reilly-Hatfield Study[12]</div>

The Reilly-Hatfield Study is a price performance endeavor published in 1969. The sample data, however, is from two earlier subperiods: December, 1963 to August, 1964 and January, 1965 to June, 1965. This places the sample two years subsequent to the S.E.C. study and prior to the <u>Forbes</u> and Merrill, Lynch studies. The studies reviewed, taken together, contain new issue sample price data including every year from 1959 through 1968 with the exception of 1962. In general, exclusive of 1962, the decade was one of rising prices.

The unique feature of the Reilly-Hatfield study with regard to the other studies reviewed is the application of formal research design utilizing statistical testing of hypotheses. The object of the study was to determine the price performance of <u>unseasoned</u> new issues relative to the rest of the stock market. Sample observations were compared to the Dow Jones Industrial Average (DJIA), the National Quotation Bureau's Over-The-Counter Industrial Average (OTC), and a selected random sample of fifty-three over the counter stocks (one for each new issue was selected on the day of that new issue). The formal hypothesis was stated as follows, "it

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[11]Ibid., p. 46.

[12]Frank K. Reilly and Kenneth Hatfield, "Investor Experience With New Issue Stocks," <u>Financial Analysts' Journal</u>, Sep-Oct, 1969, pp. 73-80.

is hypothesized that underwriters will have a downward bias in their pricing of new stock issues; and, therefore, investors in new stock issues should enjoy superior short and long-term returns relative to the market."[13] The hypothesis was accepted on both time counts. The actual testing of the hypothesis might be divided into the three following sections.

Section 1:

In this section, new issue prices taken on the first Friday after issue, the fourth Friday after issue and one year after issue were converted to percentage changes from the offering prices. The percentage changes were compared to the DJIA and OTC index data. New issue price performance was superior in every instance, and the relative extent of the gains was always substantially higher than the relative extent of the losses. From a comparison of first week results with fourth week results, it was determined that the "bulk of short-run adjustment was accomplished almost immediately after issue" with little change between the end of first week data and the fourth week. This indicates the critical short-run nature of new issue volitility which is a subject to be extensively researched in my study. Particularly, I will explore the price movements within and between weeks one through twelve after issue.

Section 2:

In this section, the sample of fifty-three new issues was "matched" by random selection from experienced OTC stocks (one for each new issue) and performances were compared. Again, the extent of gains over the extent

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[13]Ibid., p. 74.

of losses of new issues compared to the random sample, revealed superior
returns for the new issues in all three periods.

Section 3:

An alternative investment strategy (to short-term trading) was pre-
sented. The question was asked, does short-run performance indicate con-
tinued performance in the long-run? The decision rule was made to repur-
chase all of those of the sample that showed gains on the first Friday after
issue and again to repurchase those that showed gains by the fourth Friday
after issue. The results when compared to the DJIA and OTC average revealed
significant chi-square performance superiority of new issue price perfor-
mance over the DJIA and a lesser but considerable bettering of the OTC
average. Also this decision rule was claimed to reduce the risk involved
since only four of the thirty-two new issues reselected suffered losses,
whereas a much higher percentage of the total new issue sample showed one
month and one year losses.

The Reilly-Hatfield study is superior in methodology and research
design to the other studies reviewed. However, only four observations
(offer price, first week close, first month close, and one year close)
were made on each sample member for a short-run and a long-run analysis.
The results, while significant, may overlook important phenomena occurring
between these selected points of measurement. Contrasted is the S.E.C.
Special Study which was a mammoth data accumulating effort but lacked
formal statistical analysis. My study which is a happy medium, I hope,
is directed toward these specific shortcomings of prior short-run price
studies.

CHAPTER III

GENERAL METHODOLOGY

The Study

The study consists of two parts: (1) an analysis of new issue prices
of samples, two each from declining and rising market periods, and (2) the
total one hundred new issue sample analyzed in terms of price changes over
twelve weeks after issue, without regard to indexes or general market con-
ditions. A short discussion of general methodology applicable to both
parts of the study follows in terms of the research design employed and
the analysis of results obtained. Specifically enumerated are: (1) sam-
pling procedure, and (2) processing the sample data. The list of the one
hundred companies comprising the samples may be found in attachment 1.

The two recent market periods of declining prices that have been
selected for the study are periods 1 (Jul. 13-Oct. 5, 1966) and 3 (Jan. 3-
Mar. 27, 1968), and the two recent market periods of rising prices that
have been selected for the study are periods 2 (Jan. 18-Apr. 12, 1967)
and 4 (Sep. 18-Dec. 11, 1968). These periods are outlined in Figure I for
three indexes that were selected to represent general market conditions.
These indexes are: The Over-The-Counter Index, The New York Stock Exchange
Composite Index, The American Stock Exchange Price Level Index. The
specific sample periods selected registered consecutive monthly gains
(periods 2 and 4) or losses (periods 1 and 3) in terms of all three indexes.

FIGURE I

SAMPLE PERIOD INDEXES
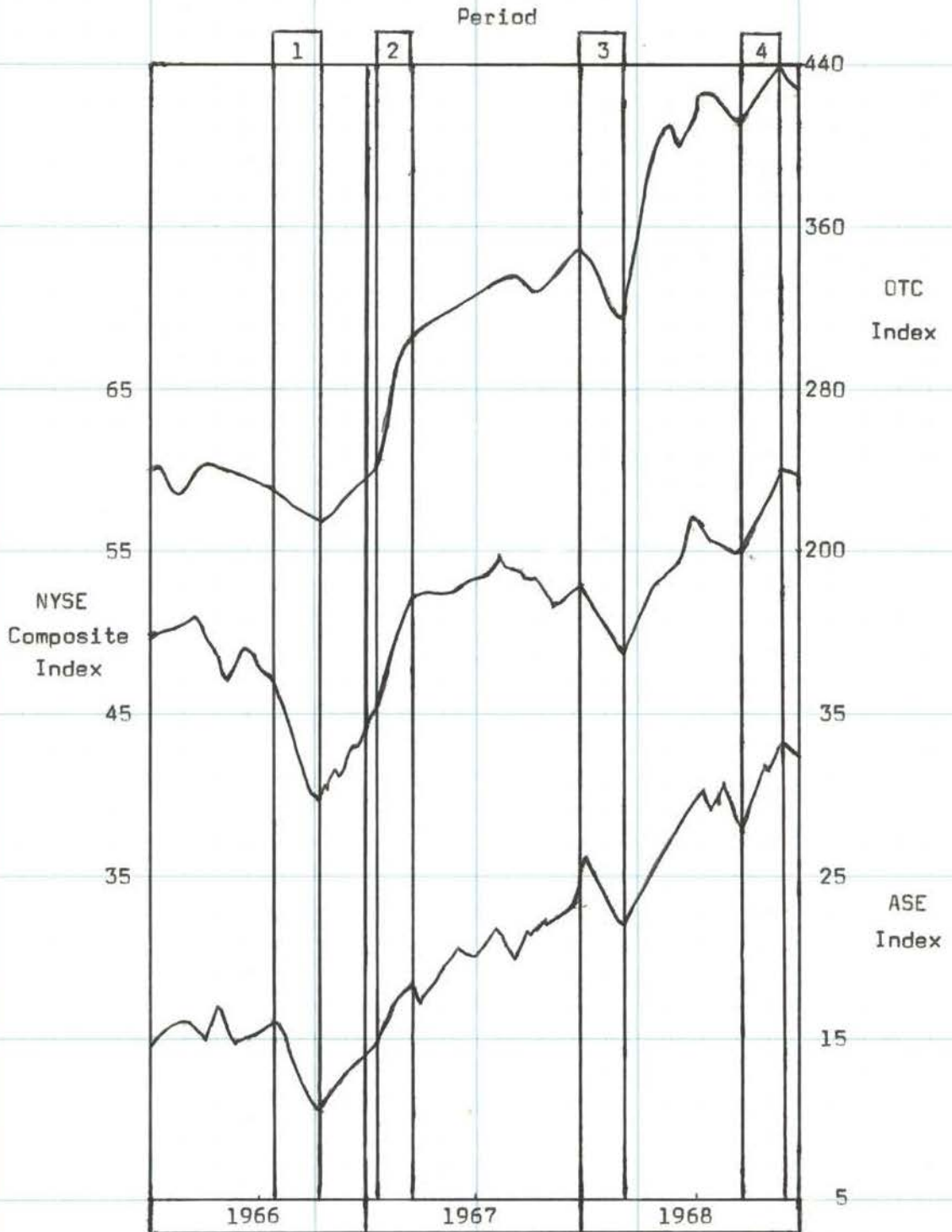
Weekly closing Wednesday prices have been gathered for the three indexes
to determine the bull and bear market periods.

For each period, weekly price data has been compiled for the first
twenty-five new public stock offerings made _during_ the period. Specifi-
cally, Wednesday closing bid prices were obtained as well as the initial
offering price for each new issue.

The first twenty-five new issues that were issued during the period
were selected for each of the four periods. If, as in the case of the 1966
period, there were not twenty-five issues that met a four week data history
requirement within the period, an additional number of new issues were se-
lected from the other period of similar market movement to total fifty
eligible issues for the market sample. In the case of period 1 (1966)
only twenty-two issues qualified, therefore, twenty-eight qualifying issues
were selected from the other declining market period (period 3, Jan-Mar,
1968). The appendix contains a company listing by market and period.

<center>Sampling Procedure</center>

The sampling procedure employed is an inclusive, stratified sampling
method. By definition, inclusion is limited to the first twenty-five issues
of each period to obtain maximum "in period" observations. The strata, or
homogeneous groups within the general population, are the two rising and
two falling market period samples, stratified on the basis of the three indexes
as discussed. Results based upon stratified samples have greater relevance
to their respective strata than if the entire population were sampled.[1]

---

[1]Stephen P. Shao, _Statistics for Business and Economics_ (Columbus, Ohio:
Charles E. Merrill Books, Inc., 1967), p. 324.

Processing the Sample Data

The first of several computer programs ulilizing the Fortran IV com-
piler language was written to convert the weekly prices into percentage
price changes. An offering price and twelve subsequent weekly prices com-
prise the raw data. Twelve weekly percentage price changes for each of
the one hundred companies sampled resulted. These percentage price
changes formed the input data for the majority of the tests. The use of
percentage weekly price changes, of course, converts the raw price data to
comparable terms.

This input data was processed in two ways for use in both parts of
the study. First, to analyze the twelve week magnitude and direction of
price movements, the twelve week mean of each of the one hundred company
percentage price changes was computed. These mean weekly percentage price
changes were used for all one hundred firms in Part II and as two fifty
member stratified samples, one each from rising and falling markets, for
Part I.

