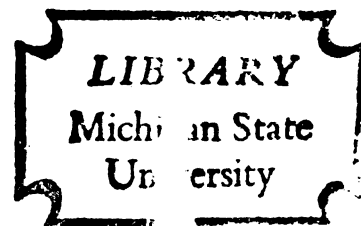


AN ANALYSIS OF THE PRICE BEHAVIOR OF
INITIAL COMMON STOCK OFFERINGS

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
JAMES DEAN BLUM
1971



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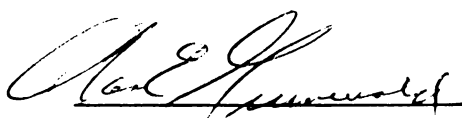
AN ANALYSIS OF THE PRICE BEHAVIOR OF
INITIAL COMMON STOCK OFFERINGS

presented by

James Dean Blum

has been accepted towards fulfillment
of the requirements for

Ph.D degree in Finance



Major professor

Date

February 10, 1971

ABSTRACT

AN ANALYSIS OF THE PRICE BEHAVIOR OF INITIAL COMMON STOCK OFFERINGS

By

James Dean Blum

Purpose of Study

Two objectives motivated the study of initial common stock offerings and their market price behavior. These two objectives were: first, to determine how initial common stock offerings have performed in the past, and second, to determine if capital market institutions have been able or willing to bring initial offerings to the market in equilibrium with the over-the-counter market. In order to evaluate these two questions accurately the fact that initial offerings are not exactly homogeneous needed to be taken into account. The three basic types of initial offering distributions are: primary, secondary and mixture. Thus, initial offerings were stratified according to who received the proceeds from the sale of the offering, the company and/or selling stockholders. Another aspect of this study has been to determine if variations in market rates of return on the various types of initial offering distributions could be explained by

differentials in risk.

Methodology

The total period covered by the study extended from January 19, 1965 (when the first initial offering was selected) to June 30, 1970 (a year after the last initial offering was selected). A random sample of 400 initial common stock offerings was drawn. The market returns and risks associated with these 400 issues were calculated for sixteen time periods, ranging from one week to one year after the offering date.

A performance relative index was developed to determine whether initial offerings' market price movements paralleled the performance of the Over-the-Counter Industrial Average.

The 400 initial offerings were stratified into four subsamples according to who received the proceeds from the sale of the offering. Initial mixture offerings were subdivided into mainly primary and mainly secondary, based on who received the majority of the proceeds, the company or selling stockholders. The other two types of distributions were initial primary and secondary offerings. The market returns and risks of these four stratified groups

James Dean Blum

were compared to ascertain if variations in return existed and the extent to which such variations in return could be explained by differentials in risk.

Findings

The major findings of this study were:

(1) Initial common stock offerings have shown higher than normal market rates of return. The mean market rates of return on initial offerings ranged from a low of 32.43 per cent within the first week after the offering date to a high of 64.33 per cent nine months after the offering date.

(2) Initial common stock offerings' market price performance has been in disequilibrium with the performance of the Over-the-Counter Average. The market rate of return on initial offerings, even after a risk adjustment for the shifting of capital from seasoned to unseasoned securities, showed superior performance in relation to the OTC Average in both the short and long run.

(3) Initial primary common stock offerings have proved to be a better investment than initial mainly primary, mainly secondary, and secondary offerings. They have both a higher market rate of return and have had less

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James Dean Blum

risk -- as measured by relative variability and probability of decline -- than the other three types of distributions. In other words, the variations in return between types of initial offering distributions could not be explained by differentials in risk. This finding strongly indicates that investment bankers have either underpriced and/or pushed in the after-market those initial offerings in which they held greatest financial interest. Underwriters held warrants in 78.1 per cent of the initial primary offerings floated in 1968, whereas they held warrants in only 45.0 per cent of the initial mainly primary offerings, 30.8 per cent of the initial mainly secondary offerings, and 16.7 per cent of the secondary offerings floated in 1968.

The mean market rates of return on the sample of initial offerings and the various types of initial offering distributions were as follows:

Time	Mean Percentage Rates of Return				
	All Offerings	Primary	Mainly Primary	Mainly Secondary	Secondary
One Week	32.4	46.1	25.7	18.6	15.5
Six Weeks	40.8	58.3	32.4	21.9	20.4
Three Months	54.7	78.6	46.3	24.0	26.2
One Year	59.5	77.2	68.6	15.1	36.2

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Contributions of the Study

This research effort should help to fill a gap in the investment literature on initial common stock offerings. Little research has been done on this group of offerings to date.

Secondly, it provides a guide to risk and return possibilities encountered in initial offering investing. This examination may aid investors interested in the initial offerings' market determine optimal strategies of buying and selling such offerings. It could also serve to demonstrate to the securities authorities that many inequities have existed in the initial offerings' market.

AN ANALYSIS OF THE PRICE BEHAVIOR OF
INITIAL COMMON STOCK OFFERINGS

By

James Dean Blum

A THESIS

Submitted to
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in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Accounting and Financial Administration

1971

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1971

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Throughout my period of study at Michigan State University I received invaluable academic and personal support from a host of faculty members. Any list of acknowledgments excludes many of those who contributed their efforts in my quest for the degree, but their assistance was vital and I appreciated it very much.

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I would, also, like to thank Professor Eli P. Cox for his impartial comments and criticisms which contributed greatly to the study.

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Finally, to my wife, Mary, whose patience, understanding, and love made it possible for me to successfully complete my dissertation.

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CHAPTER I

INTRODUCTION

Purpose of Study

The purpose of this study is two-fold. The first objective is to determine how initial common stock offerings have performed. The second objective is to determine if capital market institutions have been able or willing to bring initial offerings to the market at their equilibrium offering price. In order to answer or examine each of these questions the fact that initial offerings are not exactly homogeneous needs to be taken into account. It seems very important to stratify initial offerings according to who receives the proceeds from the sale of the offering, the company and/or selling stockholders. This point has been apparently overlooked by most investors and all researchers to date.

Characteristics of the New Common Stock Offerings Market

During recent years the growth of new common stock offerings has accelerated. In 1962 the dollar value of all new common stock offerings totaled \$1,314 million.

By 1969 the dollar volume of new offerings had grown to over \$7,714 million.¹

A very important segment of new offerings has been initial common stock offerings from companies going public for the first time. Approximately 40 per cent of the new offerings in the past have been initial common stock offerings.

Despite the fast rate of growth in initial common stock offerings, relatively little research has been done on their market price behavior. In fact, only one research study has dealt exclusively with initial common stock offerings, and it was for a relatively short time period.² Of even more concern is the fact that the research studies completed on new offerings have generally covered relatively short time periods during bullish markets.

During bullish market periods an enormous number of initial offerings are floated and generally are sold out prior to their effective date. Venture capital seems unlimited during a good market and almost nonexistent

¹New common stock offering dollar figures were obtained from the Federal Reserve Bulletin. See Appendix A, Table A-1, for recent yearly dollar totals.

²The only short study dealing exclusively with initial offerings is: Frank K. Reilly and Kenneth Hatfield, "Investor Experience With New Stock Issues," Financial Analysts Journal, Sept.-Oct., 1969, pp. 73-80.

during a poor market. During poor market periods new offerings are almost impossible to sell to investors.

Apparently, most investors have little or now knowledge of exactly what they are purchasing. It seems during a bullish market little consideration is given by the investor to the financial facts of the firm, such as, the firm's assets, earnings potential, use of the proceeds, who receives the proceeds from the sale of the offering, etc. The influencing factor is more apt to be whether or not the investor is able to obtain new offerings allocated by stock brokers to preferred customers. A study by David Clurman,¹ Assistant Attorney General of the State of New York, analyzing 103 new offerings floated in 1968-69 and 122 persons who bought new offerings during this period, concluded that in most cases the prospectus was not even used by the investor. In fact, the only knowledge the investor had was that he was purchasing a new offering.

Review of Initial Offering Terminology

Much of the confusion in the new offering area lies in its terminology. A basic understanding of the terminology may be of extreme importance to the investor.

¹David Clurman, A Report to the Honorable Louis J. Lefkowitz, Attorney General of the State of New York, Pursuant of Section 352 of the General Business Law on New Issues of Securities, September, 1969.

Below are several terms with which the reader will need to be familiar.

New Common Stock Offering (New Offering): A new common stock offering is the sale of any common stock not presently being traded in the market. It may be new stock issued by the firm or insiders (selling stockholders)¹ selling a significant block of their holdings in the firm. This includes both initial offerings and seasoned common stock offerings. This category is the all inclusive one and includes all of the types defined below. Most research studies so far have dealt with this general classification of common stock issues.

Initial Common Stock Offering (Initial Offering): An initial common stock offering is any equity financing by a firm or liquidation by selling stockholders of common stock that has never had a previous public market. The offering price is determined through negotiations between the company and/or selling stockholders and the underwriter.

Seasoned Common Stock Offering: A seasoned common stock offering is common stock issued by a firm or selling stockholders whose previously outstanding shares were

¹Selling stockholders refers, in this study, to original owners, developers, etc. who have outstanding shares purchased or given to them for services rendered from the firm. These shares have never been traded in any market previously.

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publicly traded, for example, AT & T selling authorized but not outstanding shares to the public to raise new capital.

Unseasoned Common Stock Offering: An unseasoned common stock offering is another name for an initial common stock offering.

Primary Stock Offering: A primary stock offering is a stock offering in which the proceeds from the sale of the offering go to the issuing company.

Secondary Stock Offering: A secondary stock offering is a stock offering in which the proceeds from the sale of the offering go to the selling stockholders.

Mixture Stock Offering: A mixture stock offering is a stock offering in which the proceeds from the sale of the offering go to both the company and selling stockholders. In other words, part of the shares sold are issued by the company and part of the shares sold are from selling stockholders.

Mainly Primary Stock Offering: A mainly primary stock offering is a mixture stock offering in which 50 to 99 per cent of the proceeds go to the company.

Mainly Secondary Stock Offering: A mainly secondary stock offering is a mixture stock offering in which one to 49 per cent of the proceeds go to the company.

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Red Herring (Preliminary Prospectus): A red herring is a report which gives a description of a forthcoming security issue, but contains no underwriting data and does not constitute an offer to sell the security. It is sent out before the effective date.

Prospectus: A prospectus is a report used as a selling document. It is the same as a red herring, but it also includes underwriting data and is an offer to sell the security. Any offer to sell a new offering must be accompanied by a prospectus.

Effective Date: The effective date is the date on which one may legally begin selling a new security offering. This date is set by the Securities and Exchange Commission (SEC).

Underwriter: An underwriter is anyone who purchases a block of securities from a firm or selling stockholders for the purpose of reselling the securities immediately to investors. The underwriter receives for his services the margin or spread between the price he pays for the security and the price at which the security is resold to the public. There are no brokerage commissions to the investor on the purchase of new offerings. Other contingent forms of compensation are often used in addition to the spread.

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Underwriting Syndicate: An underwriting syndicate exists when two or more underwriters pool their resources to purchase a new offering.

Selling Group: A selling group is a syndicate of underwriters and brokers organized for the purpose of selling a security offering. It is formed to speed distribution and thus increase the turnover of the underwriter's invested capital, to obtain a wider market for the offering, to spread the risk of completely selling the offering, and finally, to assure underwriters of receiving a variety of offerings to sell throughout the year.

Risk Premium Rate of Return for an Unseasoned Security: The risk premium rate of return for an unseasoned security is the rate of return demanded by investors on initial offerings to compensate them for investing in a security that has not had a previous public market. This risk premium rate of return is needed to induce investors to shift investment capital from seasoned securities to unseasoned securities.

ROLE OF CAPITAL MARKETS

Capital Markets and Investment Spending

The primary function of capital markets is to make possible the transfer of funds from household, business, and government units with surpluses, i.e., excess of saving over investment, to units with deficits, i.e., excess of investment over saving.¹

An economy grows by committing present economic goods to create additional capacity to produce and to improve technology. Decisions to invest today determine tomorrow's products and costs, which influence every facet of the economy. In a capitalistic economy, decisions to invest real capital goods are made largely by private individuals and business managers. Governments at all levels may attempt to encourage capital formation by means of tax incentives, subsidies, and low interest loans, but the initiative primarily lies with the entrepreneur.

Through capital markets, entrepreneurs have potential sources of funds to finance their projects. Also, through capital markets the opportunity cost of funds, to users and investors alike, is established. This is accomplished by providing investment alternatives to use as a

¹James L. Duesenbury, "Criteria for Judging the Performance of Capital Markets," Elements of Investments, ed. H. K. Wu and A. J. Zakon (New York: Holt, Rinehart and Winston, Inc., 1965), p. 1.

basis of comparison for an investment under consideration.

Entrepreneurs, through investment bankers, contract with investors and receive current funds in exchange for rights to future funds. The rate which equates expected future funds flows with the certain outlay on the part of the investor is known as the interest rate (or expected rate of return on investment). At some expected rate, an investor is indifferent between holding cash and transferring control of his funds in exchange for expected future funds. When any doubt exists concerning either the size or timing of future receipts, an investor must determine his scale of preferences between holding the right to a stream of uncertain returns and a stream of certain returns.

The rate for a particular company (entrepreneur) is not established in isolation; but rather it is determined relative to the opportunity cost of investing in similar risk situations. Thus, the rate of return demanded by investors on new undertakings, for example, initial offerings, is closely tied to the market rates of return on existing opportunities, for example, seasoned securities.

Efficiency of Capital Markets

Theoretically, capital market institutions attempt

to bring together investors and users of capital in the most efficient manner possible. The performance of the different portions of the capital markets may be analyzed by two sets of criteria. These are commonly referred to as operational efficiency and allocational efficiency. Capital market institutions are meeting accepted standards of operational efficiency if they perform their functions at a minimum cost. This study will not attempt to analyze operational efficiency.

The main concern of this study is whether capital markets have met accepted standards of allocational efficiency.

Allocational efficiency, which may be regarded as the most important economic service provided by the new issues markets, relates to the ability of these markets to maintain equivalent rates of return or costs of financing on comparable investments.¹

For the initial offerings market, this would imply that for society's best interest to be served, capital needs to be allocated to its best uses first. We assume that best uses are expected to yield the highest return per risk taken.

The efficiency of this allocation process can be assessed, at least in retrospect, by the

¹Irwin Friend et al, Investment Banking and the New Issues Market (Cleveland: The World Publishing Company, 1967), p. 7.

extent to which there are variations in return between different types of new issues and especially between new and comparable outstanding securities, and by the extent to which these variations can be explained by differentials in risk. Underwriting compensation may be regarded as a cost paid to attain allocational efficiency.¹

Therefore, initial offerings, or other investment opportunities available to investors supplying capital, should be available at prices consistent with existing investment opportunities with respect to risk and return. This means that capital market institutions should attempt to price initial offerings such that their market price behavior parallels equivalent investment opportunities.

