The Anomalous Stock Market Behavior of Large Firms in January: The Evidence from the S&P Composite and Component Indexes

Theodor Kohers
Mississippi State University

Raj K. Kohli
Indiana University at South Bend

Abstract

Previous studies have shown that the mean monthly return for January is significantly different from returns during other months of the year. More recently, several researchers have suggested that the higher January returns accrue disproportionately to small firms, especially during the early days of January. Concentrating on the S&P composite index, which consists of large firm securities, the results of this study show that, with few exceptions, the mean monthly returns for January are the highest, while the variations per unit of return are the lowest as compared to the returns in any other month of the year. Therefore, this paper provides evidence that the so-called January effect is independent of the small firm effect.

Introduction

Widely differing opinions on the degree of market efficiency continue to make the efficient market hypothesis (EMH) one of the more controversial issues in finance. An efficient market usually is defined as one where all known and relevant information about a security is reflected accurately in its current price. New information, as it becomes available, is impounded instantly into the security's price. In markets where these characteristics prevail, it would be impossible for an investor to earn consistently superior investment returns.

In the past, academic scholars almost universally have supported most of the three forms of the EMH (see, for example, Boldt and Arbit, 1984; Lease and Lewellen, 1982), while professional money managers and institutional investors always have expressed some doubt. More recently, though, several studies have suggested that financial markets may not be as efficient as is believed by many academicians (for example, see Jensen, 1978; Rosenberg, Reid, and Lanstein, 1985). These studies identify anomalies that indicate that variables other than risk were responsible for the returns on different stock investments over time. In other words, some investments appear to generate abnormal returns. The better known anomalies include the following:

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- The small firm effect (Banz, 1981; Brown, Kleidon, and Marsh, 1983; Keim, 1983; McDonald and Miller, 1989; Reinganum, 1981, 1983; and Stoll and Whaley, 1983);

- Low price-earnings ratios (Basu, 1977; Goodman and Peavy, 1985; and Rendleman, Jones, and Latane, 1985);

- The weekend effect (Aggarwal and Rivoli, 1989; Flannery and Protopapadakis, 1988; French, 1980; Gibbons and Hess, 1981; Gultekin and Gultekin, 1983; Harris, 1986; Jaffe and Westerfield, 1985); and

- The January or the year-end effect (Brown, Keim, Kleidon, and Marsh, 1983; Officer, 1975; Pettengill, 1985; Rogalski and Tinic, 1985; Rozeff and Kinney, 1976; and Smirlock and Starks, 1986).

This paper tests for the existence of the January effect in stock indexes representing large firms. According to the January effect, in general, the mean monthly return for January is significantly different from the mean monthly returns during other months of the year. Recently, several researchers have documented that the higher January returns accrue disproportionately to small firms, especially during the early days of January (Keim, 1983; Reinganum, 1983). This paper contributes to the existing body of knowledge on the topic by providing a comprehensive examination of the January effect for the Standard & Poor's indexes representing large firms and by reviewing the consistency of monthly returns across different time intervals. More specifically, in an attempt to provide evidence suggesting that this seasonal anomaly is independent of the small firm effect, returns on the S&P indexes (i.e., the S&P composite, the S&P industrials, the S&P transportation, the S&P utilities, and the S&P financial index) are examined. Furthermore, the consistency of the January pattern is examined over four different time periods (January 1930 through December 1988, January 1930 through December 1949, January 1950 through December 1969, and January 1970 through December 1988).

The results show that from January 1970 through December 1988, for all the S&P component indexes in general, not only are January's mean returns the highest among the mean returns during any other month of the year, but also the coefficients of variation are the lowest among the coefficients of variation of monthly returns during any other month of the year.

Relevant Previous Research

In examining the seasonality of investment returns, many researchers recently have generated evidence indicating that average monthly returns are statistically different. Specifically, this seasonality in investment returns, referred to as the January effect or year-end effect, suggests that the average return in

January is statistically higher than the average return in any other month of the year. (See Brown, Keim, Kleidon, and Marsh, 1983; Gultekin and Gultekin, 1983; Keim, 1983; Pettengill, 1985; Reinganum, 1983; Rozeff and Kinney, 1976; and Tinic and West, 1984.)

Recently, however, this phenomenon has been tied to the small firm effect, as several researchers have documented that the high January returns accrue disproportionately to small firms, especially during the early days of January (Keim, 1983; Reinganum,1983). Relying on daily returns during different months of the year, these studies report that, in comparison to larger firms, small firms earn higher returns and that these higher returns are generated in the first few days of January. Roll (1983) and Blume and Stambaugh (1983) estimate that the magnitude of the small firm effect would be cut in half if annual, rather than daily, rebalancing of portfolios were assumed. Therefore, in order to reduce any possible bias introduced by daily rebalancing, monthly returns rather than aggregated daily returns for the month are used in this study.