Second, the average of the two fifty sample mean percentage price
changes were calculated for each of the twelve weeks. The mean of the
price changes from offering price to first Wednesday bid close through
the mean price changes between the eleventh and twelvth weeks after issue
yielded these twelve weekly means. Together with the standard deviations
for each week, these standard measurements were compared within and between
the two market period samples. This latter comprises the volitility
analysis portion of the study.

CHAPTER IV

PART I RESULTS--BULL AND BEAR MARKET SAMPLE COMPARISONS

The objective of this chapter, Part I of the study, is to compare
the bull and bear market samples. These fifty member samples will be ana-
lyzed in terms of differences between them. A direct comparison to general
market indexes will not be attempted since an unstratified study of this
type was accomplished by Reilly and Hatfield. The bull and bear market
samples are compared in two separate ways. In both instances the weekly
percentage price changes constituted the input data.

The first manner of comparison is in terms of the distribution and
extent of mean weekly gains or losses. Here, we seek to discover whether
significant differences exist between the means of the bull and bear mar-
ket samples. The type of statistical test employed is dependent upon
whether the distribution of the fifty sample means is normal for the two
samples. Therefore, a chi-square test is first employed to test for good-
ness of fit to a normal distribution. The assumption is made based upon
the results of this test that the two sample means are normally distributed.
On that basis, the parametric T-test is selected to test for significant
differences between the bull and the bear market sample means. The hypo-
theses to be tested by this portion of Part I are:

H_1 = That there is no significant difference between the distribution
of the fifty means of each of the samples and a corresponding set of normal
or theoretical values. The acceptance or rejection of this hypothesis will

26

determine the type (parametric or non-parametric) of test to be employed to test H_2.

H_2 = That the mean of the weekly percentage price changes will differ significantly between the two samples. This is expected since the samples are homogeneous with regard to their origin in rising and falling market conditions. Further, the bull market mean is expected to be positive and the bear market mean is expected to be negative. The latter expectations are not formally included as part of the hypothesis, because they are based upon the market from which the samples were selected and do not involve a direct comparison of the two samples.

The second manner of comparing the two samples is a volitility analysis. Again the two samples are compared to each other, but on a weekly basis. First, a comparison is made of mean gains or losses for each of the twelve weeks of the bull and bear market samples. Second, the relative dispersion about these means is computed for each sample using the coefficient of variation. This tells one _when_ the greatest mean gains or losses occurred and the relative variability about each weekly mean. The specific hypothesis tested is:

H_3 = That the greatest one week mean price changes will occur during the first week after issue. The expected acceptance of this hypothesis is based upon the results obtained by the studies reviewed in Chapter II. It will be recalled that invariably these studies revealed the greatest price movement in the first week after issue. Additionally, it is expected that the relative dispersion will be greatest in the initial week so that when considering both measured components of volitility, week one will rank the highest in each regard. Volitility (percentage price changes and dispersion) in general is expected to decrease generally from week one to week twelve.

The results of the study will be explored for possible substantiation or refutation of these expectations.

Measuring Distribution and Extent of Gains or Losses

Chi-square Test:

This part of the study involves the comparison of the two samples from the two population strata (rising vs. falling markets). These samples of fifty each are tested to see if a normal distribution about the mean of their average weekly percentage changes exists. These fifty means of the weekly percentage price changes for each sample are the input data for the chi-square (X^2) test of goodfit to a normal distribution.[1]

The hypothesis tested by the chi-square test is H_1 : That there is no significant difference between the set of observed values of each of the samples and a corresponding set of normal or theoretical values. Since stock price changes in general are believed to approximate a normal population, we would expect each sample from this population to have an insignificant X^2. Of course, as will be tested later, one would expect the means of the average price changes to be significantly different between samples. However, here the expected result is a normal distribution about the mean in each case.

The results from testing for chi-square are in Tables 2 and 3.

---

[1]$X^2 = \sum \left[\frac{(O-E)^2}{E} \right]$ where O = observed values or the 50 means; E = expected values based on a normal distribution. The specific program is contained in an unpublished pamphlet "Goodfit: A Program for X^2 Goodness of Fit Tests Using Normal or Uniform Distributions," by Joe Potts, University Computer Center, Oklahoma State University, August 28, 1969. Fortran IV Compiler Language is used for the IBM 360 Mod 50 hardware as is the case for the T-test program and other programs utilized to process data for this study.

TABLE 2

CHI SQUARE RESULTS—BEAR MARKET SAMPLE

| INTERVALS | | FREQUENCIES | |
FROM	UP TO	OBSERVED	EXPECTED
-9999999.00000	-0.02500	7	8.08861
-0.02500	0.00000	16	8.85653
0.00000	0.02500	8	11.01812
0.02500	0.05000	9	10.06208
0.05000	9999999.00000	10	11.55122

DF= 2 CHI-SQUARE= 7.05542

MU= 0.01766 SIGMA= 0.04496

TABLE 3

CHI SQUARE RESULTS—BULL MARKET SAMPLE

| INTERVALS | | FREQUENCIES | |
FROM	UP TO	OBSERVED	EXPECTED
-9999999.00000	0.02000	20	14.33335
0.02000	0.04000	7	9.41411
0.04000	0.06000	8	9.70204
0.06000	0.08000	9	7.82643
0.08000	9999999.00000	6	8.36433

DF= 2 CHI-SQUARE= 4.00224

MU= 0.04246 SIGMA= 0.04041

For the bear market sample, the chi-square statistic is 7.055 and the degrees of freedom are equal to 2. From a standard chi-square table, the probability that the data is from a normal distribution is found to be about .03. In the case of the bull market sample, the chi-square value of 4.00 and degrees of freedom equal to 2 indicate a .15 probability that the data is from a normal distribution. Results are judged to be significant at the .01 level.

With a 3% and 15% chance of normalcy, H_1 cannot be rejected with an .01 level of significance. On this basis, a normal distribution is assumed and a parametric test will be employed to test the differences between the means of the two samples.

T-test:

Since the difference between two sample means drawn from assumed normal populations is sought, the parametric T-test[2] is appropriate.

The specific T-test applicable is one that compares unpaired sample means to see if they are significantly different from each other. H_2 stated in essence that since the fifty observations from one sample originated in rising markets and the fifty observations in the other sample originated in falling markets, one would expect the two sample means to be significantly different. The criterion for acceptance of this hypothesis will be a probability of difference due to randomness of .05 or less.

The results obtained are a T-statistic of 2.90 with degrees of freedom equal to 98. The resulting probability that the means are from the same population is .01 for the two tailed test. Therefore, H_2 (that the two

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[2] Richard Nearling, "T-Statistic," an unpublished pamphlet available through the University Computer Center, Oklahoma State University, June, 1968.

means are significantly different) is accepted. A scatter diagram (Figure II) illustrates the relative location of these observations. By the cluster locations of X (Bear Market Observations) and O (Bull Market Observations) the differences in central tendency between market observations is made visually obvious.

It is interesting to note at this point that while significantly different, both means are positive. The mean weekly percentage price change for the bear market sample is +1.76% per week and for the bull market sample is +4.25% per week. While the declining market situation turned in worse results for new issues, compared to the advancing market, the average weekly price change from offer price until twelve weeks later was a gain.

Of further interest is the standard deviation about the mean. For the bear market this indicator of variability was .0449 and for the bull market .0404. This indicates similar weekly variability for new issue prices up to at least twelve weeks after issue, regardless of general market conditions. Since these are means of the twelve weeks data, this is the only conclusion that can be drawn now. Later, an analysis of the percentage price changes for each week will allow the pinpointing of the specific week(s) in which the majority of variation occurs.

Percentage of Weeks Gain or Loss Analysis:

Since mean price movements and beginning vs. closing comparisons obscure individual weekly performances, a 1200 observation gain or loss matrix is constructed for the two samples over twelve weeks. The totals of weekly gainers (+), losers (-) and no changes (0) is summarized in Table 4 for: (1) each period, (2) each market, and (3) total sample, the

FIGURE II

AVERAGE WEEKLY PRICE CHANGES FOR 100 COMPANY SAMPLE

X = Bear Market Observation
O = Bull Market Observation
M = Mean of Market Samples

M = 1.76

M = 4.25
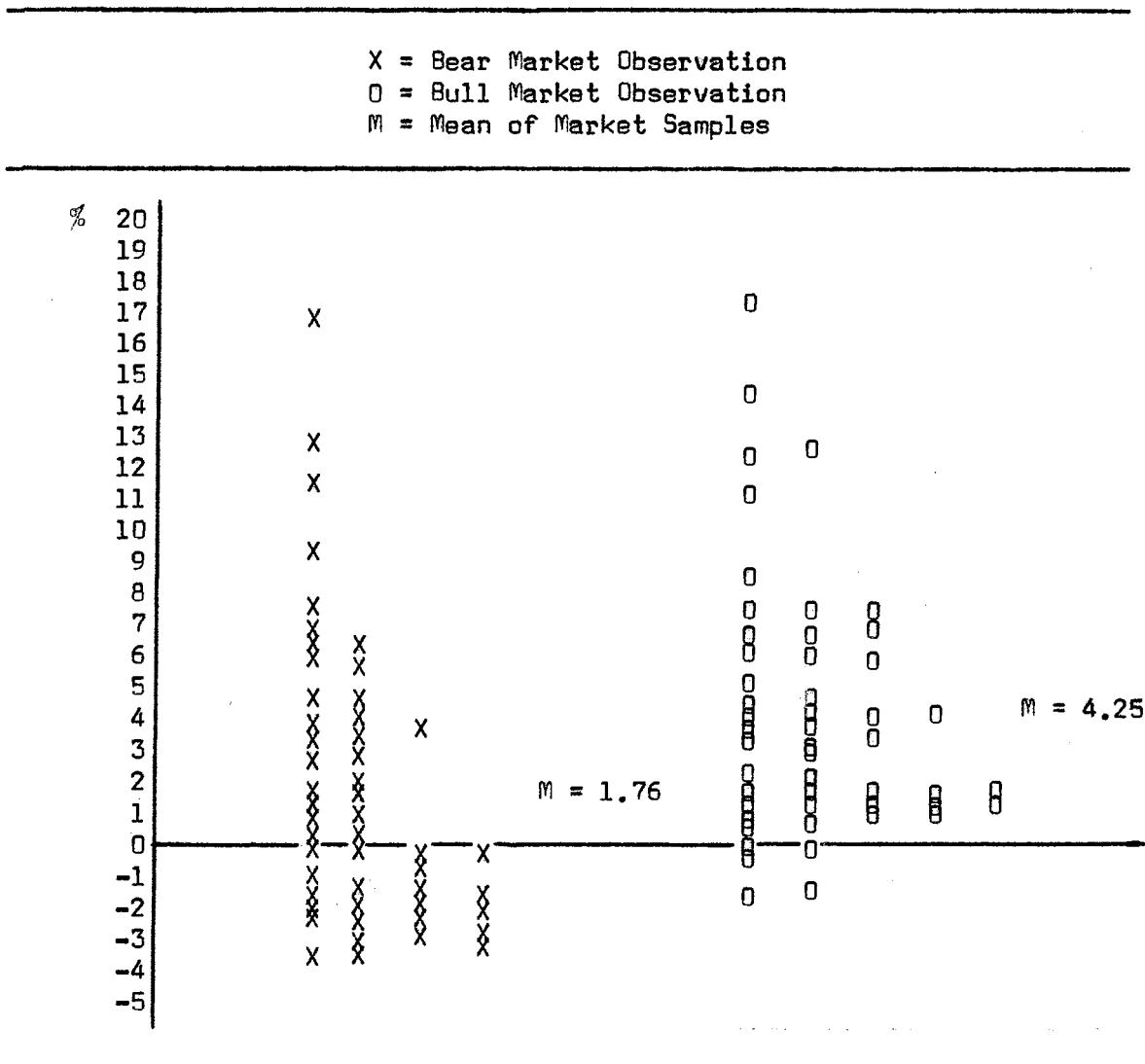
latter relevant to Part II of the study. This completes the comparison of the _extent_ of gains and losses over the total period for the bull and bear market samples.