John R. S. Shad, senior vice president, E. F. Hutton & Co., Inc., in a speech sponsored by Corporate Seminars on October 3, 1968, made the following statements about initial offerings:

A new issue must compete with existing investment opportunities in a free auction market. In order to assure a successful offering and a favorable after-issue market, initial offerings are priced at a modest discount from the current market prices of the most comparable securities which already enjoyed seasoned public markets. . . .

This is not to say a new issue must go up, for security markets are of course subject to fluctuations, but if the financing was soundly conceived

¹Ibid.

and executed, the stock will not go down more than comparable investment opportunities.¹

Mr. Shad makes two important points about the pricing of initial offerings:

(1) Initial offerings should be priced at a modest discount from comparable securities, and

(2) Initial offerings should not go down more than comparable securities in the event of a general market decline.

Mr. Shad seems to be making the point that initial offerings' market performance should parallel the general market. For testing purposes, the securities of the over-the-counter market are used as the investors' most comparable outstanding investment opportunities. The over-the-counter securities are used because these securities are traded in the same manner as initial offerings, which are really a part of the over-the-counter market. Also, such attributes as asset size, age, market publicity and information, etc. of firms obtaining capital by an initial offering would be more comparable to those firms whose shares are traded on the over-the-counter market than firms listed on any of the exchanges. If initial offerings are in equilibrium with

¹John R. S. Shad, "Critical Considerations for Companies 'Going Public'," Commercial and Financial Chronicle, Vol. 208, No. 6828, October 10, 1968, p. 23.

the rest of the over-the-counter market, the only justification for greater returns on initial offerings to investors would be that initial offerings have more risk associated with them than seasoned over-the-counter securities.

The results in this study indicate that initial offerings have had, during the period studied, less risk associated with them than the Over-the-Counter (OTC) Average. However, a risk premium rate of return adjustment is made when comparing initial offerings with the OTC Average. This risk premium adjustment is not made because initial offerings have had more risk associated with them than the OTC Average, but rather may be needed to induce investors into shifting capital from seasoned to unseasoned securities. Otherwise, there would be no inducement for investors to exert the additional time and effort needed in examining and analyzing initial offerings.¹

Thus, if initial offerings have had:

- (1) The same/or less investor risk associated with them than the OTC Average, and
- (2) The investor is compensated for shifting

¹The reasons additional time and effort would be needed in analyzing initial offerings, is because of the lack of availability of facts about the firm through the normal investment sources. Also, past price patterns (movements) are not available to the investor.

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capital from seasoned to unseasoned securities, then allocational efficiency exists if and only if the average market rate of return on initial offerings is equal to the market rate of return on the OTC Average.

Finally, allocational efficiency is accomplished between the various types of initial offerings only if variations in return can be explained by differentials in risk. Thus, any variations in return between the different type of initial offering distributions (primary, secondary, and mixture) should be explainable by differentials in risk.

The Role of the Investment Banker

Investment bankers presumably can contribute most to this allocational function of the capital markets by careful security analysis leading to appropriate pricing, and by seeing that the issue is well publicized, that all possible relevant information is developed and disclosed, and that the issue is placed as much as possible in the hands of the ultimate investors.¹

In order to do this, initial offerings must be brought to the market at their equilibrium offering price.²

¹Friend et al, op. cit., p. 8.

²Equilibrium offering price is assumed to be the offering price at which the after-market price performance of initial offerings parallels the market price performance of the over-the-counter market.

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This requires the investment banker to determine not only a realistic value of a firm's assets and future earnings power, but also to anticipate the existing market conditions.

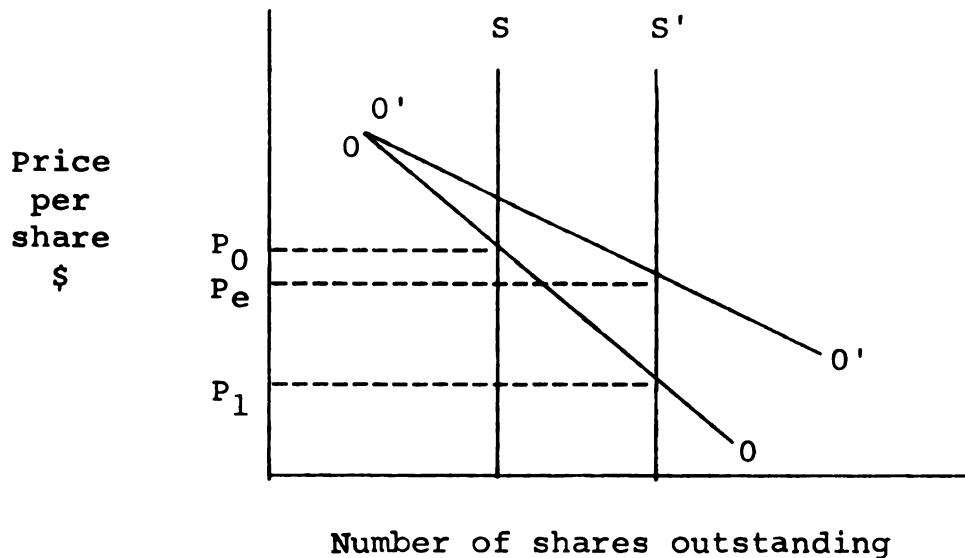
The main service an underwriter provides for a firm (selling stockholders) seeking additional equity (cash) from the investing public is to shift the security's demand curve upward by spreading publicity about the issuing firm. If this is done properly an increase in the supply of the firm's shares will not immediately depress the stock's price.

Figure 1-A shows that if no shift upwards in the present demand curve, DD , occurs and the present supply, SS , is increased, the effect will be a reduction in the price from P_0 to P_1 . The underwriter will attempt to shift the demand curve upward from DD to DD' and thereby allow an initial offering to enter the market at its equilibrium price, P_e .

Thus, if underwriters properly price initial offerings and stimulate demand correctly, initial offerings' average price movement (adjusted for a risk premium needed to induce the investor to shift capital from seasoned to unseasoned securities) should parallel the OTC Average's price movement.

FIGURE 1-A

THE EFFECTS ON EQUILIBRIUM PRICE OF AN INCREASE
IN THE NUMBER OF SHARES OUTSTANDING



Allocational efficiency between the various types of initial offering distributions (primary, secondary, and mixture) is just as important as allocational efficiency between the over-the-counter market and initial offerings. If the various types of distributions are brought to the market at their equilibrium price by the underwriter, any variations in return should be explainable by differentials in risk.

The reason one can analyze underwriters' ability or willingness to perform their allocational function efficiently or inefficiently is they have great control

over the market performance of unseasoned offerings. First, underwriters determine the offering price through negotiations with the company and/or selling stockholders. Secondly, since the general investing public has little knowledge and can obtain only limited amounts of knowledge from normal investment literature and sources, investors must rely mainly on the selling brokerage house (underwriter) for information about the firm for the first year. Determination of the offering price and major control over after-market publicity give the underwriter maximum control over initial offerings' market performance. Thus his ability or willingness to properly price and stimulate demand for all types of initial offerings can be analyzed in comparison to seasoned over-the-counter securities and between the different types of initial offering distributions.

Factors Influencing Initial Offering Pricing

A priori expectations are for a downward bias in the offering price of initial common stock offerings. The main reason for this downward bias in the offering price is that the price is not determined entirely by a competitive market. For a company going public for the first time, the price is normally determined through negotiations

between the company and/or selling stockholders and an underwriter. Because the investigation costs are high, an underwriter will not analyze a firm's potential offering unless he is the only underwriter negotiating for the offering. Also, because only after a complete analysis of the firm can an underwriter determine the offering price, the firm and/or selling stockholders must contract with an underwriter before the time an established offering price has been set. Thus, the offering price is not determined in a competitive market.

Once an underwriter has agreed to underwrite an offering, he then generally organizes a "selling group." The original underwriter, like the rest of the selling group, then becomes the broker who sells the offering to the investing public. Thus, an underwriter must satisfy both the company and/or selling stockholders and the investors (clients) who purchase the offering.

The reasons an underwriter will have a downward bias in pricing initial offerings are:

(1) The risk and time of obtaining enough members in the selling group to assure a successful offering is minimized the more the offering is undervalued. A successful offering is one that sells quickly. Since an underwriter generally must borrow large amounts to purchase the

offering, the longer it takes to sell the offering the more it costs the underwriter. Rapid turnover of borrowed capital is important to an underwriter's profitability.

(2) The discount the original underwriter will have to give the selling group members is minimized the more the offering is undervalued.

(3) The risk of having to support the stock's price in the after-market is minimized the more the offering is undervalued.

(4) The underwriter assures himself of being able to place future initial offerings and of being asked to participate in other underwriters' offerings the more his offering is undervalued.

(5) If any part of the underwriter's fees are in the form of stock or warrants, a maximum return will accrue to the underwriter the more the offering is undervalued.¹

(6) Finally, as the underwriter becomes a part of the selling group (broker), the benefit of an undervalued offering really becomes apparent. The best way a broker or underwriter can make a satisfied customer is to recommend and sell him a security that increases in price. Satisfied

¹A sample of initial offerings in 1968 showed that in 51.9 per cent of the cases underwriters had warrants in the offering. See Appendix A, Table A-2, for warrants held by underwriters.

customers tend to purchase future initial offerings and other securities.

The only constraint to the underpricing of an initial offering is the possible complaint by the issuing company and/or selling stockholders that could have received more capital from the offering. Such concern is minimized by the following:

(1) The original owners (management) desire to run the business as they see fit and to be left alone by the new stockholders. New stockholders are generally satisfied with a purchase of an offering that rises in price and tend to leave the running of the business to the original management.

(2) The original owners, like the underwriters, often receive stock options or warrants at prices close to the offering price. Given these options or warrants, they likewise benefit directly from an offering that rises substantially in price.

(3) Most corporations (selling stockholders) do not attempt to fulfill all of their planned capital (cash) needs in the initial offering. They will be able to float a future stock offering to satisfied stockholders and possibly an eager investing public if the initial offering has had a good market appreciation record.

On the basis of several strong arguments for underwriters undervaluing initial offerings and no substantial constraints, it is hypothesized that the rate of return on initial offerings less a risk premium rate for never having had a previous public market is significantly greater than the rate of return on the OTC Average.

On an a priori basis, expectations are that the investment worthiness (return per risk) of primary offerings is greater than that of secondary and mixture offerings. Mixture offerings in this study are further subdivided into mainly primary and mainly secondary, according to who receives the majority of the proceeds. The reason one would expect primary offerings to outperform secondary and mixture offerings is the degree of financial involvement of the underwriter in the various types of distributions.

The underwriter's fee is the dollar spread between the offering price and the price at which the underwriter purchases the security plus other forms of contingent fees. The main type of contingent fee is the sale of warrants to the underwriter at a nominal price, generally a penny a warrant. In most cases the warrants are exercisable at or within ten per cent of the offering price one year after the offering date and expire in three to five years.

A sample of 77 initial offerings in 1968 showed

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that in approximately 52 per cent of the offerings underwriters received warrants. More striking, however, is the fact that in 78 per cent of the cases involving primary offerings underwriters obtained warrants, while in only 17 per cent of the secondary cases did underwriters receive warrants. The above relationship held true, also, for mixture offerings. In 45 per cent of the mainly primary offerings underwriters held warrants, while in only 31 per cent of the mainly secondary offerings underwriters held warrants.¹

Thus, it is more beneficial for underwriters to have primary offerings appreciate in market price than secondary and mixture offerings. To the extent underwriters are able, through negotiating powers with the firm and/or selling stockholders, one would expect them to surpress the offering price of primary offerings in more cases than secondary or mixture offerings. Also, in the after-market the underwriter is able to publicize the offering as much as he desires. It will be beneficial for underwriters to push an offering in which they have warrants, whereas it will merely increase costs and therefore reduce their

¹See Appendix A, Table A-2, for the 1968 sample results of the percentage of offerings in which underwriters held warrants.

profits to push an offering in which they have no contingent interest.

All in all, it seems logical to assume that underwriters will be inclined to suppress the offering price and push in the after-market initial offerings in which they have a contingent interest over ones in which their fee is fixed. Should this study show that initial primary offerings significantly outperformed initial secondary and mixture offerings, the underlying reason for this may be in the general method of compensating the underwriter. Contingent fees, such as warrants, may be a poor method of compensating underwriters.

BACKGROUND AND REVIEW OF LITERATURE

The initial common stock offerings' market has long been associated with speculation and left to the large, wealthy investor who has a good cushion to fall back on if he suffers market reversals. Yet, the general public in its desire to find roads to fast riches, as buyers, gobbled up millions of dollars worth of new common stock offerings in two eras, 1961 and 1968. As a recent Forbes' writer so colorfully put it:

The great South Sea Bubble burst in 1720 and set the pattern for every financial orgy since.

Everyone with a few shillings wanted a piece of the lucrative overseas markets opening up for British investors. It was El Dorado, every man a lord. What started with a joint stock company to exploit a trading monopoly escalated into madness.¹

The Securities Act of 1933 was enacted to compel disclosure of the facts to investors. This Act relates primarily to the initial distribution, rather than to post distribution trading which is covered under the Securities Exchange Act of 1934.

The Securities Act of 1933 has two principal purposes. The first is to make available full and fair disclosure to potential investors of essential information about new offerings. The second is to protect the investor against fraud and misrepresentation. These objectives are achieved by the requirement of a registration statement which must be filed with the Securities and Exchange Commission and a prospectus which must be distributed to investors.

The Act sometimes referred to as "the-truth-in-securities act" does not take away from the citizen "his inalienable right to make a fool of himself."² The

¹"Golden Eggs? Or Lemons?" Forbes, July 15, 1969, p. 24.

²Gerald J. Robinson, Going Public: Successful Securities Underwriting (Clark Boardman Company, 1962), p. 92.

Securities and Exchange Commission, which oversees new offerings, does not pass judgment as to the offering's merit, but rather assures the investor of fair and full disclosure so that he is in the position to make a rational decision regarding an offering.

Many financial and legal authorities believe the regulation of new offerings does not go far enough to protect the general investor. A study by David Clurman,¹ Assistant Attorney General of the State of New York, analyzing 103 new offerings floated in 1968-1969 and 122 persons who bought initial offerings in New York during this period concluded:

(1) The traditional disclosure approach to the regulation of security offerings is totally ineffective. In only a minority of cases did investors state that the prospectus had any influence on their decisions.

(2) The big winners were underwriters, insiders of the companies and those who had contacts with these groups. Underwriters withheld part of the shares for their own account and then resold when they thought the market had reached its peak. In 67 per cent of the issues analyzed, underwriters obtained warrants generally at a

¹Clurman, op. cit.

price of one cent each which may be exercised at or within 10 per cent of the original offering price during a three to five year period beginning one year after the offering. As for corporate insiders, they acquired large blocks of stock at nominal prices. The average dilution in book value was 65 per cent from such purchases. Finally, 23 per cent of the insiders sold portions of their stock shortly after the issue's effective date.

(3) Brokerage memorandums were often inconsistent with offering literature and the prospectus. Where the prospectus painted a picture of substantial risk, brokerage memos talked of exchange listing for the issue.

(4) The power to allocate meant the ability to make a gift to the favorite few. Allocation was generally on the basis of the investor's past transactions.

(5) Finally, many constraints were placed on investors of new offerings. For example, they could not sell for two weeks, they had to purchase some of the issue in the after-market, and they had to take less attractive, seasoned secondary issues. All such constraints were used to initially limit supply and increase demand.

In summary, the study concludes that when initial offerings are highly attractive present laws do not protect the general investing public. Manipulation by

underwriters and brokers can readily reduce the supply of the offering. On the other hand, stimulation of demand through brokerage memorandums and tips may cause an already heated market to overheat. The effects of such manipulative practices often lead to skyrocketing prices and eventual large losses to some investors who jump in at the last moment.

To the extent this study demonstrates initial offerings and/or the various types of distributions of initial offerings to be in disequilibrium with the over-the-counter market and each other, it may add support to Mr. Clurman's results and recommendations for stronger security laws.

A large vacuum seems to exist in the investment literature concerning the performance of initial common stock offerings. The quantity of past articles on initial offerings seems to have correlated quite well with their market activity. A rash of articles appeared in 1961 and 1962 explaining how well initial offerings were doing. In the later part of 1962 a variety of articles appeared explaining why the bubble had burst. No research, in general, determined how initial offerings performed during this period. It becomes quite evident from the literature that in 1961 and 1962 any equity financing that could

legally be labeled and sold as a new offering was highly successful.

The market decline in 1962 ended the new offerings fever of 1961 and many investors in new offerings were severely burned. In fact, it took four years, 1962-1966, before the general investing public returned to the new offerings market.

The new offering fever hit again in the later part of 1967 and the early part of 1968. However, there are two main differences between the 1961 and 1968 periods. These are:

(1) Regulation A securities predominated in the 1961 market, while in the 1968 market larger distributions were offered.

(2) The 1968 era saw the so-called "go-go" and "hedge" funds gobble up new offerings.

These two differences were used by the financial world to explain how the 1968 new offerings market was stronger than the 1961 new offerings market. Larger and stronger firms were going public and a market stabilizer was built in because it was thought the funds would always take up the slack if there was a market down turn.

History has a reputation of repeating itself. Consequently, new offerings' fever ended with the market

decline in 1969. Although there have been quite a few studies on how new offerings have performed, the literature has been scanty as to how initial offerings have performed. A few small scale studies have been conducted.

Merrill, Lynch, Pierce, Fenner & Smith¹ did a study on 1961-1962 "Regulation A" new offerings and their price performance five years later. In a sample of 99 offerings from June 30, 1961, to June 30, 1962, the offering prices were compared to their November, 1967, market price. Two-thirds of the offerings showed latest quotation prices below their original offering price. The average rate of return (not computed in the study) for five years in 170.9 per cent or approximately 35.5 per cent annually.

In the study one new offering's, Lum Corporation, market price appreciated by over 9000 per cent. Thus, even if all 66 new offerings that had a decline in market price had completely failed, Lum Corporation alone would have given the sample a positive rate of return. The study tends to support the idea that a large diversified investor does all right, while the small investor assumes considerable risk when investing in new offerings. It should be noted that the study was of only small distributions and

¹"Sad Tale of Many Small Offerings of 1961-1962," Investor's Reader, November 15, 1967, pp. 14-17.

included both seasoned and unseasoned offerings.

Forbes¹ periodically prints a list of new offerings and their market performances. A list of 52 new offerings floated between January 1, and June 15, 1967, showed the following characteristics:

(1) Forty of the 52 new offerings had a price appreciation over the offering price by mid-June 1967.

(2) Seventeen had achieved gains of over 100 per cent, nine over 200 per cent, and four over 300 per cent by mid-June 1967.

(3) Finally, the mean rate of return of the 52 new offerings was 48.1 per cent by mid-June 1967.

A list of 107 new offerings floated between January 1, and August 31, 1968, showed the following characteristics:

(1) Ninety-eight out of the 107 new offerings had a price appreciation over the offering price by mid-September 1968.

(2) Forty-three had gains of over 100 per cent, 17 over 200 per cent, and ten over 300 per cent by mid-September 1968.

(3) Finally, the mean rate of return on the 107

¹"Bull Market in New Issues," Forbes, September 15, 1968, pp. 53-55.

new offerings was 108.6 per cent by mid-September 1968.

Although Forbes lists the new offerings mainly to give its readers an idea of how new offerings are performing, the articles do get the point across that when the new offerings market is "hot" new offerings fever opens the door to some fantastic investment opportunities.

The above two studies were of abnormal times and do not take into account a long enough time period to draw any conclusions as to how investors in new offerings have fared. Also, the studies included both seasoned and unseasoned offerings.

The first and only study to test fully how initial offerings have performed in the past was carried out by Reilly and Hatfield.¹ They examined all the initial common stock offerings floated during two subperiods, December 1963 to August 1964 and January 1965 to June 1965. There were 53 initial offerings floated during these two subperiods. The results of their study show that:

(1) The number of initial offerings that outperformed the market, Dow Jones Industrial Average (DJIA) or OTC Average, in the short run, first Friday after the offering and the fourth Friday after the offering, was not

¹Reilly and Hatfield, op. cit.

significantly more than could be explained by random occurrence.

(2) The investor's downside risk was slight, with substantial upside potential. The average loss, the mean loss on initial offerings that did worse than the indexes compared to the indexes, was only 2.2 per cent; while the relative gain was 20.5 per cent.

(3) The average rate of return on the initial offerings by the first Friday after offering was 9.9 per cent (DJIA, 0.3%), while the average rate of return by the fourth Friday after the offering date was only 8.7 per cent. This tends to indicate that the bulk of the short run adjustment was accomplished almost immediately after the offering.

(4) The results in the long run, one year after offering, showed initial offerings with a 43.7 per cent gain, OTC Average 23.1 per cent, and the DJIA 6.8 per cent. One interesting note was that in none of the fifty-three cases was the OTC Average down, only four times was the DJIA down, while 16 of the initial offerings declined from their offering price. Assuming risk as the probability of decline, these results would indicate that there is greater risk involved in investing in initial offerings than in investing in seasoned market securities.

(5) Comparing the 53 initial offerings to a random selection of 53 OTC stocks yielded the same results in the short and long run as when initial offerings were compared to the DJIA and the OTC Average.

(6) Finally, a strategy of purchasing just the initial offerings that gained relative to the market indexes on the fourth Friday after offering and selling them one year later proved to be the best investment strategy of all.

An obvious limitation of the Reilly and Hatfield study is that it only embraces two short subperiods of time. Although these subperiods were not considered strong periods for initial offerings, an interesting fact about the study is that initial offerings had a higher rate of return than competitive forms of investment. It seems that the strong bull market of 1964 and 1965 moved in and made initial offerings far stronger as time moved along. This would account for the fantastic results that occurred in holding initial offerings for a year.

A recent study by William R. Sloan¹ on optimum pricing of new offerings gives the mean rate of return on a sample of 347 new offerings floated in 1967 and 1968.

¹William R. Sloane, "Growth Through New Stock, Optimum Pricing, and Equivalency of Certain Valuation Models-Empirical Study," unpublished paper, Drake University, 1970.

The sample included only offerings that had a positive earnings per share figure. The results shown in Mr. Sloane's study are given in Table 1-1.

TABLE 1-1

AVERAGE PERCENTAGE CHANGE IN PRICE AFTER OFFERING

	Number of Companies	One Week	One Month	Six Months	One Year
No Previous Market	186	58.9	66.7	75.9	54.1
New York Exchange	25	15.3	18.6	18.4	21.7
Over-the- Counter	96	10.9	15.6	26.4	17.5
American Exchange	40	3.0	2.2	6.8	-7.3
Total	347	36.0	41.6	50.1	34.5

Although these results were only a by-product of Professor Sloane's study, they do point out the enormous returns initial offerings showed as compared to seasoned security offerings.

The major limitation of this data is its short time duration and the fact that it was done during an abnormally bullish market. Also, the Sloane sample included only

firms that had positive earnings per share.

Finally, a study by Irwin Friend of the price performance of both seasoned and unseasoned common stock offerings between 1958-1962 concluded:

On the basis of evidence presented in this Study, it appears that, with one notable exception, both the average price experience of and the overall rate of return on new stock issues in recent years were reasonably close to those of comparable outstanding issues.¹

The exception was industrial primary issues. They performed poorly compared to the general market. Friend's study included both seasoned and unseasoned common stock offerings. His results cannot be used to reach a conclusion on whether unseasoned common stock offerings (initial offerings as defined in this study) were in equilibrium with other capital markets in the late fifties and early sixties.

It is the past confusion in initial common stock offering performance that this study hopes to resolve. Both Reilly and Hatfield's and Friend's study showed that new offerings perform in a close parallel to the market. Forbes' and Sloane's data showed initial offerings to have superior results to other offerings. The major contribution this study will make is to test whether or not the

¹Irwin Friend, Investment Banking and the New Issues Market Summary Volume (University of Pennsylvania, 1965), p. 78.

initial common stock offerings portion of the capital markets has been in equilibrium with the over-the-counter market and the extent to which certain various types of initial offerings distributions have been in equilibrium with each other.

CHAPTER 2

RESEARCH DESIGN

Methodology

Stated briefly, the methodology is concerned with analyzing:

- (1) The overall returns and risk associated with initial offerings,
- (2) The past relative market performance of initial offerings with that of the over-the-counter market, and
- (3) The past returns and risk (investment worthiness) associated with the three basic types of initial offering's distributions.

The first objective is to examine the past returns and risk associated with initial common stock offerings. The second objective is to determine if the initial offerings' market performance has paralleled the over-the-counter's market performance. It will be statistically determined whether the mean performance relative indexes of these securities differs from the population mean of

1.0 at some pre-determined degree of confidence.¹

Since initial offerings are not exactly homogeneous, a third objective is to analyze the returns and risk of the various types of initial offering's distributions. Initial offerings are stratified into four types of stock distributions. These are:

- (1) Primary,
- (2) Mainly primary,
- (3) Mainly secondary
- (4) Secondary.

The test will be to determine statistically whether the return per risk (investment worthiness) of each type differs significantly from one another at some pre-determined degree of confidence. In other words, can variations in return between the various types of initial offering distributions be explained by differentials in risk?

In the first objective the past market performance and risk of initial offerings will be presented to demonstrate how investors have fared.

Given a significance level (α) equal to .05, the null hypothesis (H_0) for the second objective is that the mean performance relative of initial offerings and the

¹The performance relative index is equal to the rate of return on an initial offering (adjusted for a risk premium) for a certain time period divided by the OTC Average's rate of return for the same time period. If both the offering and the market are moving together the index should equal 1.0.

over-the-counter market will not differ significantly from the population mean of 1.0; in other words, the market rate of return on initial offerings after being adjusted for the risk premium rate of return (θ) is the same as the market rate of return for the over-the-counter securities. The alternative hypothesis (H_1) is that the mean performance relative does vary significantly from the population mean of 1.0.

The null hypothesis (H'_0) for the third objective is that the mean returns of the four types of initial offerings do not differ from one another, and the coefficients of variability (σ/μ), risk,¹ of the four types of initial offerings do not differ from one another; in other words, the investment worthiness of all four types of initial offerings is the same. The alternative hypothesis (H'_1) is that the four types of initial offerings do vary significantly in their respective investment worthiness.

Procedural Steps

The basic procedural steps in testing the null hypothesis (H_0) and (H'_0) are shown below.

¹Since relative variability measures both upward and downward price movements and few investors are adverse to upward movements, a second measure of risk, the probability of decline, will also be used.

Step 1. A random sample of 400 initial common stock offerings (X_i) is drawn. The sample covers the four and one-half year period from January 1, 1965, to June 30, 1969. The universe includes only those initial offerings listed in the Over-the-Counter Securities Review.¹

$$X_i = (X_1, X_2, X_3, \dots, X_{400}).$$

Step 2. The offering price, offering date, number of shares floated, type of offering (primary, mainly primary, mainly secondary, secondary), and the price/earnings ratio of the firms that had positive earnings for three years prior to their offering date are recorded for the 400 initial offerings.

Step 3. The National Quotation Bureau's Over-the-Counter Industrial Average (N_j) is recorded on the offering date of each of the above corresponding initial offerings.

$$N_j = (N_1, N_2, \dots, N_{400}).$$

Step 4. The price for each of the initial offerings and the corresponding N. Q. B. Over-the-Counter Industrial Average (OTC) is recorded on the following dates:

- a. The first Tuesday following the offering ($t=1$).
- b. The second Tuesday following the offering ($t=2$).

¹Over-the-Counter Securities Review (published monthly by Review Publishing Co., Jenkintown, Pa.), January, 1965 - July, 1969.

c. The third Tuesday following the offering (t=3).

⋮

m. Three months following the offering (t=13).

n. Six months following the offering (t=14).

o. Nine months following the offering (t=15).

p. One year following the offering (t=16).

These price data were gathered from the Commercial and Financial Chronicle.¹

Step 5. The rate of return for each initial offering ($R_{X_i t}$) and the OTC Average ($R_{N_j t}$) is computed for the sixteen time periods defined in Step 4.

Step 6. The mean rate of return is computed for:

a. Initial offerings,

$$\bar{R}_{X_t} = 1/400 \sum_{i=1}^{400} R_{X_i t}, \text{ for } t=1, \dots, 16.$$

b. OTC Average,

$$\bar{R}_{N_t} = 1/400 \sum_{j=1}^{400} R_{N_j t}, \text{ for } t=1, \dots, 16.$$

Step 7. The price earnings ratio for the N. Q. B. OTC Average is computed in the following manner:²

¹In the first quarter of 1965, before the Thursday edition of the Chronicle began listing new offerings, these price data were gathered on Friday instead of Tuesday from the Monday edition of the Chronicle.