"Totals" referenced in Table 4 are the sums of the weekly gain (+), loss (-), or no change observations (0) for the twenty-five issues in each of the four respective periods and their percentage breakdowns. "Market totals" are the summation of the two periods' observations originating in similar (declining or advancing) markets. Each "market total" reflects 600 +, -, or 0 observations (fifty issues over twelve weeks). "Grand totals" are those for all 1200 observations covering twelve weeks, one hundred issues, four periods and both markets.

A similar matrix was completed for the index observations. The National Quotation Bureau's Over the Counter Index of thirty-five industrials, the New York Stock Exchange Composite, and the American Stock Exchange Index, weekly price changes in terms of the same +, -, or 0 criteria, supplied the observations for the selected twelve week periods. "Totals," "market totals," and "grand totals" were also compiled for these chosen market indicators, again summarized in Table 4.

Significant to the comparison of bull and bear market samples is the percentage number of weekly gains (+), or losses (-): (1) between the two samples; and (2) between the indexes and the samples. In the first instance, the percentage of weekly gainers and losers is almost exactly reversed for the two market situations (35% +, 52% -, 11% no change for the bear market, and 53% +, 38% -, and 9% no change for the bull market). This adds support to the normal expectation that the general market situation will influence the short-run (twelve weeks in this case) price performance of new issues.

TABLE 4

NUMBER OF WEEKS GAINS VS. LOSSES

	Number of Observations			% of Total		
	+	-	0	+	-	0
New Issue Totals						
Period 1	100	154	46	33	52	15
Period 3	120	155	25	40	52	8
Period 2	168	106	26	56	35	9
Period 4	148	124	28	49	41	10
Market Totals						
Declining (Period 1 & 3)	220	309	71	37	52	11
Rising (Period 2 & 4)	316	230	54	53	38	9
Grand Totals						
All 100 observations	536	539	125	45	45	10
Index Totals						
Period 1	16	29		36	64	
Period 2	12	20	1	38	62	
Period 3	38	7		84	16	
Period 4	24	9		73	27	
Market Totals						
Declining (Period 1 & 3)	28	49	1	36	64	
Rising (Period 2 & 4)	62	16		79	21	
Grand Totals						
All 3 indexes	90	65	1	58	42	

The second meaningful comparison here is between the new issue price performance and the general market performance as measured by the three selected indexes. In the bear market periods, the new issues narrowly out-performed the market in terms of percentage number of weeks of gains over losses (37% +, 52% -, and 11 no change vs. 36% +, 64% -). However, in the bull market periods, the general market significantly out-performs the new issues (79% +, 21% -, vs. 53% +, 38% -, 9% no change). At this point it is important to recognize that only the percentage number of weekly gains or losses is measured in this portion of the study. An examination of these gains or losses within and between weeks is considered by the next section, "Volitility Analysis."

Volitility Analysis

The relative degree of change of the sample price data "across the sample matrix" was just considered. It has provided a general comparison of the distribution and extent of weekly gains and losses. However, this reveals little in terms of the timing and the volitility of these price movements. In order to examine these aspects, means and standard deviations were computed for each of the twelve weeks with respect to the fifty member samples. These twelve means and standard deviations from the means form the data input for this analysis.

Variability Between Weeks:

The testable hypothesis is H_3: that the greatest one week change in new issue prices will occur in the initial week (from offer price to first week Wednesday close). Thereafter, weekly differences in the degree of gains or losses should be insignificant within each sample strata (rising

or falling market). This hypothesis is based upon the results of the Reilly-Hatfield study reviewed in Chapter II. Briefly, the authors concluded that maximum gains occurred in the first week after issue. Although their sample was not stratified, there is no reason to believe a homogeneous grouping by market conditions would alter their results.

Graphical illustration in the form of histograms dramatize the results best. These compare mean gains or losses in each week for: (1) the fifty member declining market sample, and (2) the fifty member rising market sample.

Figures III and IV dramatically illustrate why H_3 must be accepted for both the bull and bear market situations. In both markets, new issue prices averaged a 20% or more price change from opening price to first Wednesday close. Percentage price changes for subsequent weeks varied from .6% to 5.2%--mostly down in the bear market and up in the bull market as might be expected. Unexpectedly, however, the largest one week percentage gain (+29.1%) came in the first week of the bear market periods. The first week of the bull market periods reflected the second largest mean gain (+21%). This indicates that price movements of new issues are independent of general market movements and predictably upward during the first week after issue. This indication will come under further scrutiny in Part II, as it seems to be a general phenonenon rather than a market phenomenon.

Variability Within Weekly Data:

The second part of the volitility analysis of new issue price changes during bull and bear market conditions involves the measurement of relative dispersion. For this measure the standard deviation is needed since the

FIGURE III

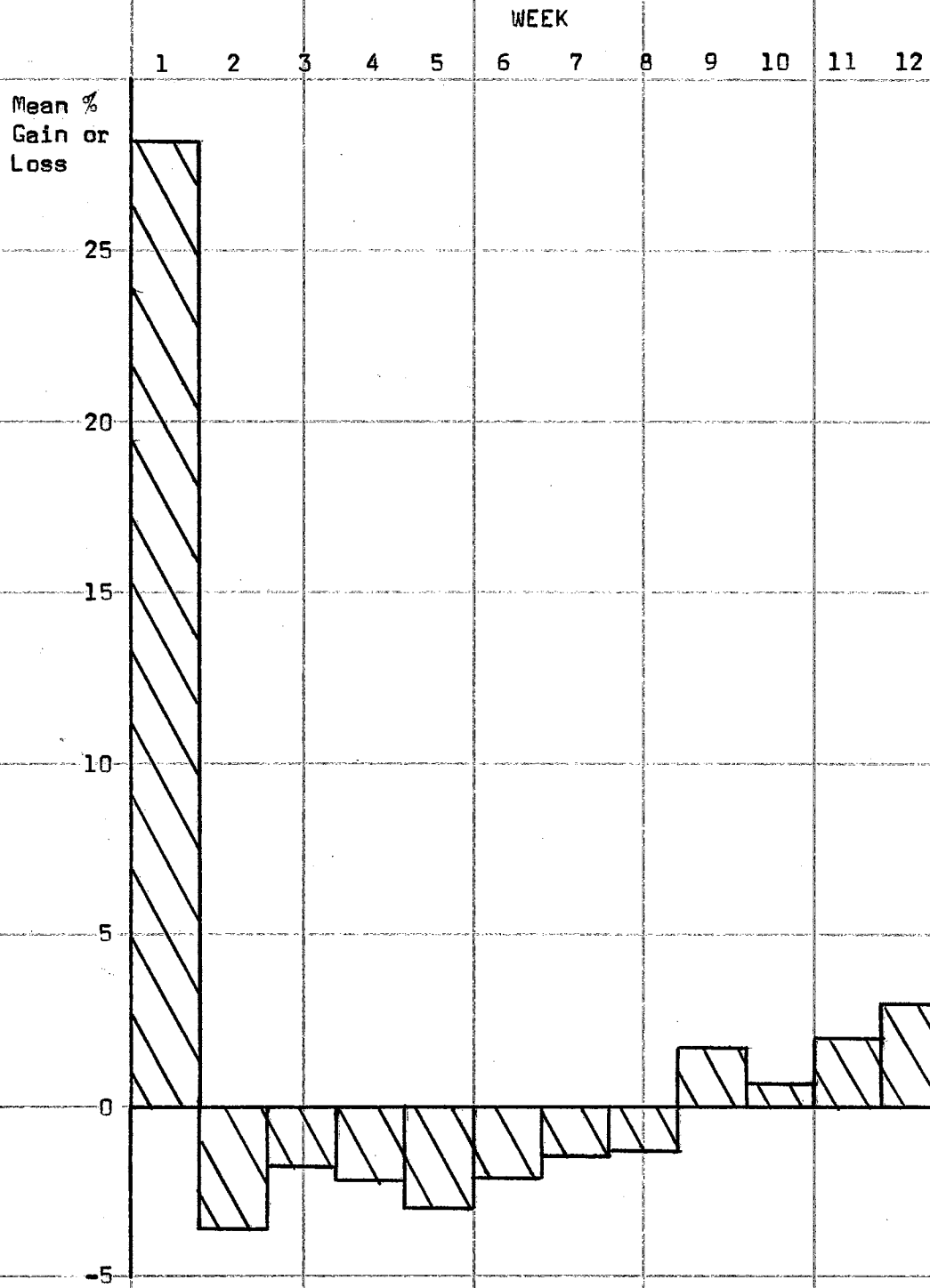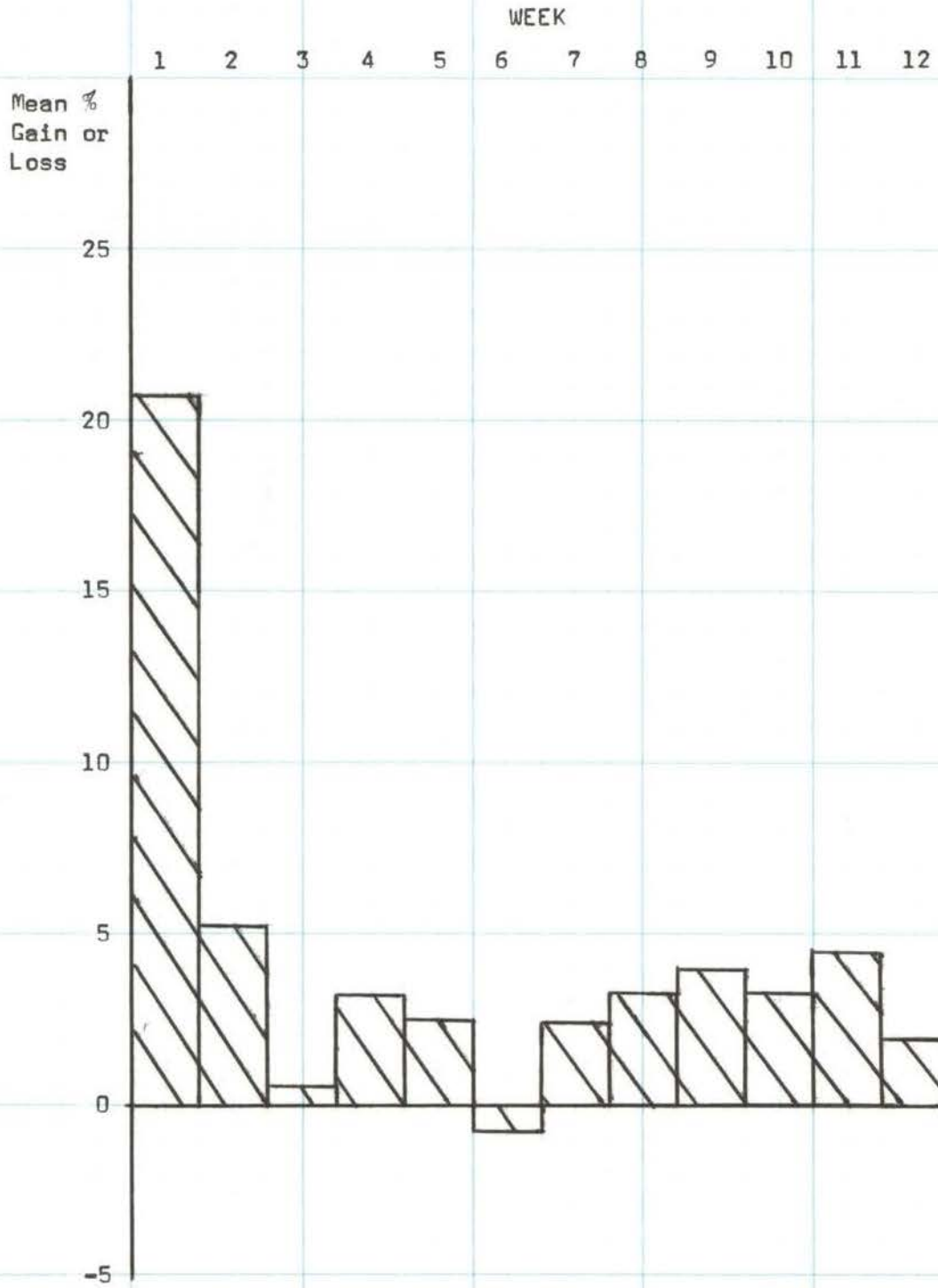BEAR MARKET SAMPLE--MEAN GAIN OR LOSS BY WEEK