²See Appendix E for computation of the National Quotation Bureau Over-the-Counter price/earnings ratio.

a. By recording the yearly average price/earnings ratio for the 35 companies in the Average on January 1, 1969, as given by the Value Line Investment Survey for the years 1965, 1966, 1967, 1968, and 1969.

b. By calculating the average price/earnings ratio of the 35 companies for each of the above years. This is simply the summation of the firm's individual price/earnings ratio for a given year divided by 35.

c. Finally, by weighting each year's average price/earnings ratio by the percentage of initial offerings floated in that particular year and totaling these to obtain an overall mean price/earnings for the Average that is equivalent in time to the price/earnings ratio of initial offerings.

Step 8. The "risk premium rate of return" is calculated by the spread between the mean OTC Average's P/E ratio (PEN) as computed in Step 7 and the mean initial offerings' P/E ratio (PEI) for those initial offerings that have had a positive earnings figure for three years prior to the offering date.¹

$$PEI = 1/e \sum_{k=1}^n PE_k$$

$$\theta = (PEN - PEI) / PEI$$

¹See Appendix E for computation of the "risk premium rate of return."

where:

n = the number of initial offerings with three years of positive earnings prior to the offering date.

PE_k = the price/earnings ratio of the k^{th} initial offering.

Step 9. The performance relative index (PR_{rt}) is computed for all the 400 initial offerings for the sixteen time periods:

$$PR_{rt} = \frac{X_{it}/N_{jt}}{(X_{i0} + \theta_{i0})/N_{j0}},$$

where: $r = i = j = 1, 2, 3, \dots, 400.$

X_{i0} = The offering price of initial offering X_i .

N_{j0} = The OTC Average at the offering date of initial offering X_i .

X_{it} = The market price of initial offering X_i at time period t .

N_{jt} = The OTC Average at time period t .

θ = The risk premium rate of return.

PR_{rt} = The performance relative index of initial offering X_i .

Step 10. The mean performance relative is calculated for the sixteen time periods.

$$\bar{PR}_t = 1/400 \sum_{r=1}^{400} PR_{tr}$$

Step 11. The standard error of the population mean ($\sigma_{\overline{PR}_t}$) is estimated as follows:

$$\sigma_{\overline{PR}_t} = s/20$$

where:

s = the standard deviation of the mean performance relative.

Step 12. The random sample of 400 initial offerings is stratified as follows:

a. Primary offerings, $XP_a = (XP_1, XP_2, \dots, XP_e)$,

where e = the number of primary offerings.

b. Mainly primary offerings, $XMP_b = (XMP_1, XMP_2, \dots, XMP_f)$, where f = the number of mainly primary offerings.

c. Mainly secondary offerings, $XMS_c = (XMS_1, XMS_2, \dots, XMS_g)$, where g = the number of mainly secondary offerings.

d. Secondary offerings, $XS_d = (XS_1, XS_2, \dots, XS_h)$, where h = the number of secondary offerings, $e+f+g+h=400$.

Step 13. The mean rate of return for the sixteen time periods is computed for each of the stratified groups above:

$$a. \quad \overline{R}_{XP_t} = 1/e \sum_{a=1}^e R_{XP_{at}}$$

$$b. \quad \overline{R}_{XMP_t} = 1/f \sum_{b=1}^f R_{XMP_{bt}}$$

$$c. \quad \bar{R}_{XMS_t} = 1/g \sum_{c=1}^g R_{XMS_{ct}}$$

$$d. \quad \bar{R}_{XS_t} = 1/h \sum_{d=1}^h R_{XS_{dt}},$$

where $R_{XP_{at}}$ is the rate of return on the a^{th} primary offering at time t .

Step 14. For each of the sixteen time periods the initial offerings' mean rate of return standard deviation is computed for each of the stratified samples as follows:

$$a. \quad s_{\bar{R}_{XP_t}} = \frac{e}{\sum_{a=1}^e} \sqrt{(R_{XP_{at}} - \bar{R}_{XP_t})^2 / e}$$

$$b. \quad s_{\bar{R}_{XMP_t}} = \frac{f}{\sum_{b=1}^f} \sqrt{(R_{XMP_{bt}} - \bar{R}_{XMP_t})^2 / f}$$

$$c. \quad s_{\bar{R}_{XMS_t}} = \frac{g}{\sum_{c=1}^g} \sqrt{(R_{XMS_{ct}} - \bar{R}_{XMS_t})^2 / g}$$

$$d. \quad s_{\bar{R}_{XS_t}} = \frac{h}{\sum_{d=1}^h} \sqrt{(R_{XS_{dt}} - \bar{R}_{XS_t})^2 / h}$$

Step 15. The standard error of the population mean ($\sigma_{\bar{R}}$) is estimated for each of the four stratified groups as follows:

$$a. \quad \sigma_{\bar{R}_{XP_t}} = s_{\bar{R}_{XP_t}} / \sqrt{e},$$

$$b. \quad \sigma_{\bar{R}_{XMP_t}} = s_{\bar{R}_{XMP_t}} / \sqrt{f},$$

$$c. \quad \sigma_{\overline{R_{XMS}_t}} = s_{\overline{R_{XMS}_t}} / \sqrt{g},$$

$$d. \quad \sigma_{\overline{R_{XS}_t}} = s_{\overline{R_{XS}_t}} / \sqrt{h}.$$

Step 16. The coefficient of variation (V_X) is calculated for the four stratified groups as follows:

$$a. \quad V_{XP_t} = \sigma_{\overline{R_{XP_t}}} / \mu_{XP_t},$$

$$b. \quad V_{XMP_t} = \sigma_{\overline{R_{XMP_t}}} / \mu_{XMP_t}$$

$$c. \quad V_{XMS_t} = \sigma_{\overline{R_{XMS_t}}} / \mu_{XMS_t},$$

$$d. \quad V_{XS_t} = \sigma_{\overline{R_{XS_t}}} / \mu_{XS_t}.$$

Step 17. The probability of decline ($P(X)$) is calculated for each of the four stratified groups as follows:

$$a. \quad P(XP) = u_t/e,$$

$$b. \quad P(XMP) = w_t/f,$$

$$c. \quad P(XMS) = y_t/g,$$

$$d. \quad P(XS) = z_t/h, \quad \text{where } u, w, y, z \text{ are equal to}$$

the number of primary, mainly primary, mainly secondary, and secondary offerings respectively that are below their price at time t .

Step 18. Given a pre-determined level of significance (α) equal to .05, the null hypothesis (H_0) is:

$$H_0: \mu_{PR_t} \leq 1.0, \text{ where } t=1,2,\dots,16.$$

$$H_1: \mu_{PR_t} > 1.0.$$

If the difference between the population mean (1.0) and the sample mean (μ_{PR_t}) is less than $+1.645\sigma_{\overline{PR_t}}$, the performance of initial common stock offerings will be considered to be equivalent to, or lower than, the performance of the over-the-counter market. If the difference between the population mean and the sample mean is greater than $+1.645\sigma_{\overline{PR_t}}$, the performance of the initial common stock offerings will be considered to be superior to the over-the-counter market's performance in the last four and one-half years. Thus, the two capital markets are in disequilibrium if the investment worthiness of initial offerings is greater than that of the general over-the-counter market.

Step 19. A two step approach is used to test the null hypotheses:

$$H_0: \mu_{XP_t} \leq \mu_{XMP_t},$$

$$\mu_{XP_t} \leq \mu_{XMS_t},$$

$$\mu_{XP_t} \leq \mu_{XS_t},$$

$$H_0^1: V_{XP_t} > V_{XMP_t} \quad \text{or} \quad P(XP) > P(XMP),$$

$$V_{XP_t} > V_{XMS_t} \quad \text{or} \quad P(XP) > P(XMS),$$

$$V_{XP_t} > V_{XS_t} \quad \text{or} \quad P(XP) > P(XS),$$

$$H_1: \mu_{XP_t} > \mu_{XMP_t},$$

$$\mu_{XP_t} > \mu_{XMS_t},$$

$$\mu_{XP_t} > \mu_{XS_t},$$

$$H_1: V_{XP_t} \leq V_{XMP_t} \quad \text{or} \quad P(XP) \leq P(XMP),$$

$$V_{XP_t} \leq V_{XMS_t} \quad \text{or} \quad P(XP) \leq P(XMS),$$

$$V_{XP_t} \leq V_{XS_t} \quad \text{or} \quad P(XP) \leq P(XS).$$

Step 19A. The relationship of the means in the first part is tested by the t-test.

$$t_v = \frac{\bar{R}_{XP_t} - \bar{R}_{XMP_t}}{\sqrt{\frac{s^2_{\bar{R}_{XP}}}{e} + \frac{s^2_{\bar{R}_{XMP}}}{f}}}$$

where

$$v = \frac{\left(\frac{s^2_{\bar{R}_{XP}}}{e} + \frac{s^2_{\bar{R}_{XMP}}}{f} \right)^2}{\frac{\left(\frac{s^2}{e} \right)^2}{e-1} + \frac{\left(\frac{s^2}{f} \right)^2}{f-1}} - 2.$$

If t'_v is less than $t'_{\alpha, v}$ the null hypothesis is accepted and when initial primary offerings' mean rate of return was greater than the mean rate of return of initial mainly primary, mainly secondary, or secondary offerings this may have been due to chance. If t'_v is greater than $t'_{\alpha, v}$ the null hypothesis is rejected and initial primary

offerings' mean rate of return is statistically greater than that of the mean rate of return on initial mainly primary, mainly secondary, or secondary offerings. A rejection of the null hypothesis in the first part does not lead to the conclusion that the investment worthiness of initial primary offerings has been greater than that of initial mainly primary, mainly secondary, or secondary offerings. The second part of the hypotheses must be tested and the null hypothesis rejected in order to draw any conclusions as to their superior investment worthiness.

Step 19B. No statistical test that compares the coefficients of variation of two samples was found. Thus, it will be assumed that when the coefficient of variation of primary offerings is equal to or less than the coefficient of variation on initial mainly primary, mainly secondary, and secondary offerings, the null hypothesis will be rejected. That is, the risk of relative variability in initial primary offerings is equal or less than that of other types of distributions. If the coefficient of variation of initial primary offerings is greater than the coefficient of variation for initial mainly primary, mainly secondary, or secondary offerings, then the null hypothesis will be accepted and the risk in primary offerings is shown to be greater than that in initial

mainly primary, mainly secondary, or secondary offerings. To measure the probability of decline, a Z-test will be used in those cases in which the percentage of initial primary offerings that declined was greater than the percentage of initial mainly primary, mainly secondary, or secondary offerings.

Thus, if we are to conclude that initial primary offerings investment worthiness has been greater than other distributions, the mean rate of return must be sufficiently greater, while the coefficient of variation or probability of decline (risk) must be equal or less than the other distributions.

The basic methodology has been concerned with the following three areas: analyzing the return and risk of initial common stock offerings, their performance relative to the performance of the over-the-counter market, and finally, the past return and risk associated with the different types of distributions.

CHAPTER 3

ANALYSIS OF RESULTS

In the past four and one-half years initial common stock offerings have been in disequilibrium with the over-the-counter market. Also, initial primary offerings' investment worthiness has been significantly greater than the investment worthiness of initial secondary and mixture offerings.

Underwriters have failed to set a realistic offering price on initial offerings in the period during this study. Underwriters either have:

- (1) Been unable to place a realistic value on a firm's assets and future earnings, or
- (2) Been unable to anticipate the strong overall market conditions and great investor acceptance of initial offerings, or
- (3) Abused their negotiating and/or after market publicity powers in such a manner as to reap enormous profits on initial offerings in which they held financial interest (warrants).

Judging from the performance of initial offerings shown in this study, it would be in society's best interest if some aspects of investment banking are changed. The problems lie probably in the method of determining the offering price and the method of compensating underwriters. Underwriters should be financially independent of the after-market price performance of initial offerings. Contingent fees result in a conflict of interest and should be disallowed.

A solution to the present problem of determining the offering price may be to compensate an underwriter or some other independent person or firm for drawing up a red herring. Then underwriters bid on all or any portion of the offering in the same manner treasury bills are sold.

Return and Risk of Initial Offerings -- Short Run

A random sample of 400 initial common stock offerings¹ was drawn from the universe of initial offerings as reported in the Over-the-Counter Securities Review.² The total period covered by the study extended from January 19, 1965 (when the first initial offering was selected) to

¹See Appendix B for the complete list of companies in the sample.

²Over-the-Counter Securities Review, op. cit.

June 30, 1970 (a year after the last initial offering was selected). The short run was defined as from one week to three months; the long run was defined as from six months to one year after the offering date.

The initial common stock offerings' mean rates of return varied from 32.43 per cent for one week to 54.65 per cent for three months after the offering date. The short run mean rates of return of all 400 initial offerings are presented in Table 3-1.

The mean rates of return on initial offerings increased week by week from almost 33 per cent in the first week to over 50 per cent by three months after the offering date. Thus, the mean rates of return increased as the period of time they were outstanding increased.

During this same period, on the other hand, the OTC Average's mean rates of return varied from 0.14 per cent for one week to 1.09 per cent for three months. The short run mean rates of return are presented in Table 3-1.

In the short run the mean rates of return on initial offerings significantly outperformed the mean rates of return on the OTC Average.

Two measures of risk were used. These measures were coefficient of variation (σ/μ) and probability of decline ($P(D)$). The use of coefficient of variation as a

TABLE 3-1

SHORT TERM RETURN OF INITIAL OFFERINGS AND OTC AVERAGE

Time t	Percentage Mean Rate of Return*	
	Initial Offerings (Sample Size = 400)	Over-the-Counter Average
	μ_X	μ_N
One Week	32.43	0.14
Two Weeks	35.78	0.27
Three Weeks	36.42	0.43
Four Weeks	38.20	0.50
Five Weeks	39.34	0.66
Six Weeks	40.80	0.77
Seven Weeks	42.88	0.88
Eight Weeks	44.88	0.96
Nine Weeks	46.85	1.05
Ten Weeks	49.01	1.03
Eleven Weeks	50.99	1.08
Twelve Weeks	52.32	1.02
Three Months	54.65	1.09

*The mean rate of return is the percentage change in the market price of the sample from its offering price to its price at time periods one week, two weeks,..... three months. The rates are not annualized.

measurement of risk has its limitations. Perhaps the most objectionable feature of the coefficient of variation is that investors are not interested in total relative dispersion of expected returns, but rather in the probability of certain types of adverse returns. Thus, as a check of coefficient of variation probability of decline was used as a measure of risk. Market price decline is certainly something all investors in initial offerings desire to avoid.

Both measures of risk showed that a portfolio of stock consisting of the OTC Average presented greater risk than a portfolio of initial offerings. The coefficients of variation and probabilities of decline for both initial offerings and the OTC Average are shown in Table 3-2. For initial offerings the coefficients of variation ranged from 0.00722 for one week to 0.0860 for three months after the offering date. On the other hand, the coefficients of variation for the OTC Average ranged from 0.9285 for the first week to 0.40367 for three months after the offering date. Thus, initial common stock offerings have had less risk associated with them than the OTC Average.

When probability of decline was used as the measure of risk, similar results as above occur. In approximately 45 per cent of the cases the OTC Average was below its original starting level in the short run. While there was close to a 50 per cent chance that the OTC Average declined below its starting point, the percentage of initial offerings that declined below their offering priced varied from a low of 23.75 per cent within the first week to a high of 29.25 eight weeks after the offering date.

Clearly, one can conclude that initial common stock offerings have been a better investment than the OTC Average in the short run. Initial offerings have yielded

TABLE 3-2

SHORT TERM RISK OF INITIAL OFFERINGS AND OTC AVERAGE

Time t	Coefficient of Variation		Probability of Decline	
	Initial	OTC	Initial	OTC
	Offerings σ_X/μ_X	Average σ_N/μ_N	Offerings P (X)	Average P (N)
One Week	0.0722	0.9286	0.2375	0.4375
Two Weeks	0.0715	0.6667	0.2750	0.4275
Three Weeks	0.0771	0.4884	0.2775	0.4375
Four Weeks	0.0784	0.4800	0.2850	0.4475
Five Weeks	0.0794	0.4091	0.2900	0.4400
Six Weeks	0.0796	0.3896	0.2950	0.4525
Seven Weeks	0.0782	0.3523	0.2850	0.4575
Eight Weeks	0.0794	0.3438	0.2925	0.4525
Nine Weeks	0.0793	0.3333	0.2750	0.4650
Ten Weeks	0.0813	0.3689	0.2800	0.4625
Eleven Weeks	0.0843	0.3889	0.2850	0.4550
Twelve Weeks	0.0872	0.4216	0.2775	0.4775
Three Months	0.0853	0.4037	0.2800	0.4750

greater returns and have had less risk associated with them.

Return and Risk of Initial Offerings -- Long Run

In the long run (six months, nine months, and one year) similar conclusions to the short run results can be drawn. The initial offerings mean rates of return in the long run were 62.30, 64.33, and 59.48 per cent for six months, nine months, and one year respectively. The mean rates of return, standard deviations, coefficients of variations, and probabilities of decline are presented in Table 3-3.

TABLE 3-3

LONG TERM RETURN AND RISK OF INITIAL COMMON STOCK OFFERINGS

Time t	Percentage Mean Rate of Return μ_X	Standard Deviation σ_X	Coefficient of Variation σ_X/μ_X	Probability of Decline P(X)
Six Months	62.30	0.0536	0.0860	0.3175
Nine Months	64.33	0.0666	0.1035	0.3750
One Year	59.38	0.0794	0.1335	0.4175

The mean rates of return on the OTC average, however, for the long run were only 3.29, 6.83, and 6.08 per cent respectively. The mean rates of return, standard deviations, coefficients of variations, and probabilities of decline are presented in Table 3-4.

TABLE 3-4

LONG TERM RETURN AND RISK OF THE NATIONAL QUOTATION BUREAU
OVER-THE-COUNTER INDUSTRIAL AVERAGE

Time t	Percentage Mean Rate of Return μ_N	Standard Deviation σ_N	Coefficient of Variation σ_N/μ_N	Probability of Decline P(N)
Six Months	3.29	0.0062	0.1884	0.4425
Nine Months	6.83	0.0071	0.1040	0.3975
One Year	6.08	0.0091	0.1497	0.4050

For both measures of risk, coefficient of variation and probability of decline, initial offerings in the long run had approximately the same/or less risk than the OTC Average. In the long run the coefficients of variation for the OTC Average were 0.1884, 0.1040, and 0.1497 (see Table 3-4), while for initial offerings they were 0.0860, 0.1038, and 0.1335 (see Table 3-3) for six months, nine months, and one year after the offering date respectively.

The probabilities of decline for the OTC Average were 44.25, 39.75, and 40.50 per cent (see Table 3-4), while the probabilities of decline for initial offerings were 31.75, 37.75, and 41.75 per cent (see Table 3-3) for six months, nine months, and one year after the offering date respectively. Therefore, one can conclude that the mean rate of return on initial common stock offerings significantly outperformed the OTC Average and offered relatively the same/or less risk to the investor in the long run.

Performance Relative Analysis

J. B. Williams¹ said that an investor evaluates the future returns expected for each stock, then discounts these for time and risk to establish the highest price he

¹John Burr Williams, The Theory of Investment Value (Amsterdam: North-Holland Publishing Company, 1938).

will pay for the security, and the number of shares he will buy at that price. Where prices are lower than this maximum price, he may buy additional shares since the issue then offers to him, based on his expectations, risk evaluation, and the rates presently available in the market, a premium return. For a seasoned security all of the above is accomplished by a free auction market between many investors, such that the marginal investor sets the security's price at any moment in time. However, for an unseasoned security (initial offering) this is not true. The offering price is determined through negotiations between an underwriter and the firm and/or selling stockholders. Theoretically, the objective of the underwriter should be to evaluate the future returns and discount them at the going market rate of return for time and risk to establish the highest price at which the securities can be floated to the public.

In order to test whether or not initial offerings have been properly priced a performance relative index was developed. The index adjusted initial offerings for the additional risk to the investor who has no previous public market record for reference in analyzing past investor appraisal of a firm's value. The performance relative index is:

$$PR_{rt} = \frac{X_{it}/N_{jt}}{(X_{i0} + \theta X_{i0})/N_{j0}},$$

or rewriting the performance relative index as:

$$PR_{rt} = \frac{X_{it}/(X_{i0} + \theta X_{i0})}{N_{jt}/N_{j0}},$$

it becomes clearer that the performance relative index relates the change in price of an initial offering, adjusted for the risk premium rate of return, to the change in the OTC Average between the offering date and any other date, t .

It is hypothesized that the market price performance of initial offerings, adjusted for a risk premium, in the period between January 1, 1965, and June 30, 1970, has performed in a manner superior to that of the OTC Average. The OTC Average is assumed to represent the mean performance of the population. The expectation is that the mean performance relative of initial offerings adjusted for a risk premium will be significantly greater than the population mean of 1.0.

The risk premium rate of return is the discount underwriters provide to investors to induce them to shift investment capital from seasoned to unseasoned securities. The risk premium may be needed to compensate the investor for the additional time and effort he must exert in

analyzing an initial offering as an investment opportunity.¹

It is assumed that the risk premium given by underwriters in the past has been in the form of a lower price/earnings ratio on initial offerings relative to the price/earnings ratio on existing over-the-counter securities.

The risk premium is calculated by the spread between the price/earnings ratio of initial offerings and the OTC

Average's price/earnings ratio for the same time period.²

The risk premium was calculated to be 13.2 per cent.³

¹The reasons additional time and effort would be needed in analyzing initial offerings is because of the lack of availability of facts about the firm through the normal investment sources. An investor must either exert additional effort to obtain these facts or rely on the underwriter's recommendations and past record. Also, past price patterns (movements) are not available to the investor.

²In calculating the average price/earnings ratio on initial offerings, only offerings that had three consecutive years of positive earnings were used. The price/earnings ratio was calculated by dividing the offering price by the offering's last years earnings per share.

³See Appendix E for the actual computation of the risk premium. In the past the risk premium may or may not have been correct. It might have been that a lower discount could have been used. This would mean that the mean performance relative indices were too low and the initial offerings performance relative to the OTC Average would have been greater than calculated in this study. On the other hand, one might argue that a higher risk premium was needed in the past. However, this study would indicate that until the risk premium approximated 38 per cent initial offering would have outperformed the OTC Average. Any risk premium below 38 per cent would mean initial offerings were in disequilibrium with the OTC Average.

This study has already shown that the investor's risk on initial offering has been the same/or less than on that on the OTC Average. Therefore, the market price appreciation on initial offerings adjusted for the risk premium should be equivalent to that of the OTC Average's market price appreciation.

Any return on initial offerings after the 13.2 per cent risk premium adjustment greater than the return on the OTC Average, in this study, would mean investors would have been receiving economic rent. The reasons for this economic rent may be any one or a combination of the following:

- (1) Over speculation by investors in initial offerings at certain times,
- (2) Under pricing of initial offerings by underwriters,¹
- (3) Over stimulation of this particular area of the stock market by underwriters and brokers.

The population mean performance relative is 1.0 because if initial offerings' mean market rate of return adjusted for the risk premium is equal to the OTC Average's

¹It may have been that the initial offerings' actual value had been above the price/earnings ratio of the OTC Average's price/earnings ratio because of initial offerings greater future earnings growth potential.

mean rate of return the performance relative index would equal 1.0.

A difference between the mean performance relative of initial offerings and the population mean of 1.0 will be considered significant if it can not reasonably be attributed to chance. For tests of significance of differences, the assumption is that the average performance relatives ($\overline{PR}_t$) has a probability distribution with mean (μ_{PR_t}) and variance $\sigma_{\overline{PR}}^2/400$ and thus by the Central Limit Theorem is approximately normally distributed.

The data presented in Table 3-5 in this chapter includes the mean performance relatives, the standard deviations of this mean, and the acceptances or rejections for 16 time periods of the following test:

$$H_0: \mu_{PR} \leq 1.0$$

$$H_1: \mu_{PR} \geq 1.0$$

In order to test for significance, the standard error of the population mean ($\sigma_{\overline{PR}_t}$) must be estimated as follows:

$$\sigma_{\overline{PR}_t} = s/\sqrt{n} ,$$

where s is the standard deviation of the mean performance relative and n is the number of initial offerings (400). The difference between the population mean and the sample mean will be considered to be due to chance if it is less

TABLE 3-5

MEAN PERFORMANCE RELATIVES

$$H_0: \mu_{PR} \leq 1.0 \quad \theta = 0.1320 \quad H_1: \mu_{PR} > 1.0$$

Time					
	1	2	3	4	5
	Mean Performance Relative μ_{PR}	Mean Performance Relative Less 1.0 $\mu_{PR} - 1.0$	Standard Deviation σ	1.645 S.D. 1.645 σ	Accept $2 \leq 4$ Reject $2 > 4$
One Week	1.1696	0.1696	0.0210	0.03455	Reject
Two Weeks	1.1975	0.1975	0.0229	0.03767	Reject
Three Weeks	1.2001	0.2001	0.0248	0.04080	Reject
Four Weeks	1.2140	0.2140	0.0262	0.04310	Reject
Five Weeks	1.2216	0.2216	0.0272	0.04474	Reject
Six Weeks	1.2325	0.2325	0.0282	0.04639	Reject
Seven Weeks	1.2501	0.2501	0.0293	0.04820	Reject
Eight Weeks	1.2661	0.2661	0.0310	0.05100	Reject
Nine Weeks	1.2819	0.2819	0.0323	0.05313	Reject
Ten Weeks	1.3011	0.3011	0.0348	0.05725	Reject
Eleven Weeks	1.3175	0.3175	0.0374	0.06152	Reject
Twelve Weeks	1.3279	0.3279	0.0395	0.06498	Reject
Three Months	1.3475	0.3475	0.0406	0.06679	Reject
Six Months	1.3792	0.3792	0.0443	0.07287	Reject
Nine Months	1.3482	0.3482	0.0528	0.08686	Reject
One Year	1.2952	0.2952	0.0605	0.09955	Reject

than $1.645\sigma_{\overline{PR}}$.

Empirical Results. In both the short and long run the mean performance relative of initial offerings adjusted for a 13.2 per cent risk premium rate of return significantly outperformed the population mean of 1.0. Table 3-5 presents this data. The Table includes the mean performance relatives, the mean performance relatives less 1.0, the standard deviations of the mean performance relatives, 1.645 times the standard deviations, and whether to accept or reject the null hypotheses.

Table 3-5, also, shows that as the time period initial offering were outstanding increased the mean performance relatives became larger. This would indicate that the return on initial offerings relative to the return on the OTC Average increased as the period of time initial offerings were outstanding increased. The mean performance relatives ranged from a low of 1.1696 in the first week to a high of 1.3792 six months after the offering date. After six months initial offerings performed better than the market, but in relation to the first six months they did not perform as well. The mean performance relative for nine months (1.3482) was below the six-month's figure (1.3792); while the mean performance for one year (1.2952) was below the nine-month's figure (1.3482). Initial

offerings seem to have peaked relative to the market at approximately six months.

Initial offerings in the last four and one-half years (January 1, 1965, to June 30, 1969) have been significantly undervalued and the investors able to obtain initial offerings during this period have been either knowingly or unknowingly handed a nice gift from the investment bankers.

All in all, it can be concluded that initial offerings have been in disequilibrium with the rest of the over-the-counter market and that economic rent has been given to investors in this area. The logical reason for this economic rent is that the offering price has not been determined, as with seasoned over-the-counter securities, by a free auction but rather by negotiations between an underwriter and the firm and/or selling stockholders.

Types of Distribution Analysis

The test of allocational efficiency within the initial common stock offerings sector of the capital markets involves stratifying the original initial offerings' sample into the various types of distributions. There are three basic types of distributions. These are: primary offerings, secondary offerings, and mixture

offerings. Mixture offerings have been further divided into mainly primary offerings, those in whose 50 to 99 per cent of the proceeds go to the company, and mainly secondary offerings, those in which one to 49 per cent of the proceeds go to the company. If the initial offerings portion of the capital markets is functioning properly, all four classifications should perform in approximately the same manner. In other words, their investment worthiness (return per risk) should be the same.

It is hypothesized that the investment worthiness of primary offerings has in the past been superior to the investment worthiness of initial mainly primary, mainly secondary, and secondary offerings. A better investment is one that offers either a greater return and the same/ or less risk, or the same return and less risk.

A two step approach will be used to test the above hypothesis. The first test is:

$$H_0: \mu_{XP_t} \leq \mu_{XMP_t}$$

$$\mu_{XP_t} \leq \mu_{XMS_t}$$

$$\mu_{XP_t} \leq \mu_{XS_t}.$$

$$H_1: \mu_{XP_t} > \mu_{XMP_t},$$

$$\mu_{XP_t} > \mu_{XMS_t},$$

$$\mu_{XP_t} > \mu_{XS_t}.$$

For testing purposes a .05 level of significance will be used. A rejection of the null hypothesis in all three cases would mean that, in the past, the mean rate of return on initial primary offerings has been significantly greater than the mean rate of return on initial secondary and mixture distributions.