FIGURE IV

BULL MARKET SAMPLE--MEAN GAIN OR LOSS BY WEEK

objective is to determine the _relative_ movement of prices around each of

the twelve weekly mean price changes. A low standard deviation and dis-

persion around the mean would indicate more confidence is warranted in ex-

pecting any single value will approximate the mean. Since the weekly

means themselves vary from -3.6% to +29% a relative dispersion value must

be calculated for meaningful comparison. If the means were all the same,

direct comparison of the standard deviations would be sufficient. The

relative dispersion value used is the coefficient of variation[3] which is

the quotient of the given measure of dispersion (the standard deviation)

divided by the weekly mean from which the deviations were measured.

Figures V and VI illustrate the results.

During the bear market, the dispersion about the weekly means varied

from .023 in week six to 2.54 in week ten. The greatest relative dis-

persion (uncertainty of attaining the mean) occurred in weeks three, seven,

ten and eleven. With the notable exception of week three, the first half

of the period (weeks one through six) had relatively _low_ dispersion. This

is _not_ what was expected as maximum volitility (both mean percentage gain

and dispersion about the mean) was predicted in the initial weeks after

issue, particularly the first week.

The results from the same calculations for the twelve week bull mar-

ket sample are somewhat different than those obtained from bear market

sample data. In this case, the dispersion varied from .052 in week five

to 1.97 in week three, indicating somewhat _less_ volitility than during the

bear market in terms of the range of the dispersion values. As in the bear

market period, relative dispersion about the mean was high in the third

---

3$V = \dfrac{S_1}{\overline{X}_1}$ where S_1 = standard deviation from $\overline{X}_1$ in week$_1$; $\overline{X}_1$ = the mean of the 50 observed price changes in week 1.

FIGURE V

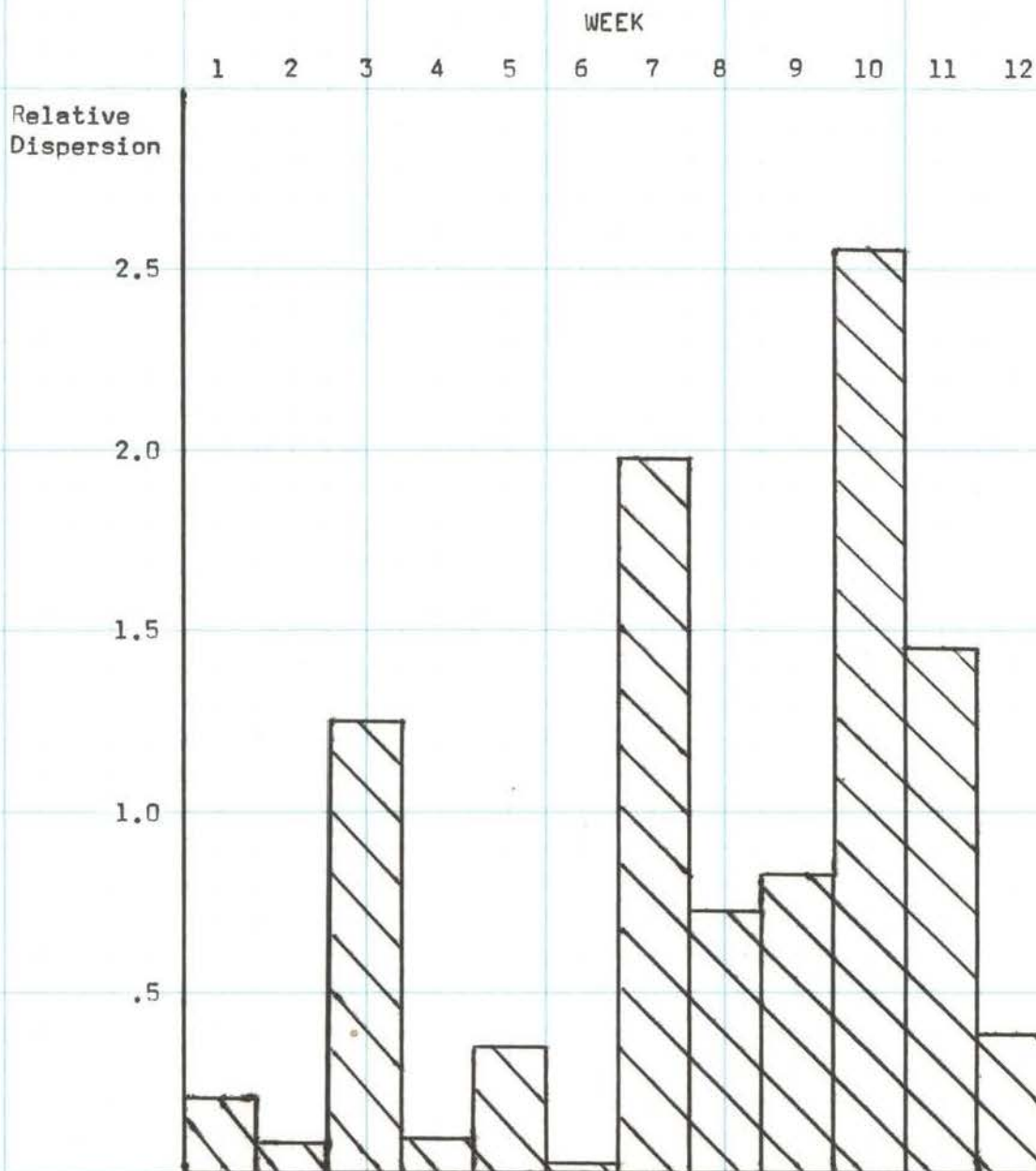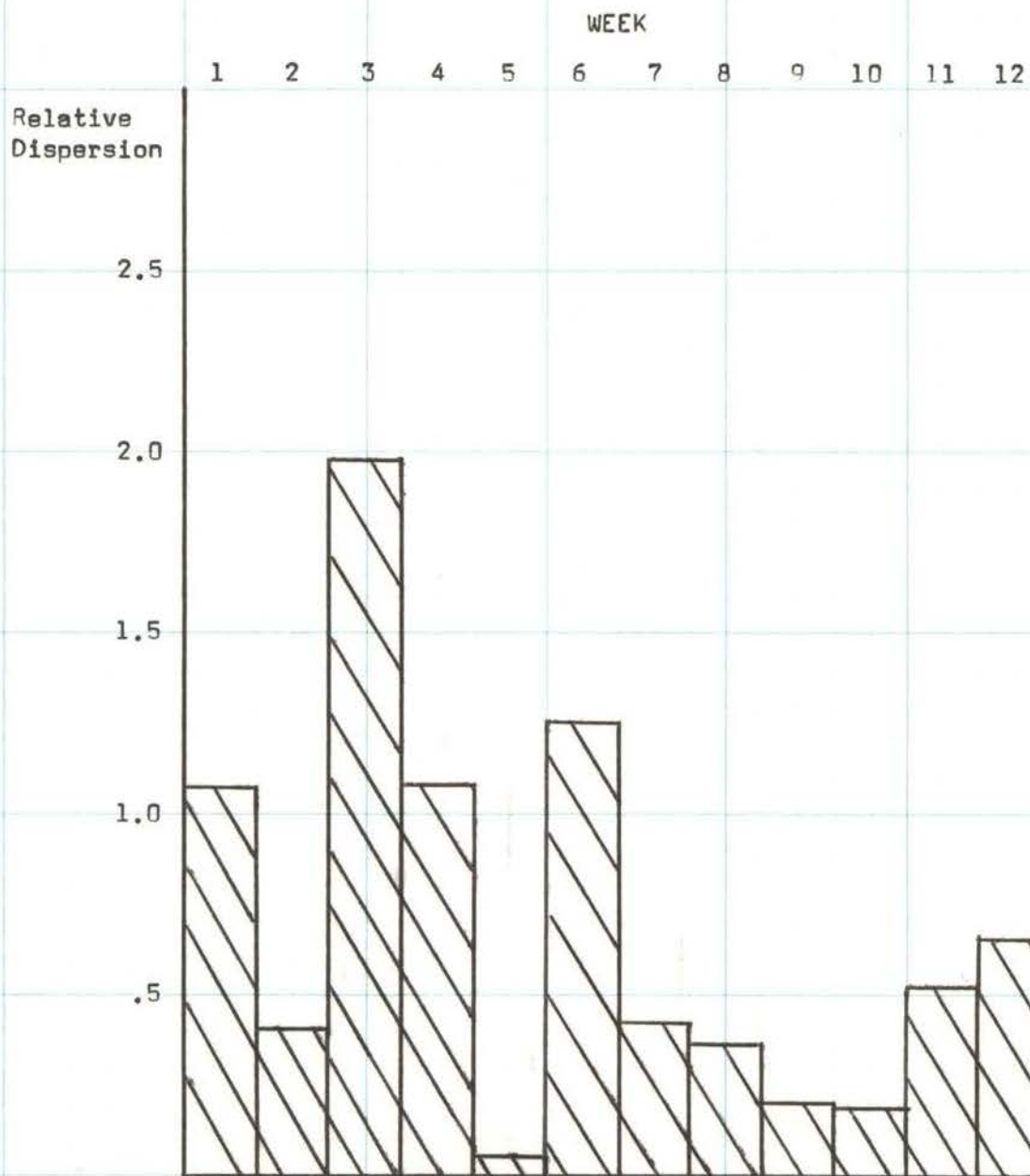RELATIVE WEEKLY DISPERSION--BEAR MARKET SAMPLE

FIGURE VI

RELATIVE WEEKLY DISPERSION--BULL MARKET SAMPLE

week after issue. However, aside from week five, the first half of the period (weeks one through six) had _more_ dispersion than the last half of the period (weeks seven through twelve). While this more closely coincides with expectations, week one itself does not contain the greatest amount of dispersion and indeed ranks only fourth, having less dispersion than weeks three, five and six. As in the case of the bear market sample, maximum dispersion was expected in week one.

Tentative Conclusions:

These results indicate that _in general_ the greatest new issue price volitility occurs in week one in terms of absolute gains or losses for both the bull and bear market samples. However, in terms of the in-week relative dispersion, the greatest volitility occurs in the first six weeks during bull market conditions and during the second six weeks during bear market conditions. Combining these two facts, one is faced with the seemingly unlikely prediction that the greatest chance of gain, with the lowest dispersion, occurs in the first week after issue of a _bear_ market. Otherwise, however, returns in the bull market are generally superior in terms of magnitude with less dispersion as is predictable.

CHAPTER V

PART II RESULTS--TOTAL NEW ISSUE SAMPLE

Measuring Distribution and Extent of Gains or Losses

In Part I the two market samples were analyzed and compared. Now
the samples from all four periods and both rising and falling markets
will be synthesized and tested as a total sample. As in Part I, this
total sample will be analyzed in two ways using weekly percentage price
changes as input data. First, the distribution and extent of mean weekly
gains or losses is considered. From the input data it can be seen that
the range of average weekly gains or losses is from -3.5% to +17.7% per
week (Appendix). Between these ranges some distribution exists for the
total sample. Knowledge of this distribution permits further meaningful
analysis of the data and forms the basis for certain expectations and
conclusions. Appearances from Figure II indicate that the weekly gains
or losses for the total sample more closely approximate a normal distri-
bution than either the bull or bear market samples taken individually.
The latter, of course, were both assumed (on the basis of chi-square test
results) to approximate a normal distribution in the previous chapter.
Similar testing will now be applied to the total sample. The testable
hypotheses in this portion of Part II are:

H_4 = That there is no significant difference between the distribu-
tion of the one hundred mean percentage price changes of the total sample

and a corresponding set of normal or theoretical values. This hypothesis is identical to H_1, only it applies to the total sample as opposed to the individual market samples.

H_5 = That the distribution of the total sample means _more_ closely approximates a normal distribution than either of the two market sample means taken separately. Since the total sample is composed of twenty-five new issues from four different sample periods equally distributed between rising and falling markets, it should be more representative of the general stock market population. The price movements of the total population of stocks is widely believed to closely approximate a normal distribution.

As was pointed out in Chapter II, previous studies have indicated that new issue prices have been more "bullish" than general stock market indicators. This implies nothing about the distribution of gains or losses. It does imply, however, that the mean gains or losses are more likely to be positive for the new issue segment of the general stock market. Indeed this premise is the basis for most of the sensationalist literature referenced in Chapter II. This leads to the next hypothesis.

H_6 = That the mean of the weekly percentage price changes will be positive for the total sample.

The second manner of analysis is also similar to the type of analysis conducted in Part I. This is a volitility analysis, and as in Part I, volitility is said to have two components. First, variation in the mean weekly price changes for the twelve week sample period is examined in and between each week. Second, the relative dispersion of values about each mean is calculated for each week. Volitility is again considered to be composed of variation between the weekly means and variation

around the weekly means. The hypothesis tested in this portion of Part II is:

H_7 = That maximum volitility will occur in the first week after issue. This hypothesis is the same as H_3, and the basis for its accep-tance (through statistical testing of emperical data) is the same as that given for H_3. Again, the only distinction between these hypo-theses is that the results of the former apply to new issues in general while the latter results apply to specific different market conditions and are treated comparatively. The anticipated results are similar in both cases, however, as market conditions are not necessarily thought to affect the timing of short run volitility in stock prices. There-fore, it is anticipated that the greatest volitility will occur in week one.

Measuring Distribution and Extent of Mean Gains and Losses

Chi-square Test:

The results of the chi-square test of goodness of fit to a normal distribution will determine the acceptance or rejection of H_4. Addition-ally, when compared to the two market sample means, it will determine the acceptance or rejection of H_5. The value for chi-square (x^2) is computed according to the same formula used in Chapter IV ($x^2 = \sum \left[\frac{(o-e)^2}{e} \right]$). The results from the chi-square test of the total sample are summarized in Table 5.

TABLE 5

CHI SQUARE RESULTS--TOTAL SAMPLE

| INTERVALS | | FREQUENCIES | |
FROM	UP TO	OBSERVED	EXPECTED
-9999999.00000	-0.01600	13	13.77499
-0.01600	-0.00400	8	7.17937
-0.00400	0.02400	32	22.75064
0.02400	0.04400	17	17.93230
0.04400	0.06400	10	15.55929
0.06400	0.08400	10	11.01281
0.08400	9999999.00000	10	9.65230

DF= 4 CHI-SQUARE= 6.03822

MU= 0.03006 SIGMA= 0.04432

The chi-square statistic is 6.038 with degrees of freedom equal to
4. Reference to a standard table of chi-square values and corresponding
probabilities reveals that the probability that the total sample is from
a normal distribution is about .19. This figure does not indicate with
absolute assurance that the total mean price changes are normally distri-
buted. Indeed, an 81% chance exists of non-conformance to a normal dis-
tribution. Therefore, while H_4 cannot be rejected (as was the case for
the similar H_1), it cannot be unequivocally accepted. The results are
interpreted only to mean that H_4 will be assumed true based upon the same
acceptance criterion used on H_1. That is that the results are judged to
be significant at the .01 level and that .19 considerably exceeds this
minimal specification.

H_5 stated that the distribution of the total sample means will more closely approximate a normal distribution than either of the two component market sample means. The respective probability values are: bear market sample, .03% chance of normalcy; bull market sample, .15% chance of normalcy, and the total sample, .19% chance of normalcy. Clearly from these chi-square results H_5 must be accepted. Table 5, chi-square results for the total sample, is histogramed in Figure VII for better visual representation of the frequency distribution of the one week mean percentage gains or losses. While the mean of .0301 is somewhat larger than the mode, it is slightly smaller than the median. The distribution is slightly skewed to the right and the range of the distribution is from -.035 to +.177. A similar distribution exists for the bull market sample. The bear market sample also is skewed to the right (more so than the total sample). As might be expected both the mode and the median are lower values than the mean for the skewed bear market sample. The standard deviation is between .040 and .045 for all three distributions—an interesting consistency.

H_6 hypothesized that the mean weekly price changes for the total new issue sample would be positive. It will be recalled from Chapter IV that the mean weekly price change for the bull market sample was +4.25% per week and +1.76% per week for the bear market sample. Obviously then, the total sample registered a positive mean weekly price change (equal to 3.01% per week), and H_6 must be accepted. Carried further a 3.01% price increase per week amounts to a 36% average gain for the twelve week sample period. A buy and hold for twelve weeks policy should on the average yield gross capital gains of 36% on initial investment. This assumes, of course, that all purchases are made at the offer price and all sales are made in the