The second test is:

$$H_0: V_{XP_t} > V_{XMP_t} \quad \text{or} \quad P(XP_t) > P(XMP_t),$$

$$V_{XP_t} > V_{XMS_t} \quad \text{or} \quad P(XP_t) > P(XMS_t),$$

$$V_{XP_t} > V_{XS_t} \quad \text{or} \quad P(XP_t) > P(XS_t).$$

$$H_1: V_{XP_t} \leq V_{XMP_t} \quad \text{or} \quad P(XP_t) \leq P(XMP_t),$$

$$V_{XP_t} \leq V_{XMS_t} \quad \text{or} \quad P(XP_t) \leq P(XMS_t),$$

$$V_{XP_t} \leq V_{XS_t} \quad \text{or} \quad P(XP_t) \leq P(XS_t).$$

A rejection of the null hypothesis of part two would mean that the market risk to investors associated with initial primary distributions, in the past, has been the same/or less than the market risk associated with initial mainly primary, mainly secondary, and secondary distributions.

Finally, a rejection of the null hypothesis in part one coupled with a rejection of the null hypothesis

in the second part, would lead to the conclusion that the investment worthiness of initial primary distributions has been greater than that of initial mainly primary, mainly secondary, and secondary distributions. This would mean that the variations in returns between the various types of initial offering distributions can not be explained by differentials in risk.

Empirical Results. Table 3-6 presents a week by week breakdown of the mean rates of return for the initial stock offerings sample, initial primary offerings, initial mainly primary offerings, initial mainly secondary offerings, and initial secondary offerings for sixteen time periods.

It can easily be seen that the mean rates of return on initial primary offerings have been superior in all time periods to the mean rates of return on the other stratified types of distributions. Table 3-6, also, shows that the greatest relative differential in mean returns existed in the first few weeks; over time this relative mean rate of return between primary offerings and the total sample, mainly primary, and secondary offerings became smaller. For example, the first week's mean rate of return on initial primary offerings (46.1%) was three times greater than the mean rate of return on initial

TABLE 3-6

MEAN RATE OF RETURN*

Time t	All Offerings μ_X	Primary μ_{XP}	Mainly Primary μ_{XMP}	Mainly Secondary μ_{XMS}	Secondary μ_{XS}
Sample Size	400	181	101	65	53
One Week	32.43%	46.13%	25.68%	18.60%	15.48%
Two Weeks	35.78	50.88	27.77	21.23	17.31
Three Weeks	36.42	51.38	29.46	20.25	18.40
Four Weeks	38.20	54.56	29.55	20.12	21.01
Five Weeks	39.34	56.06	31.25	20.83	20.34
Six Weeks	40.80	58.27	32.40	21.85	20.42
Seven Weeks	42.88	61.64	35.97	20.65	19.27
Eight Weeks	44.88	64.32	38.32	20.77	20.58
Nine Weeks	46.85	65.90	40.70	23.74	21.89
Ten Weeks	49.01	69.23	43.62	22.57	22.69
Eleven Weeks	50.99	71.64	44.65	24.12	25.54
Twelve Weeks	52.32	76.13	43.01	23.89	23.61
Three Months	54.65	78.61	46.33	24.02	26.24
Six Months	62.30	83.00	62.22	24.24	38.48
Nine Months	64.33	83.03	75.90	19.28	33.62
One Year	59.48	77.15	68.60	15.10	36.21

*The mean rate of return is the percentage market price change from the offering price to the price at time periods of one week, two weeks, three weeks..... one year. The rates are not annualized but merely the percentage change in price after offering for the sample or stratified samples.

secondary offerings (15.5%), whereas one year after the offering date initial primary offerings' mean rate of return (77.2%) was only 2.1 times greater than the mean rate of return on initial secondary offerings (32.2%).

Thus, the relative differential in mean returns between primary offerings and the sample, mainly primary, and secondary offerings became smaller the longer the period of time initial offerings were outstanding. However, the relative mean return differential between initial primary offerings and initial mainly secondary offerings became larger as time passed. This is due to the fact that initial mainly secondary offerings showed little or no market price increase as the length of time they were outstanding in the market increased.

It appears that as the length of time an initial offering is outstanding increases the mean rates of return on the different types of distributions move closer together. In fact, in the case of initial mainly primary offerings this movement was great enough so that in the long run the mean return differential with initial primary offerings was not large enough to be statistically significant at .05 confidence level.

In both the short and long run the mean rates of return on initial primary offerings significantly

outperformed the mean rates of return on initial secondary and mainly secondary offerings in all sixteen time periods (see Appendix C, Table C-1, for a week by week breakdown of the t-tests). Initial primary offerings' mean rates of return significantly outperformed the mean rates of return on initial mainly primary offerings in the short run.

However, in the long run (six months, nine months, and one year), although the mean rates of return for initial primary offerings have been above that of the mean rates of return for the initial mainly primary offerings, these occurrences could be attributed to chance and have not been great enough to lead to the statistical premise that primary offerings outperformed mainly primary offerings at a level of confidence of .05 (see Appendix C).

Thus, in all cases except in the relationship between primary and mainly primary offerings in the long run the mean rates of return of initial primary offerings have been significantly greater than other types of distributions' mean rates of return.

The risk, when measured by coefficient of variation, has, in all cases and time periods, been less for initial primary offerings than initial mainly primary, mainly secondary, and secondary offerings. Table 3-7 presents a week by week breakdown of the coefficients of

TABLE 3-7

COEFFICIENT OF VARIATION

Time t	All Offerings σ_X/μ_X	Mainly Primary σ_{XP}/μ_{XP}		Mainly Secondary σ_{XMS}/μ_{XMS}		Secondary σ_{XS}/μ_{XS}
		Primary σ_{XP}/μ_{XP}	Primary σ_{XP}/μ_{XP}	Secondary σ_{XMS}/μ_{XMS}	Secondary σ_{XMS}/μ_{XMS}	
One Week	0.0722	0.0941	0.1175	0.1498	0.1498	0.3195
Two Weeks	0.0715	0.0919	0.1273	0.1676	0.1676	0.2900
Three Weeks	0.0771	0.0968	0.1388	0.2305	0.2305	0.3379
Four Weeks	0.0784	0.0979	0.1455	0.2245	0.2245	0.3292
Five Weeks	0.0794	0.0976	0.1485	0.2265	0.2265	0.3808
Six Weeks	0.0796	0.0983	0.1488	0.2025	0.2025	0.3988
Seven Weeks	0.0782	0.0965	0.1482	0.2148	0.2148	0.3649
Eight Weeks	0.0794	0.0990	0.1438	0.2418	0.2418	0.3477
Nine Weeks	0.0793	0.1012	0.1365	0.2464	0.2464	0.3414
Ten Weeks	0.0813	0.1042	0.1429	0.2515	0.2515	0.3143
Eleven Weeks	0.0843	0.1110	0.1441	0.2215	0.2215	0.3126
Twelve Weeks	0.0872	0.1131	0.1463	0.2386	0.2386	0.3151
Three Months	0.0853	0.1107	0.1454	0.2466	0.2466	0.3011
Six Months	0.0860	0.1098	0.1727	0.3044	0.3044	0.2488
Nine Months	0.1035	0.1342	0.1980	0.4296	0.4296	0.2366
One Year	0.1335	0.1751	0.2661	0.5786	0.5786	0.2197

variation for the initial offerings sample, primary, mainly primary, mainly secondary, and secondary offerings. Finally, when the probability of decline was used as the measure of risk, almost all cases showed a lower percentage of decline in initial primary offerings relative to the percentage of initial mainly primary, mainly secondary, or secondary offerings that declined. Table 3-8 shows a week by week breakdown of the probabilities of decline for the initial offerings sample, primary, mainly primary, mainly secondary, and secondary offerings.

Table 3-8, also, shows that the difference in the probability of decline between the various types of distributions became smaller the longer initial offerings were outstanding. For example, the probability of decline in the first week for initial primary offerings (19.3%) was much smaller than the probability of decline for initial secondary offerings (32.7%); whereas one year after the offering date the probability of decline for initial primary offerings (42.0%) was slightly greater than the probability of decline for initial secondary offerings (34.0%). In other words, as time passed, the probability of decline for the four types of distributions moved from being extremely unequal in the short run to approximately equal in the long run.

TABLE 3-8

PROBABILITY OF DECLINE*

Time	All Offerings P (X)	Primary P (XP)	Mainly		Secondary	
			Primary P (XMP)	Secondary P (XMS)	Primary P (XP)	Secondary P (XS)
One Week	23.75%	19.34%	22.77%	26.15%	37.74%	37.74%
Two Weeks	27.50	22.65	27.72	27.69	43.40	43.40
Three Weeks	27.75	22.65	27.72	32.31	39.62	39.62
Four Weeks	28.50	20.99	34.65	32.31	37.74	37.74
Five Weeks	29.00	24.86	30.69	32.31	35.84	35.84
Six Weeks	29.50	25.97	28.71	27.69	45.28	45.28
Seven Weeks	28.50	25.97	26.73	26.15	43.40	43.40
Eight Weeks	29.25	25.97	27.72	33.85	37.74	37.74
Nine Weeks	27.50	23.76	23.76	30.77	43.40	43.40
Ten Weeks	28.00	24.31	24.75	33.85	30.62	30.62
Eleven Weeks	28.50	25.97	24.75	33.85	37.74	37.74
Twelve Weeks	27.75	23.76	23.76	35.38	39.62	39.62
Three Months	28.00	23.76	25.74	32.31	41.51	41.51
Six Months	31.75	27.07	32.67	38.46	37.74	37.74
Nine Months	37.50	35.36	36.63	44.62	37.74	37.74
One Year	41.75	41.99	40.59	49.23	33.96	33.96

*Number of offerings whose market price at time periods, one week, two weeks, three weeks up to one year, was below the offering price dividend by the number of offerings in the sample (stratified samples).

In those cases where the percentage of decline on initial primary offerings had been above that of the percentage of decline in mainly primary, mainly secondary, and secondary offerings, a Z-test showed that the percentage differential could have been attributed to chance and was not statistically significant at a .05 level of confidence (see Appendix D for Z-tests of distributions that had a smaller percentage decline ratio than initial primary offerings).

In conclusion it seems that initial primary offerings have been a better investment than initial mainly primary offerings in the short run, and than mainly secondary and secondary offerings in both the short and long run. In other words, the variations in return between the types of initial offering distributions can not be explained by differentials in risk. These conclusions tend to support the idea that underwriters suppress the offering price and/or push in the after-market those offerings they have greatest financial interest.¹ Finally, the longer the time initial offerings were outstanding the less the differential in investment worthiness became between the various types of distributions.

¹See Appendix A, Table A-2, for the percentage of warrants held by underwriters in the various types of distributions.

Limiting Factors of the Study

Anyone wishing to apply the results of this study should be familiar with the limiting assumptions applied to the analysis. These limiting assumptions are:

(1) A major limitation of most historical studies of securities markets is that past observations may not necessarily lead to valid generalizations about future results. This limitation has been partially overcome by basing observations on a reasonably long period which included two major bear markets (1966 and 1969) as well as two strong bull markets (1966 first half and 1968). Also, the most recent time period possible (to June 30, 1970) was included in the study.

(2) The assumption of how long initial offerings would be held, i.e., one week, two weeks,...etc., was arbitrarily established. These durations were used in order to make return and risk calculations for time periods when new influences on the issue presumably had not yet reached the market.

(3) Security analysis has been ignored in the selection of initial offerings. Real world results could be improved or worsened depending on the skill of the investor.

(4) The study does not take into account the

brokerage fees on the selling of initial offerings. There are no brokerage fees on the purchase of initial offerings. Also, taxes were excluded. Returns for the entire study would be lower if these two additional expenses were considered.

(5) Cash dividends paid by the firms were also not considered. This would lead to only a slight bias in returns towards initial offerings, since these companies rarely pay cash dividends, while the Over-the-Counter Average's stocks almost all pay cash dividends.

(6) The large sample included in this study assumes one could have purchased a large diversified portfolio of initial offerings at all times. This would be impossible for most investors.

(7) The use of coefficient of variation as a measurement of risk has its limitation. Perhaps the most objectionable feature is that investors are not interested in the total distributions of expected returns, but rather in the probability of certain types of adverse returns. Thus, a second measure of risk was employed. The second measure of risk was probability of decline. This measurement of risk calculates a condition all investors in initial offerings would be attempting to avoid.

(8) The calculation of the risk premium rate of

return given by investment bankers to investors in initial offerings might be questioned. The spread between initial offerings' price earnings ratio and the OTC Average's price/earnings ratio was used to set both groups at an equal starting point and then test if the two groups' market price movements were equal. The high rates of return on initial offerings would indicate that until a risk premium of 38 per cent had been used, initial common stock offerings would have outperformed the OTC Average.

(9) Finally, the question of new security laws may immediately nullify any conclusion that might be drawn from the past. The study assumes initial offerings will continue to be offered by underwriters in the future as they have been in the past.

CHAPTER 4

SUMMARY AND CONTRIBUTIONS

Summary

Purpose of the Study. Two objectives motivated the study of initial common stock offerings and their market price behavior. These two objectives are: first, to determine how initial common stock offerings have performed in the past, and second, to determine if capital market institutions have been able or willing to bring initial offerings to the market in equilibrium with the over-the-counter market. In order to evaluate these two questions accurately the fact that initial offerings are not exactly homogeneous needs to be taken into account. Thus, it is pertinent to stratify initial offerings according to who is receiving the proceeds from the sale of the offering, the company and/or selling stockholders. Another aspect of this study has been to determine if variations in market rates of return on the various types of initial offering distributions can be explained by differentials in risk. The three basic types of initial offering distributions

are: primary, secondary, and mixture.

A random sample of 400 initial common stock offerings was drawn. The total period covered by the study extended from January 19, 1965 (when the first initial offering was selected) to June 30, 1970 (a year after the last initial offering was selected). The market returns and risks associated with these 400 issues were analyzed for sixteen time periods, ranging from one week to one year after the offering date.

Findings, Implications, and Recommendations. The results of this study lead to the following findings, implications, and recommendations:

(1) Initial common stock offerings have shown higher than normal market rates of return. The mean rates of return on initial offerings ranged from a low of 32.43 per cent within the first week after the offering date, to a high of 62.33 per cent nine months after the offering date. During this same time period, the OTC Average's mean rates of return were only 0.14 and 6.08 per cent respectively. The risk, as measured by coefficient of variation and probability of decline, associated with the OTC Average was greater than the risk associated with the sample of initial offerings. Thus, initial offerings have had greater market rates of return and less risk associated

with them than the OTC Average.

(2) Initial common stock offerings' market performance has been in disequilibrium with the performance of the OTC Average. The market rates of return on initial offerings, even after a risk adjustment of 13.2 per cent for the shifting of capital, showed superior performances in relation to the OTC Average in both the short and long run. On average, initial offerings market price appreciation, even after the 13.2 per cent risk adjustment, was 25 per cent greater than the price appreciation of the OTC Average.