FIGURE VII

FREQUENCY DISTRIBUTION OF PRICE CHANGES

Total Sample

Mean
.0301

Mean Weekly Gains

Bear Market

Mean
.0176

Mean Weekly Gains

Bull Market

Mean
.0425

Mean Weeily Gains
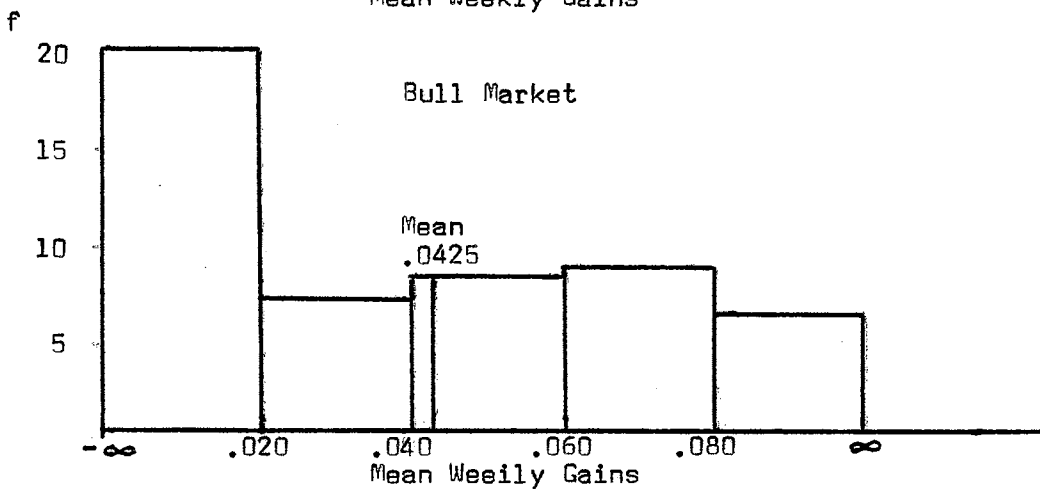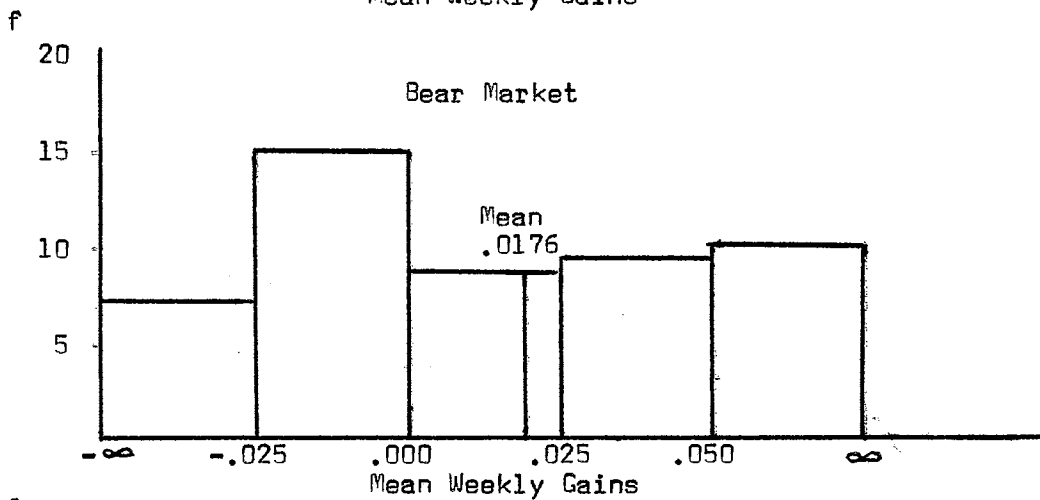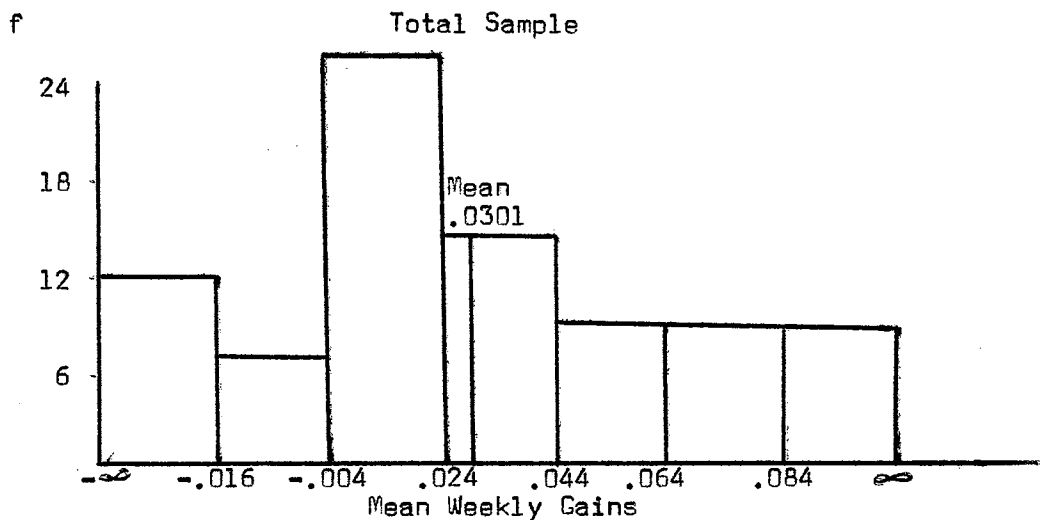
twelvth week after purchase. This is not presented as an optimal policy, although it per chance might be. Helpful to forming an optimal or near optimal policy that yielded maximum capital gains would be an examination of price changes within the twelve week sample period. This examination is the aim of the following section, "volitility analysis."

Volitility Analysis

This section is concerned with the weekly timing and variability of new issue price movements within the twelve week sample period. The methodology employed is similar to the comparable section in Part I of the study. Again, in order to perform this analysis a mean and a standard deviation is computed for each of the twelve weeks sampled. The first week includes the percentage price changes of all one hundred members between the offering price and the closing bid price on the first Wednesday after offer. The second week includes the percentage price changes from the first Wednesday after offer to the closing bid price one week later, and the ten subsequent week means and standard deviations were computed in similar fashion.

Variability Between Weeks:

The testable hypothesis, it will be recalled, is H_7 = that the maximum volitility will occur in week one of the sample period. The basis for this hypothesis was discussed in Chapter IV when testing a similar hypothesis for the two stratified samples. The hypothesis is tested in two ways: first, by comparing the mean gain or loss of the individual weeks, and second, by comparing the relative dispersion about these weekly means.

Together these measurements are said to represent volitility for the pur-
pose of testing the hypothesis.

The twelve individual mean gains or losses are illustrated graph-
ically in Figure VIII. This illustration dramatically demonstrates why
H_7 must be accepted as far as this component of volitility is concerned.
Similarly, H_3 was accepted for the two stratified market samples. In the
total sample case, the mean price advance for the first week (offer price
to first Wednesday close) is 25%. Percentage price changes for subse-
quent weeks vary from -1.46% to +3.2%--a range of only 4.66%. It may be
concluded, then, that new issue prices generally register a considerable
initial week gain regardless of general market conditions and relative to
immediately subsequent weeks. These results do support previously cited
studies that made similar initial week gain claims based upon unstratified
samples. In way of explanation for this oft discovered phenomenon, it is
enlightening to refer back to the last section of Chapter I. There the
reasons for an apparent tendency to underprice new issues are stated. Also
it is postulated at that point that this underpricing bias is alleviated
rapidly (the first week) in the marketplace. Other contributors to a
first week price surge are the heavy "promotion" assigned to new issues
shortly after issue and the other "questionable practices" employed by
underwriters to spur a rapid acceptance of newly issued securities. These
"questionable practices" were developed and listed when reviewing the find-
ings of the S.E.C. Special Study of the Securities Markets in Chapter II.

Variability Within   Weekly Data:

The second portion of the volitility analysis is a week by week com-
parison of the relative dispersion found for each of the twelve weeks.

FIGURE VIII

TOTAL SAMPLE--MEAN GAIN OR LOSS BY WEEK
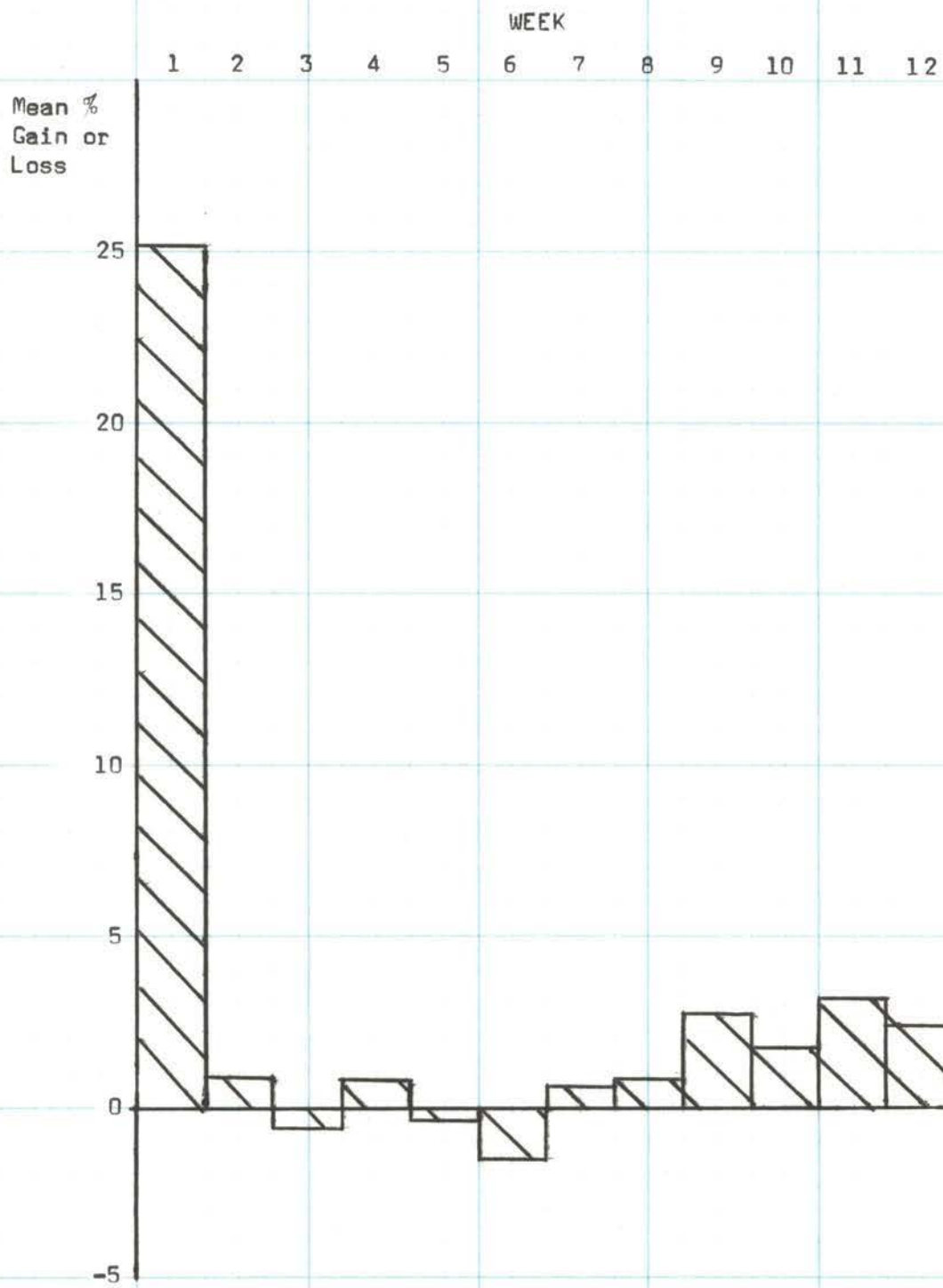
The computations are made according to the same procedure used in Part I, Chapter IV, for the stratified samples. Relative dispersion is again the coefficient of variation which in turn is the standard deviation for each week divided by the mean price change for that week. The coefficient of variation, of course, allows a relative comparison of standard deviations when the means are different. Figure IX illustrates the results for the twelve week sample period.

The results obtained from a comparison of in-week dispersion values for the twelve weeks are not as clearly indicative as are the results of the mean gain or loss component of volitility. As a matter of fact, the first week not only fails to register the highest relative dispersion but ranks seventh of twelve weeks. Week four contains the greatest relative dispersion by a considerable margin over the next highest week: 5.24 for week four to 1.54 for the next highest weekly figure. It seems that H_7 must be rejected for this portion of the volitility analysis. Therefore, the two chosen measures of volitility yield opposite results but to different degrees. The mean price change is extremely large for week one while the relative dispersion is only average, if that. A qualified acceptance of H_7 is made, however, based upon the extremely high mean price change and a standard deviation which is also considerably higher than for any other week. In computing the relative dispersion the extremely high mean offsets the large standard deviation in week one. Nevertheless, an acceptance of H_7 must be qualified by the absence of a high _relative_ dispersion in week one, since relatively the mean gain is more assured than the mean gain of six other weeks.