(3) The extreme disequilibrium between the OTC Average and initial offerings strongly indicates that investors in initial offerings have been receiving economic rent. The preferred investors, those who have been able to obtain initial offerings, have been given a gift by the investment banking world.

(4) All the above leads to the conclusion that: Underwriters have been unable or unwilling to set a realistic offering price on initial offerings.

(5) The returns on initial offerings increased as the time they were outstanding increased. The market rate of return on initial offerings one year after the offering date (59.4%) was higher than that at any point

(at week intervals) within the first three months. This implies that the market price appreciation on initial offerings has not been merely a short run phenomenon as many researchers have implied.

(6) Initial primary common stock offerings have proved to be a better investment than the OTC Average, initial mainly primary, initial mainly secondary, and secondary offerings. They have offered both higher market rates of return and have had less risk, as measured by relative variability and probability of decline, associated with them than the OTC Average and the other three types of distributions. That is, the variations in return between types of initial offering distributions could not be explained by differentials in risk. This, also, applied to initial primary offerings and the OTC Average.

(7) Thus, underwriters have under priced and/or pushed in the after-market those initial offerings in which they held greatest financial interest. Underwriters held warrants in 78.1 per cent of the initial primary offerings floated in 1968; whereas they held warrants in only 45.0 per cent of the initial mainly primary offerings, 30.8 per cent of the initial mainly secondary offerings, and 16.7 per cent of the secondary offerings floated in 1968.

(8) The above findings lead to two recommendations for change in the investment banking world.

(1) The first change needed is in the method of compensating underwriters. Contingent fees result in a conflict of interest and should be disallowed.

(2) The second change needed is in the present method of determining the offering price. A solution may be to compensate an underwriter or some other independent person or firm for drawing up the red herring. Then have underwriters bid on all or any portion of the offering in the same manner treasury bills are sold.

Contributions of the Study

This research effort should fill a gap in the investment literature on initial common stock offerings. Little research has been done on this group of offerings to date.

Secondly, it provides a guide to risk and return possibilities encountered in initial offering investing. This examination may aid investors interested in the initial offerings' market determine optimal strategies of buying and selling such offerings. It could also serve to demonstrate to the securities authorities that many inequities have existed in the initial offerings' market.

APPENDIX A

TOTAL NEW COMMON STOCK OFFERINGS

&

PERCENTAGE OF WARRANTS HELD BY UNDERWRITERS

TABLE A-1

TOTAL NEW COMMON STOCK OFFERINGS
(In million of dollars)

Year	Corporate Common Stock (cash offerings)
1962	1,314
1963	1,011
1964	2,679
1965	1,547
1966	1,939
1967	1,959
1968	3,946
1969	7,714

Source: Federal Reserve Bulletin, May
1970, Number 5, Volume 56.

TABLE A-2

PERCENTAGE OF WARRANTS HELD BY UNDERWRITERS

Type of Offering	Total Number	# Included* Warrants	Percentage** of Warrants
Primary	32	25	78.1%
Mainly Primary	20	9	45.0
Mainly Secondary	13	4	30.8
Secondary	<u>12</u>	<u>2</u>	<u>16.7</u>
Total	77	40	51.9%

*Number of offerings that the underwriter held warrants or stock in the firm.

**Percentage of offerings that the underwriter held warrants or stock in the firm.

APPENDIX B

INITIAL COMMON STOCK OFFERINGS SAMPLE

TABLE B-1

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
1	Essex Wire Corporation	011965
2	George A. Philbrick Researchers	012765
3	Weis Markets, Inc.	020265
4	ConChemCo, Inc.	020365
5	Memorex Corp.	030365
6	Betz Laboratories, Inc.	030365
7	Fleetwood Enterprises, Inc.	030465
8	DPA, Inc.	031065
9	Skaggs Pay Less Drug Stores	032365
10	Fisher Scientific Co.	032365
11	Martha White Mills, Inc.	033065
12	Coffee-Mat Corp.	040665
13	McDonald's Corp.	042165
14	Denver Chemical Mfg. Co.	042865
15	Southeastern Drilling Inc.	051165
16	Aberdeen Manufacturing Corp.	051265
17	Roos/atkins	051865
18	House of Fabrics	052065
19	Susan Thomas, Inc.	052765
20	Grant Advertising International, Inc.	052765
21	Spencer Packing Co.	061065
22	Star Supermarkets, Inc.	061565
23	Henredon Furniture Industries, Inc.	061765
24	Twenty Grand Marine Service	070765
25	Kearney-National Inc.	081165
26	University Computing Co.	090965
27	Eagle Clothes, Inc.	091365
28	Grey Advertising Inc.	092165
29	C. H. Masland & Sons	092165
30	Stern Metals Corp.	092365
31	Ameco, Inc.	100665
32	General Electrodynamics Corp.	100765
33	Charles Pindych Inc.	100865
34	Applebaums' Food Markets, Inc.	101365
35	Chemical Leaman Tank Lines, Inc.	101365
36	Palm Beach Co.	102665
37	Fairfield-Noble Corp.	102765
38	Home Security Life Insurance Co.	110465
39	Baltimore Business Forms, Inc.	111665
40	Villager, Inc.	111665

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TABLE B-2

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
41	Automatic Sprinkler Corp. of America	111765
42	Mercury Chemical Corp.	122165
43	Zions Utah Bancorporation	011266
44	Eagle General Corp.	011766
45	Goya Music Corp.	012066
46	Enstrom (R. J.) Corp.	020166
47	Inflight Motion Pictures, Inc.	021766
48	Wilson Freight Co.	022366
49	Diversified Metals Corp.	030266
50	Sales Follow-Up Corp.	030466
51	Systems Engineerings Laboratories	031666
52	Kentucky Friend Chicken Corp.	031766
53	Morton's Shoe Stores Inc.	032466
54	LIN Broadcasting Corp.	032466
55	Industrial Electronics Associates, Inc.	040466
56	Maryland TeleCommunications, Inc.	040566
57	Burris Chemical Corp.	040566
58	Tolin Manufacturing Corp.	040566
59	Drilco Oil Tools, Inc.	041166
60	Ogilivly & Mather International Inc.	042666
61	Harvest Markets, Inc.	042866
62	Pat Fashions Industries, Inc.	042966
63	Informatics, Inc.	051066
64	Fine Organics, Inc.	051266
65	Fred Harvey	051866
66	Superscore, Inc.	052366
67	Sun Electric Corp.	060166
68	Jamesway Corp.	061466
69	Tridair Industries	061666
70	Methode Electronic, Inc.	061766
71	Barbara Lynn Stores, Inc.	062166
72	Okonite Co.	062266
73	Riker Video Industries	062266
74	Airstream Inc.	070166
75	Cole Drug Co., Inc.	070666
76	Wean Industries, Inc.	071866
77	Sperti Drug Co.	071966
78	Space Ordinance Systems, Inc.	080366
79	Acushnet Process Co.	081066
80	Buckbee-Mears Co.	092766

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TABLE B-3

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
81	Alpha Industries, Inc.	102766
82	Spring Mills, Inc.	102766
83	Huffman Manufacturing Co.	111566
84	Mohawk Data Sciences Corp.	111566
85	Elcor Chemical Corp.	120666
86	Penn Engineering & Manufacturing Co.	120666
87	Air California	121566
88	Gilford Instrument Laboratories Inc.	010367
89	Micronetic Corp.	011167
90	Allen Aircraft Radio	020967
91	Farah Manufacturing Co., Inc.	021567
92	Gulf Aerospace Corp.	022067
93	Duplex Products, Inc.	022167
94	Key Pharmaceuticals Inc.	022767
95	Dynell Electronics Inc.	030267
96	Seven-Up Co.	031567
97	Met-Pro Water Treatment Corp.	032267
98	Sanders & Thomas, Inc.	032367
99	Eberline Instrument Corp.	032967
100	Champion Products Inc.	040567
101	Datatab Inc.	040667
102	Milton Roy Co.	041867
103	Motor Club of America	042067
104	Summers Electric Co.	042067
105	WTC Airfreight	042767
106	AITs, Inc.	050367
107	American Institutional Developers, Inc.	050367
108	Houghton-Mifflin Co.	050367
109	Sonderling Broadcasting Corp.	050467
110	Information Displays, Inc.	052767
111	Semtech Corp.	060667
112	Sheffield Watch Corp.	062767
113	Overseas National Airways	062867
114	Administrative Systems, Inc.	062967
115	Corinthian Broadcasting Corp.	070667
116	Saunders Leasing Systems, Inc.	071167
117	Patterson-Smith, Inc.	071767
118	Discon Corp.	071967
119	Grove Press, Inc.	072567
120	Quality Mills, Inc.	080167

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TABLE B-4

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
121	Optics Technology, Inc.	081067
122	Old Fort Industries, Inc.	081567
123	Wang Laboratories, Inc.	082367
124	Computest Corp.	082467
125	Domestic Air Express, Inc.	082967
126	National Computer Analysts, Inc.	082967
127	Applied Magnetics Corp.	083167
128	Damon Creation, Inc.	090667
129	Real Eight Co., Inc.	091167
130	Graphic Sciences, Inc.	091267
131	Air Industries Corp.	091367
132	Pacific Electricord Corp.	100367
133	Platronics, Inc.	101767
134	Jet Air Freight	101767
135	Electronic Modules Corp.	110267
136	Adams Dana Silversteine, Inc.	110667
138	Marinduque Mining & Industrial Corp.	110967
139	Burns & Towne, Inc.	111567
140	Hudson Leasing Corp.	112167
141	Spectral Dynamics Corp. of San Diego	112867
142	Hamco Machine & Electronics Corp.	112967
143	Noland Co.	113067
144	White Electromagnetic Inc.	120667
145	Chamberlain Manufacturing Corp.	120767
146	Adams-Russell Co., Inc.	121467
147	General Reed Co.	121467
148	Pacific & Southern Broadcasting Co.	122867
149	Childhood Productions	010268
150	Software Systems, Inc.	010668
151	Flight Safety, Inc.	011768
152	Chronetics, Inc.	012368
153	United Convalescent Hospitals	012568
154	Widmann (L. F.) Inc.	021368
155	Yuletide Enterprises, Inc.	021468
156	Juness Industries Inc.	021468
157	Leasing Consultants, Inc.	022968
158	Transmation, Inc.	022968
159	Gay Gibson, Inc.	030568
160	Basic Leasing Corp.	030668

TABLE B-5

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
161	Skymark Airlines, Inc.	030668
162	Davis Food Service, Inc.	030768
163	Information International, Inc.	030768
164	Telecom, Inc.	032568
165	C. G. S. Scientific Corp.	032768
166	Brennand-Paige Industries, Inc.	032868
167	Ad/Mar Computer Techniques Corp.	040168
168	M. P. C., Inc.	040468
169	Computer Investors Group, Inc.	041068
170	Rex Plastics, Inc.	041668
171	Private and Computer Schools, Inc.	041768
172	Barnes Corp.	041768
173	David Crystal, Inc.	041868
174	Curtline of America, Inc.	042468
175	L. S. Ayres & Co.	042568
176	Computer Servicenters, Inc.	042668
177	Hydro-Ski International Corp.	042968
178	Omni Spectra, Inc.	043068
179	LeGran Corp.	043068
180	Minnie Pearl's Chicken System, Inc.	050168
181	Save-Way Barber & Beauty Supplies	050168
182	Superior Surgical Mfg. Co., Inc.	050268
183	Sun-Glo Products Corp.	050968
184	Four Season Nursing Centers of Am.	051068
185	United Dollar Stores, Inc.	051468
186	Griffiths Electronics, Inc.	051668
187	Integrated Container Services	051668
188	Computer devices Corp.	052468
189	Samuel Moore & Co.	052868
190	U. N. Alloy Steel Corp.	060668
191	Automation Sciences, Inc.	061168
192	Docktor Pet Center, Inc.	061168
193	Everest & Jennings International	061168
194	Rollins Leasing Corp.	061168
195	Rite Aid Corp.	061368
196	Phelan Sulphur Co.	061368
197	Michael Baker, Jr., Inc.	061468
198	Mr. Swiss of America, Inc.	061768
199	Plain 'n' Fancy Donuts of America	061868
200	Intermediate Nursing Centers, Inc.	062068

TABLE B-6

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
201	Ideal Toy Corp.	062768
202	National Liberty Corp.	070268
203	Hesston Corp.	070268
204	Electron-Machine Corp.	070368
205	Educasting Systems, Inc.	070868
206	Levitz Furniture Corp.	070968
207	Daniel Industries, Inc.	071168
208	Bonanza International, Inc.	071168
209	Data Systems Analysts, Inc.	071268
210	U. S. Time-Sharing, Inc.	071868
211	Viking Industries, Inc.	071968
212	Camel Manufacturing Co.	072568
213	Valle's Steak House	072968
214	E. C. Ernest, Inc.	073168
215	Food Industries, Inc.	080168
216	URS Systems Corp.	080168
217	Dialscan Systems, Inc.	080568
218	AIC Photo	080668
219	Friendly Ice Cream Corp.	080668
220	E. T. Barwick Industries, Inc.	080868
221	Bowne & Co., Inc.	082068
222	Open Road Campers, Inc.	082068
223	Mary Kay, Inc.	082268
224	Bankers Utilities Corp.	082268
225	Lewton Television, Inc.	082668
226	Mobile Home Industries, Inc.	081068
227	California Health Care, Inc.	091168
228	Venice Industries, Inc.	091268
229	Purification Sciences Inc.	091268
230	Underground Surveys Corp.	091368
231	Ray Proof Corp.	091768
232	Alex Coleman, Inc.	091768
233	Cinema V Distributing, Inc.	091968
234	Kappa Frocks, Inc.	091968
235	Trend Industries, Inc.	091968
236	Veta Precision Laboratories	091968
237	Leigh Products, Inc.	091968
238	Frequency Electronics, Inc.	092068
239	Swedlow, Inc.	100368
240	Scotco Data Leasing, Inc.	100368

TABLE B-7

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
241	Scientific Pollution Control Corp.	100668
242	Tad's Enterprises, Inc.	100768
243	Qatron Corp.	100768
244	Data Network Corp.	101068
245	Connecticut Consolidated Industries	101068
246	Valmont Industries, Inc.	101068
247	Ariz-Colorado Land & Cattle Co.	101168
248	Comcet, Inc.	101568
249	Datascan, Inc.	101768
250	Base Ten Systems, Inc.	102268
251	Chuck Barris Production, Inc.	102268
252	Elder-Beerman Stores Corp.	102268
253	International Aluminum Corp.	102268
254	Monterey Nursing Inns, Inc.	102268
255	Castagna Electronics Corp.	102468
256	Speciality Restaurants Corp.	102468
257	Winn's Stores, Inc.	102968
258	Edgington Oil Co.	102968
259	Page Airways, Inc.	102968
260	Puritan-Bennett Corp.	102968
261	Roselon Industries, Inc.	111368
262	Storescope TV, Inc.	111568
263	Republic Color Inc.	111568
264	Computer Property Corp.	111968
265	Coldwell, Banker & Co.	112168
266	Burnup & Sims Inc.	112168
267	KPA Computer Techniques, Inc.	112168
268	Martha Manning Co.	112668
269	Arkansas Best Corp.	112668
270	Arcata National Corp.	120368
271	Data Architects, Inc.	120368
272	Infotec, Inc.	121068
273	Premier Photo Service, Inc.	121068
274	Alexander's Inc.	121268
275	Latham Process Corp.	121268
276	Chesapeake Industries, Inc.	121268
277	Firaco, Inc.	121268
278	S. M. Flickinger Co., Inc.	121268
279	Einson Freeman & DeTroy Corp.	121668
280	Armin Poly Film Corp.	121668

TABLE B-8

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
281	Vithabeth, Inc.	121668
282	Computer Time Shareing Corp.	121768
283	William Hodges & Co., Inc.	121768
284	Saving Financial	121768
285	Kaysam Corp. of America	121968
286	Elba Systems Corp.	121968
287	Republic Mortgage Investors	122068
288	General Analytics Corp.	122068
289	Canrad Precision Industries, Inc.	122068
290	Alberts, Inc.	122068
291	Serendipity Inc.	122768
292	Information & Computing Centers Corp.	010769
293	Jerrico, Inc.	010769
294	Abe Schrader Corp.	010969
295	Programmed Tax Systems, Inc.	011369
296	Moulding, Inc.	011469
297	Skamper Corp.	012369
298	Trans-Industries, Inc.	012469
299	Hamburger Hamlet, Inc.	012869
300	Metrecare Enterprises, Inc.	012869
301	National Hardgoods Distributors, Inc.	012969
302	Wilson Leasing Co.	012969
303	C & W Precision Products, Inc.	013069
304	International Systems Associates, Ltd.	020569
305	Acme Shear Co.	020669
306	General Health Services, Inc.	020669
307	Herman Marcus Inc.	020669
308	U. S. Systems & Software, Inc.	020769
309	Aberle Industries, Inc.	021269
310	Aldon Industries, Inc.	021369
311	Gro-Plant Industries, Inc.	021769
312	Edmos Products Corp.	021869
313	Snelling & Snelling, Inc.	021969
314	StangHydronics, Inc.	021969
315	Technical Publishing Co.	021969
316	American Medical Building Guild, Inc.	022469
317	Electrone, Inc.	022469
318	Products Applications, Inc.	022569
319	Cut & Curl, Inc.	022669
320	Oslas Organization, Inc.	012969

TABLE B-9

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
321	Peter Eckrich & Sons, Inc.	022669
322	Continental Testing Labs., Inc.	022769
323	Leisure Technology Corp.	022769
324	Mangurian's, Inc.	022769
325	Plessey Inc.	022769
326	Four Seasons Equity Corp.	022869
327	National Packaging Corp.	022869
328	Guardian Mortgage Investors	030469
329	Al Hirt's Sandwich Saloons, Inc.	030469
330	Mark Computer Systems, Inc.	030469
331	Netgo, Ltd.	030469
332	Mason Personnel Associates, Inc.	031069
333	Analog Devices, Inc.	031169
334	National Institute for Better Reading	031269
335	Viatron Computer Systems Corp.	031269
336	Inter-Island Mortgage Corp.	031269
337	Seattle Supersonics Corp.	031369
338	Bally Manufacturing Corp.	031769
339	Princeton Electronic Products, Inc.	031869
340	Sorg Printing Co.	031869
341	South Shore Publishing Co., Inc.	031869
342	Datatron Inc.	031969
343	Radiation Technology, Inc.	032169
344	Lovle Products, Inc.	032569
345	Continental Care Centers, Inc.	032769
346	Kit Manufacturing Co.	032769
347	Paramount Leasing Corp.	032769
348	Ram-Hart Systems, Inc.	032769
349	Graham Magnetics, Inc.	032769
350	GSI Computer Inc.	040169
351	Hipotronics, Inc.	040169
352	Mica Products Corp.	040169
353	Management Services, Inc.	040369
354	Voila Foods for Pets, Inc.	040769
355	Class Student Services, Inc.	040969
356	McDonough Co.	040969
357	Computer Circuits Corp.	041069
358	Baumritter Corp.	041569
359	Wynn Oil Co.	041569
360	Convalariums of America, Inc.	041669

TABLE B-10

INITIAL COMMON STOCK OFFERINGS SAMPLE

Number	Stock	Offering Date
361	Pier 1 Imports, Inc.	041769
362	Malaker Corp.	042169
363	Computer College of Technology, Inc.	042169
364	Knight Newspapers, Inc.	042269
365	Pamida, Inc.	042269
366	Grimm & Davis, Inc.	042369
367	Moore's Seafood Products, Inc.	042369
368	Continental Hosts, Ltd.	043069
369	Fotomat Corp.	043069
370	Hampton Shirt Co., Inc.	050169
371	AAA Enterprises, Inc.	050269
372	Mr. Swiss of the East, Inc.	050269
373	U.S. Hydrofoils-Lehigh Distribution	050269
374	LaSalle-Deitch Co., Inc.	050669
375	Information Machines Corp.	050769
376	The Newhall Land & Farm Co.	050869
377	Parkwood Homes, Inc.	050869
378	Anametrics, Inc.	050969
379	Hills Brothers, Inc.	051269
380	Atlantic Industries, Inc.	051369
381	Pulse Communication, Inc.	051369
382	Sierra Research Corp.	051469
383	Monica Simone Cosmetics, Inc.	051569
384	American Biomedical Corp.	052269
385	Computer Image Corp.	052769
386	Floyd Enterprises, Inc.	052769
387	Olshen Overseas Inc.	060369
388	TeleGeneral Corp.	060369
389	Hickory Furniture Co.	060469
390	Riverside Press, Inc.	060469
391	Pathfinder Mobile Homes, Inc.	060569
392	Cogar Corp.	061669
393	Presidents-First Lady Spa. Inc.	061769
394	Oak Cliff Saving & Loan Association	061769
395	National Data Processing Corporation	061869
396	Condominiums Northwest	061869
397	Starr Broadcasting Group	061869
398	Kampgrounds of America	062469
399	Ordinance Engineering Associates	062469
400	Mathematical Applications Group, Inc.	063069

APPENDIX C

TYPES OF DISTRIBUTION

t-TEST OF EQUALITY OF MEANS

1

TABLE C-1

TYPES OF DISTRIBUTION
t - Test of Equality of Means

Time	Mainly Primary		Mainly Secondary	Secondary
	H_0	$\mu_{P_t} \leq \mu_{MP}$	$\mu_{P_t} \leq \mu_{MS}$	$\mu_{P_t} \leq \mu_S$
	H_1	$\mu_{P_t} > \mu_{MP}$	$\mu_{P_t} > \mu_{MS}$	$\mu_{P_t} > \mu_S$
		t_v	t_v	t_v^*
One Week		3.872	5.337	4.658
Two Weeks		3.940	5.041	4.891
Three Weeks		3.407	4.565	4.142
Four Weeks		3.648	4.926	3.955
Five Weeks		3.461	4.876	3.767
Six Weeks		3.454	5.031	3.802
Seven Weeks		3.214	5.527	4.601
Eight Weeks		3.088	5.373	4.568
Nine Weeks		2.904	4.746	4.394
Ten Weeks		2.685	5.082	4.588
Eleven Weeks		2.633	4.949	4.089
Twelve Weeks		3.106	5.060	4.617
Three Months		2.933	3.096	4.455
Six Months		1.475**	5.011	3.367
Nine Months		0.382**	4.593	3.610
One Year		0.381**	3.856	2.611

*The critical region is assumed to be 1.653 or greater. The degrees of freedom varied from 106 to 278. If t_v is greater than 1.653 the null hypothesis (H_0) is rejected and the alternative hypothesis is accepted. If t_v is less than 1.653 the null hypothesis is accepted and the differences in the mean rates of return could possibly be attributed to chance.

**Accept the null hypothesis. In all other cases and periods reject the null hypothesis.

APPENDIX D

TYPES OF DISTRIBUTION

Z-TESTS OF PROBABILITY OF DECLINE

11

TABLE D-1

PROBABILITY OF DECLINE
(Z-TESTS)

$H_0: P(XP) > P(XMP)$				$H_1: P(XP) \leq P(XMP)$	
Time	Probability of Decline			σ_{P+MP}	OD/ σ^*
	Primary XP	Mainly Primary XMP	Difference OD		
Eleven Weeks	0.2597	0.2475	0.0122	0.0540	0.2258
One Year	0.4199	0.4059	0.0140	0.0613	0.2283
$H_0: P(XP) \leq P(XMS)$				$H_1: P(XP) > P(XMS)$	
Time	Probability of Decline			σ_{P+MS}	OD/ σ
	Primary XP	Mainly Secondary XMS	Difference OD		
One Week	0.2375	0.2277	0.0098	0.0525	0.1865
Three Weeks	0.2775	0.2772	0.0003	0.0557	0.0054
Six Weeks	0.2950	0.2871	0.0079	0.0565	0.1399
Seven Weeks	0.2850	0.2673	0.0177	0.0556	0.3185
Eight Weeks	0.2925	0.2772	0.0153	0.0560	0.2730
Nine Weeks	0.2750	0.2376	0.0374	0.0539	0.6934
Ten Weeks	0.2800	0.2475	0.0325	0.0545	0.5964
Eleven Weeks	0.2850	0.2475	0.0375	0.0546	0.6869
Twelve Weeks	0.2775	0.2376	0.0399	0.0545	0.7322
Three Months	0.2800	0.2574	0.0226	0.0545	0.4147
Nine Months	0.3750	0.3663	0.0087	0.0601	0.1448
One Year	0.4175	0.4059	0.0116	0.0612	0.1894
$H_0: P(XP) \leq P(XS)$				$H_1: P(XP) > P(XS)$	
Time	Probability of Decline			σ_{P+S}	OD/ σ
	Primary XP	Secondary XS	Difference OD		
One Year	0.4175	0.3396	0.0779	0.0598	1.3020

*If OD/ σ is less than 1.645 the null hypothesis is rejected and the alternative hypothesis is accepted. In other words, differences in the probability of decline are assumed to be due to chance and not significantly different. The null hypothesis is rejected in all cases.

APPENDIX E

RISK PREMIUM RATE OF RETURN

TABLE E-1

PRICE/EARNINGS RATIOS --- NATIONAL QUOTATION BUREAU OVER-THE-COUNTER INDUSTRIAL AVERAGE

Company	Price/Earnings Ratio			
	1969	1968	1967	1966
Acme Visible	21.3	30.9	26.4	41.2
Allyn & Bacon	33.3	30.0	29.1	22.9
American Express	23.3	25.7	29.7	19.8
American Greetings	20.4	22.8	23.3	15.9
Anheuser-Busch	32.9	27.7	22.8	16.6
Arrow Hart	19.0	21.4	21.5	18.7
Barnes Hind	33.3	31.0	28.8	27.0
Berkshire Hathaway	8.6	8.6	17.9	8.1
Brockway Glass	13.0	16.0	19.5	16.5
Brush Beryllium	18.7	25.6	26.2	12.5
Buckbee Mears Co.	28.9	25.2	17.2	16.0
Cannon Mills	9.4	8.5	11.4	9.5
Computer Usage Co.	12.7	66.6	54.4	34.4

TABLE E-2

PRICE/EARNINGS RATIOS -- NATIONAL QUOTATION BUREAU OVER-THE-COUNTER INDUSTRIAL AVERAGE

Company	Price/Earnings Ratio			
	1969	1968	1967	1966
Economics Laboratory	41.5	34.0	26.2	20.0
Hexcel Corp.	43.4	49.0	25.7	12.9
Hoover Co.	11.7	12.3	9.9	7.8
Hyster Co.	10.8	10.8	13.9	9.9
Inland Container	11.5	11.1	9.9	10.1
Kaiser Steel	19.1	12.4	6.8	6.4
Kearney & Trecker	29.1	21.8	18.8	10.2
Eli Lilly Co.	32.2	28.5	31.5	26.8
Magnetics Inc.	27.9	24.0	24.3	16.3
Mallinckrodt Chemical Works "A"	21.4	20.9	20.9	18.4
Midas International	30.1	20.8	17.3	8.5
Nicholson File	12.0	24.2	11.4	8.0
A. C. Nielsen "B"	25.4	29.5	29.2	25.4

TABLE E-3

PRICE/EARNINGS -- NATIONAL QUOTATION BUREAU OVER-THE-COUNTER INDUSTRIAL AVERAGE

Company	Price/Earnings Ratio			
	1969	1968	1967	1966
Noxell Corp.	26.9	23.7	18.5	10.8
Raychem	84.0	86.0	85.0	77.8
O. M. Scott	24.5	14.8	14.4	13.3
Tampax Inc.	37.0	34.0	27.7	32.7
Tidewater Marine Service	22.0	23.5	17.0	8.5
Tecumseh Products	16.1	16.0	10.2	8.4
Trico Products	8.9	11.3	13.0	12.3
U. S. Envelope	13.0	22.8	7.9	6.9
U. S. Financial Corp.	<u>25.9</u>	<u>34.9</u>	<u>5.6</u>	<u>17.7</u>
Total	849.2	906.3	773.3	628.2
Average P/E (Yearly)	24.3	25.9	22.0	17.9

TABLE E-4

RISK PREMIUM RATE OF RETURN (θ)

Year	Average P/E (1)	Percentage Initial Offerings In Sample (2)	Weighted Average (3)
1965	18.3	8.6%	1.55
1966	17.9	8.8	1.58
1967	22.0	12.2	2.68
1968	25.9	28.6	7.43
1969	24.3	41.8	<u>10.16</u>
PEN*			23.40
PEI**			20.67
PEN - PEI			2.73
$\theta = (PEN - PEI)/PEI$			<u>13.20%</u>

*Weighted average price/earnings ratio of the OTC Average for the years 1965 to 1969. Weighted according to the number of initial offerings in the study's sample in each year respectively.

**Average price/earnings ratio of all initial offerings that had positive earnings for the three years prior to its offering date. There were 288 initial offerings that had positive earnings for three consecutive years prior to their offering date.

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