The results of week four deserve further mention. The extremely high relative dispersion for this week indicates that the dependability of

FIGURE IX

RELATIVE WEEKLY DISPERSION--TOTAL SAMPLE
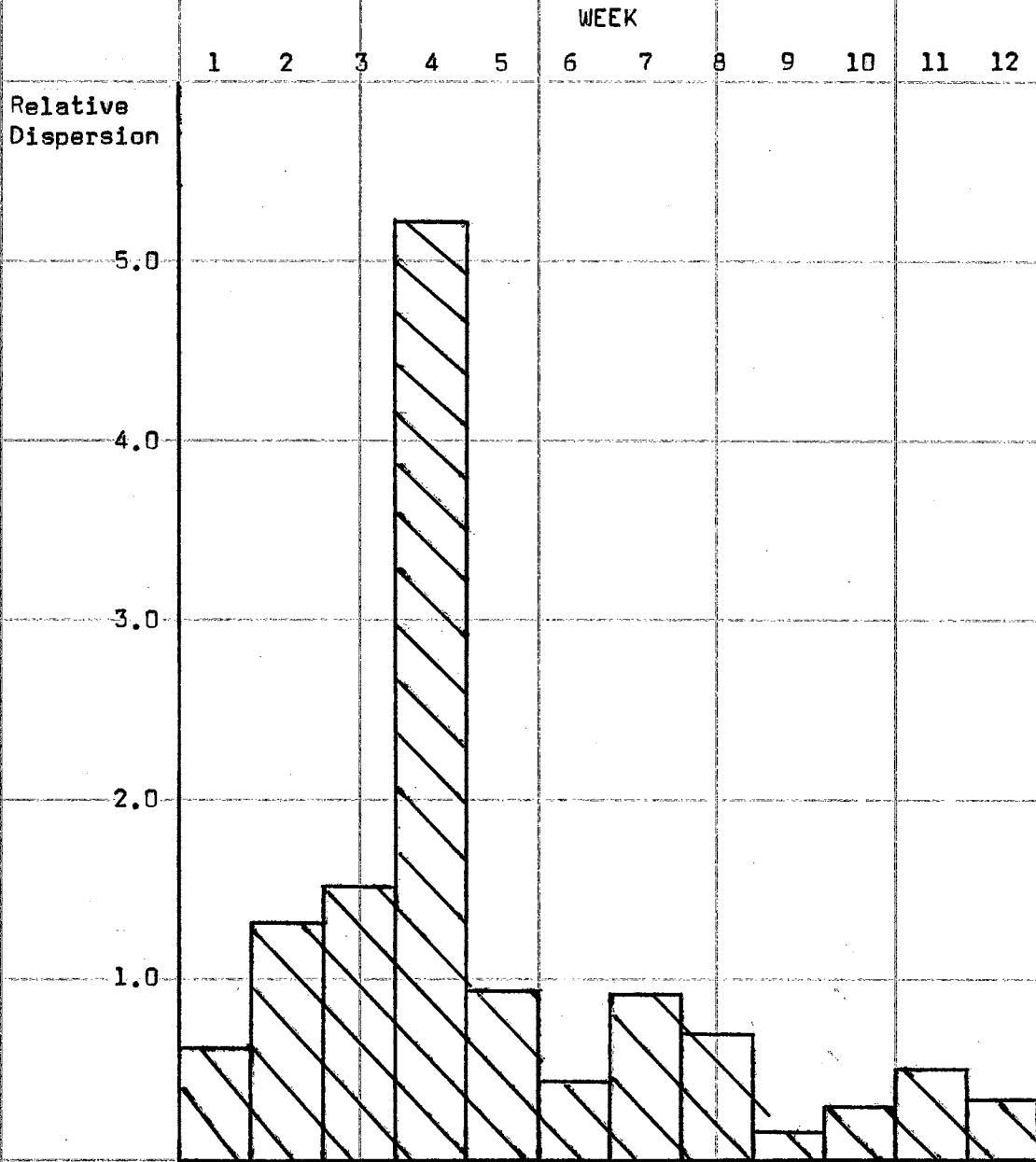
attaining that week's mean gain is small. This point is made in regard to the other short-run studies on new issue price performance; some of which are reviewed in Chapter II. It seems that all of these studies, whether using inclusive data or samples, arbitrarily selected to measure the price change from offer price to one month after issue. In so doing, all studies (to my knowledge) calculated mean percentage gains or losses without regard to the relative dispersion which appears to be high at this particular time (one month after issue). This is not to detract from the results of previous studies, but only to indicate that considerable volitility may be hidden within any specified mean. This study further indicates that in-week dispersion may be highest at the points (first week and fourth week) most frequently selected to measure short run price performance.

Tentative Conclusions:

The results for the total sample volitility analysis are similar to the results of the same analysis for the two individual stratified samples. Again, it may be said that the greatest volitility occurs in week one in terms of the mean price change of newly issued common stock. Also, relative dispersion is again a qualifying component of volitility as measured, and the acceptance of the hypothesis that volitility was greatest in the initial week after issue had to be qualified in this respect. Generally, week one again presents the greatest opportunity for price appreciation, as defined, with a very high mean gain and only an average relative dispersion.

CHAPTER VI

SUMMARY OF FINDINGS AND THEIR IMPLICATIONS

Summary of Findings

New corporate initial public stock offerings are becoming more im-
portant as a segment of the securities markets, both in terms of the num-
ber of new offerings made each year and the dollar value of these new
offerings. Because of their effect upon the securities markets, they
have received particular attention over the past decade in two distinct
areas. First, the Securities and Exchange Commission has been concerned
with their effect upon market stability, especially on the over-the-
counter markets. The S.E.C.'s 1959-1962 Special Study was heavily di-
rected toward measuring the effect of new "hot" issues upon the stability
of the market and in turn determining the effect of certain "questionable
practices" of underwriters and brokerage houses to promote enthusiastic
public acceptance of new issues. Second, from the investors viewpoint,
new issues as a group have stimulated several price performance studies
usually designed to emphasize spectacular short-run capital gains and/or
subsequent price declines of initial "high-flyers."

The study presented in this paper is in the second category--a price
performance study. Its two parts represent reinforcement of the old and
exploration of the new. Part I is original research in that no prior
study has attempted a sample comparison of new issue performance based

upon samples stratified by market conditions. Part II involves the total sample and was thusly unstratified, so its results are more comparable to the results of former studies.

Before proceeding to the implications of the findings of this study, a table of hypotheses testing with a brief summary of results is presented to refresh the memory and to use as reference in the concluding section.

TABLE 6

SUMMARY OF HYPOTHESIS TESTING FOR PART I--STRATIFIED SAMPLES

	H_1	H_2	H_3
Statement of Hypothesis	That there is no significant difference between the distribution of the bull and bear market sample means and a normal distribution.	That the mean weekly % price changes will differ significantly between the bull and the bear market samples.	That the greatest one week mean price changes will occur in the first week after issue for both the bull and bear market samples.
Test Methodology	Chi-square $$x^2 = \sum \left[\frac{(O-E)^2}{E} \right]$$	T-test	% price change compared for each of 12 weeks.
Acceptance Criterion	Significant for acceptance at the .01 level	Probability of difference due to randomness of .05 or less	The mean price change in week 1 exceeds any other single week of the sample period
Results	$x^2 =$ bear market = .03 bull market = .15	Probability of difference due to randomness is less than .01 for the two tailed test	The mean price change in week 1 is over 4 times the next highest week for both samples
Accepted or Rejected	Accepted	Accepted	Accepted

57

TABLE 7

SUMMARY OF HYPOTHESIS TESTING FOR PART II--TOTAL NEW ISSUE SAMPLE

	H_4	H_5	H_6	H_7
Statement of Hypothesis	That there is no significant difference between the distribution of the means of the total sample and a normal distribution.	That the distribution of the total sample means will more closely represent a normal distribution than either of the two stratified samples.	The mean price change will be positive for the total sample.	That the maximum volitility will occur in week one.
Test Methodology	Chi-square $$x^2 = \sum \left[\frac{(o-e)^2}{e} \right]$$	Chi-square results compared.	Mean weekly % price change is computed for 100 member total sample.	Comparison of: 1. price changes in individual weeks and 2. relative dispersion in individual weeks.
Acceptance Criterion	Significant at the .01 level.	Total sample has lower probability of difference due to randomness than either of the two stratified samples.	A positive result.	Mean price change and relative dispersion in week one exceeds the same figures in any other single week.
Results	$x^2 = .19$	bear market = .03 bull market = .15 Total sample = .19	$\overline{X} = .0301$ per week.	1. High initial week mean price change. 2. Average initial week dispersion
Accepted or Rejected	Accepted	Accepted	Accepted	Qualified acceptance

Implications

The implications that can be drawn from the findings of this study
are numerous. In keeping with the organization of this paper these im-
plications will be discussed, first in terms of known market conditions,
and second in more general terms. Lastly, logical extensions and recom-
mendations for further study will be offered.

The principle conclusions and implications resulting from the an-
alysis of the bear market sample are as follows.

1. The bear market sample data least fits a normal distribution of
the three samples tested (see H_5 results). Although unexpectedly the
mean of the weekly price changes is positive (1.76% per week), this is
somewhat misleading. The mode of the distribution is in a negative in-
terval (Figure VII) and the week by week volitility analysis reveals
that only the first week of the first eight weeks after issue had a pos-
itive mean.

2. As a measure of volitility, relative dispersion is low in the
first six weeks after issue with the exception of week three. Further,
only three weeks out of twelve have a lower relative dispersion than week
one. The conclusion drawn from the initial week's high mean gain and low
relative dispersion was that this represented the most advantageous single
buy and sell period for gross capital gains. It is now advanced that the
probable cause of this seemingly unlikely situation is a combination of
forces. On the supply side, the downward bias has been described regard-
ing offer prices of new issues. Additionally, during a bear market,
underwriters are probably even more prone to underprice a new issue due
to pessimism caused by general market conditions. The fact that this

pessimism exists may be documented by the lower rate at which new issues

are brought to market during a period of falling prices. The result is,

then, a greater general tendency to underprice new issues in a bear mar-

ket. From the demand side, pressures are also in existence to cause a

rapid initial increase in new issue prices. As was just indicated, the

supply is lower during a bear market, since new issues are brought out

at a slower rate. With the general market performing poorly investors

seek new sources of investment, particularly those interested in short-

run price appreciation and the short supply is much in demand.

3. Since weeks two through eight register mean losses, it is further

implied that the best policy is to purchase at or near the offer price

and to sell within a week after the offering date. In this regard an

even more precise price performance study using daily price changes is

recommended for the first week after issue. Indeed, some studies[1] have

indicated that a significant number of new issues reach premiums on the

first _day_ after issue.

The principle conclusions and implications resulting from the analysis

of the bull market sample are similar to the above in several respects.

1. According to the chi-square statistic the bull market sample

distribution more closely represents a normal distribution than the bear

market sample. In analyzing the distribution (Figure VII), comments

similar to those made about the bear market distribution may be made,

however. First, although the mean price change is decidedly positive

(4.25% per week) the mode is two intervals lower. For 40% of the sample

the one week gain is lower than 2% per week so again the mean weekly

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[1] S.E.C. Study and Merrill, Lynch Study, op. cit.

price gain is somewhat misleading. It is also noted that in terms of the number of weeks in which gains occurred, the bull market sample of new issues failed to outperform the general market index data from the same periods. Table 4 shows that the general market (as measured by the three chosen indexes) gained in 79% of the weeks while the new issue sample gained in only 53% of the weeks.

2. As in the bear market sample the initial week recorded the greatest mean gain (21%) of the sample period. Unspectacular results were recorded for the succeeding eleven weeks, but nevertheless all had gains except week six. Unlike the bear market sample, however, the greatest relative dispersion for the bull market sample occurs in the first six weeks of the sample period. Based upon these two facts a buy and hold for the twelve week duration (at least) is the recommended policy for those who have accepted the prior premise that a bull market situation exists and will continue for the short-run. It may be disturbing to some that only short-run "trading" policies are recommended. These recommendations are not to preclude the longer term buy and hold strategy but only to report the implications of the results of this particular study which is short-run in nature.

Conclusions of a more general nature are derived from the results of the total sample analysis, particularly in comparison to its stratified sample components. The principle observation regarding a general sample is that while its analysis is of benefit, when drawing conclusions one has to be wary of many misleading averages which may result. Nevertheless, as has been mentioned the total sample results may be preferred as a guide when the general market conditions are either unknown or inconclusive. In general, then, it may be said that new issues tend to

register their greatest gain in the initial week after offer (25% average

for the total sample). Subsequent weeks, however, mainly reflect moderate

gains. Weeks three, five, and six are the only weeks to show an average

decrease in price. Further, the greatest volitility occurs in the initial

five weeks in terms of relative dispersion around the weekly mean values.

Dispersion builds up to a peak in week four and then generally decreases

through week twelve. In general it may be said that the optimum policy

for the accrual of capital gains includes the purchase at offer price.

Thereafter the optimal course of action is unclear since immediately

subsequent weeks have low gains, if any, and high dispersion, yet the

last six weeks of the sample period indicate gains of one to three per-

cent per week with low dispersion. Therefore, individual investment ob-

jectives must be applied to determine the selling point.

New Issue Investment In Perspective

Although this study has been essentially a capital appreciation

price performance study, certain features of risk analysis were involved.

Specifically, the measurement of relative dispersion within the weeks and

the measurement of price variability between the weeks may well be con-

sidered a valid partial examination of risk factors. However, the measure-

ment of risk involved in the short-run investment of new issues was at most

a side benefit of the study and no attempt was made to do a thorough an-

alysis in terms of risk. Such an analysis is recommended though, since

risk represents the most outstanding single gap in the knowledge available

to investors in new issues.

It is hoped that this study made some small contribution to the state

of knowledge on new issue price performance. It is further hoped that an

analysis of risk factors will be undertaken in the near future. From this point a meaningful comparison of relative performance and risk may be made between new issue investment and alternative investment opportunities.

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APPENDIX

LIST OF COMPANIES COMPRISING SAMPLES

Bear Market Sample

Companies 1-25 (except 8, 13, 16), Period 1, July 13 - October 5, 1966
Companies 51-75 (plus 8, 13, 16), Period 3, January 3 - March 28, 1968

Bull Market Sample

Companies 26-50, Period 2, January 18 - April 12, 1967
Companies 76-100, Period 4, September 17 - December 9, 1968

Total Sample

Companies 1-100, all periods

Company code number	Name of company	Period number	Weekly mean of the 12 week % price change
1	Alpine Geophysical Associates, Inc.	1	- 0.2
2	Applied Technology Inc.	1	3.7
3	Buckbee-Mears Co.	1	3.3
4	Aerovox Corp.	1	0.8
5	Cole Drug Co., Inc.	1	- 2.9
6	Colonial Life and Casualty Co.	1	- 1.9
7	Computax Services, Inc.	1	- 1.8
8	Newark Electronics Corp.	3	0.2
9	Digital Equipment Corp.	1	1.7
10	Duro Pen Co., Inc.	1	- 3.4
11	General Nuclear Inc.	1	2.1
12	Graphic Controls Corp.	1	- 3.0
13	P & F Industries, Inc.	3	- 2.7
14	Medicenters of America	1	4.1
15	Ohio Ferro Alloys Corp.	1	- 1.6
16	Wometco Enterprises, Inc.	3	- 0.6
17	Rover Shoe Co.	1	- 0.3
18	Space Ordinance Systems, Inc.	1	- 0.1
19	Space Systems Laboratory, Inc.	1	2.6

Company code number	Name of company	Period number	Weekly mean of the 12 week % price change
20	Sperti Drug Corp.	1	- 2.6
21	Acushnet	1	- 3.5
22	Superior Computer Corp.	1	- 1.6
23	University Computing Co.	1	3.5
24	Vermont American Corp.	1	- 3.3
25	Wean Industries, Inc.	1	- 2.3
26	Aero Systems, Inc.	2	11.3
27	Eastern Airlines	2	1.3
28	Allen Aircraft Radio, Inc.	2	3.7
29	Ames Department Store, Inc.	2	4.3
30	Big Three Industrial Gas & Equipment Co.	2	0.9
31	Champion Products, Inc.	2	1.6
32	Becton, Dickinson & Co.	2	1.2
33	Duplex Products, Inc.	2	4.3
34	Dynell Electronics, Inc.	2	7.1
35	Eberline Instrument Corp.	2	14.4
36	Farah Manufacturing Co., Inc.	2	7.2
37	Giddings & Lewis Machine Tool Co.	2	5.3
38	Grainger (W.W.), Inc.	2	0.0
39	Gulf Aerospace Corp.	2	3.6
40	Key Pharmaceuticals, Inc.	2	1.7
41	Lums, Inc.	2	7.1
42	Met-Pro Water Treatment Corp.	2	4.2
43	Handy & Harman	2	2.1
44	P & C Food Markets, Inc.	2	- 0.2
45	Southern Co.	2	0.3
46	Sanders & Thomas, Inc.	2	4.0
47	Seven-Up Co.	2	1.4
48	Superior Electric Co.	2	6.1
49	Varo, Inc.	2	4.8
50	Burndy Corp.	2	- 1.2
51	Alpha Industries, Inc.	3	- 1.4
52	American Snacks, Inc.	3	2.8
53	Astrosystems, Inc.	3	12.7
54	Bandag, Inc.	3	6.6
55	Benjamin (W.A.) Inc.	3	- 2.5
56	Associated Baby Services, Inc.	3	- 0.8
57	Childhood Productions	3	1.1
58	Chronetics, Inc.	3	5.8
59	International Industries, Inc.	3	0.1
60	Efficient Leasing Corp.	3	4.6
61	Extendicare, Inc.	3	11.5
62	Flight Safety, Inc.	3	1.9
63	Gamma Process Co.	3	16.7
64	Guenther Systems, Inc.	3	7.2
65	Helio Aircraft Corp.	3	- 1.5

Company code number	Name of company	Period number	Weekly mean of the 12 week % price change
66	Radiation Machinery Corp.	3	9.2
67	Radiation Systems, Inc.	3	- 1.9
68	Reading & Bates Offshore Drilling Co.	3	1.1
69	Republic Systems & Programming, Inc.	3	6.9
70	Sea World, Inc.	3	3.2
71	Software Systems, Inc.	3	6.4
72	Telephone Utilities, Inc.	3	- 1.8
73	Thermo National Industries, Inc.	3	4.5
74	Tiffany & Co.	3	- 0.3
75	United Convalescent Hospitals	3	6.0
76	American Bioculture, Inc.	4	12.6
77	Cinema V Distributing, Inc.	4	3.4
78	Coleman (Alex), Inc.	4	1.3
79	Commodore Corp.	4	6.6
80	Dearborne Computer Corp.	4	1.5
81	Dero Research & Development	4	1.9
82	Dixie Chemteck, Inc.	4	12.4
83	Dudley Sports Co., Inc.	4	6.9
84	Edwards Industries, Inc.	4	1.2
85	Electro Powerpacs Corp.	4	0.2
86	MEM Co., Inc.	4	2.1
87	Frequency Electronics, Inc.	4	4.5
88	Gulf Life Holding Co.	4	1.1
89	Kappa Frocks, Inc.	4	6.2
90	Leigh Products, Inc.	4	6.9
91	Sterling Electronics	4	- 1.3
92	Ray Proof Corp.	4	6.0
93	STP Corp.	4	4.2
94	American Automatic Vending	4	1.8
95	Transvac Electronics, Inc.	4	8.6
96	Trend Industries, Inc.	4	3.3
97	Vacu Blast Corp.	4	1.2
98	Vega Precision Labs	4	1.9
99	Vetco Offshore Industries, Inc.	4	3.6
100	Weight Watchers	4	17.7

VITA

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Master of Business Administration

Thesis: A SHORT-RUN ANALYSIS OF NEW ISSUE PRICE PERFORMANCE

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Title of Study: A SHORT-RUN ANALYSIS OF NEW ISSUE PRICE PERFORMANCE

Pages in Study: 69   Candidate for Degree of Master
                                        of Business Administration

Major Field: Business Administration

Scope and Method of Study: The past decade has witnessed a phenominal
    increase in investment interest in new common stock issues of
    corporations "going public." The object of this report is to
    examine the short-run capital appreciation performance of these
    newly issued securities. Price performance is measured in terms
    of the magnitude and volitility of weekly percentage price changes.
    The analysis is accomplished for a 100 member sample and two com-
    ponent 50 member samples, the latter of which are homogeneous with
    regard to their origin in rising or falling markets. A twelve
    week price history is used for the short-run study.

    An analysis of the results obtained from testing seven formal
    hypotheses reveals much about the distribution, direction, mag-
    nitude and volitility of the observed new issue weekly price
    changes. The theory underlying the probable causes of the re-
    sults obtained is well elaborated.

Findings and Conclusions: From resulting Chi-square statistics, all
    three samples were assumed to be representative of a normally
    distributed population. The mean of the weekly percentage price
    changes was positive for all samples: bear market sample, 1.76%
    per week; bull market sample, 4.25% per week; total sample, 3.01%
    per week. However, as expected, the T-statistic proved the means
    of the bear and bull market samples to be significantly different
    in regard to their respective distributions. The initial week
    after issue showed the greatest gains (over 20% in each case) and
    generally low relative dispersion. The most favorable performance
    occurred in the initial week after issue for the bear market sample,
    and a theoretical basis for this somewhat surprising result is well
    documented.

ADVISER'S APPROVAL _George E. Peniche_