On the other hand, Givoly and Ovadia (1983), using monthly return data, found that, due to tax-induced sales, the prices of many stocks over the last 35 years were depressed temporarily in December and then recovered in January. They concluded that this price recovery is a major contributor to the high returns observed in January. This effect is present in all firms, but it is much more pronounced in small firms. Investigating the January effect in overseas markets, Gultekin and Gultekin (1983) observed that, except for Australia, the higher monthly returns in other countries occur at the turn of their respective tax year. Gultekin and Gultekin interpret the findings as support for a tax-loss-selling hypothesis. They also suggest that the seasonality in these countries does not appear to be a size-related anomaly. In contrast, Brown *et al.* (1983) observed high returns in Australia during the months of January, July, August, and December. Because Australia follows a July-June tax year, their evidence did not support the tax-loss-selling hypothesis. Also, their findings suggest that, compared to larger firms, the smallest firms generated higher average returns across all months. Thus, the extent to which a January effect exists independent of the size effect is controversial. In addition, Berges *et al.* (1984) report that for Canada, before and after the capital gains tax was introduced, returns in January exceeded returns for other months of the year. Therefore, their findings also do not support the tax-loss-selling-pressure hypothesis as the entire explanation for the turn-of-the-year effect in stock returns.

Although the previous research findings generally support the presence of the January effect, particularly in small firms, none of the previously cited studies provide a comprehensive examination of the January effect for large firms or complete support for a tax-loss-selling hypothesis. Leaving the latter question for future research, this paper investigates the existence of the January effect in

large firm securities. The empirical evidence based on the monthly returns for the S&P composite and component indexes suggests that the monthly returns on the large firm indexes are not the same for different months of the year. Specifically, except for the S&P composite index during the period from January 1930 through December 1949, not only are January mean monthly returns higher than the mean returns during other months of the year, but January coefficients of variation also are the lowest compared to the coefficients of variation for the other months of the year.

Research Methodology

The use of daily data and the daily rebalancing of portfolios may contribute to the measurement of high January returns. In order to avoid this potential bias, monthly data for the S&P indexes were obtained from Standard & Poor's *Security Price Index Record.* For the S&P 500, the data were collected for the period from January 1930 through December 1988. Because of availability problems, data for the four component indexes (S&P industrials, S&P transportation, S&P utilities, and S&P financial) were limited to the period from January 1970 through December 1988.

The returns for each month and each index were calculated as follows:

$$(1)\quad R_{it} = (P_{it} - P_{it-1}) / P_{it-1}$$

where:

R_{it} = the return on a specific index in month t;
P_{it} = the value of a specific index in month t; and
P_{it-1} = the value of a specific index in month t-1.

The annualized monthly mean return ($\bar{x}$) (on the basis of 12 months), standard deviation (σ), and coefficient of variation ($\sigma/\bar{x}$) are calculated. This information is generated for all of the S&P indexes.

The consistency of the mean returns (by the month of the year) over the entire period and the subperiods (January 1930 through December 1988, January 1930 through December 1949, January 1950 through December 1969, and January 1970 through December 1988) is ascertained through the application of the following regression equation:

$$(2)\quad R_{it} = \sum_{i=1}^{12} \beta_i D_{it} + \xi_{it}$$

where:

i = 1 through 12 for January (February, ... , December), respectively;
β_i = the mean monthly return for any month;
D_{it} = 1 if the return in period t is for January (February, ... , December), 0 otherwise;
ξ_{it} = the residual term.

The significance level associated with β_i will indicate whether the mean monthly returns are statistically different from zero.

Results

The annualized mean monthly returns ($\bar{x}$) for the S&P 500 composite index and their standard deviations (σ) and coefficients of variations ($\sigma/\bar{x}$) are reported in Table 1. For the entire period, the month of January not only shows the highest (and statistically significant) mean return (25.67 percent, p-value: .0008), but also displays the smallest variation (coefficient of variation, $\sigma/\bar{x}$, of 1.4640).

Furthermore, Duncan's test statistic is used to make multiple comparison of monthly returns across different months of the year. The results in Table 2 show that for the composite index over the entire period (except for the months of July and August) January's mean monthly returns are the highest (at a 10 percent significance level). Earlier studies (e.g., Brown *et al.*, 1983; Officer, 1975; and Tinic and West, 1984) have reported that, like January, the month of July also displays anomalous stock returns. Thus, the current findings are consistent with those of previous studies.

An examination of the mean monthly returns and the coefficients of variation reveals that for the entire period tested, the highest return and the lowest dispersion around the mean return occur during the month of January. Thus, in terms of return and risk, January is the most attractive month of the year. For a clearer interpretation, these results (the first column of Table 1), are presented in Figure 1. Figure 1 shows the mean return and the area of ± 1 standard deviation (σ) for every month. January has the highest mean return and the lowest dispersion around its mean return. In other words, the month of January displays the most attractive return pattern of all the other monthly returns during the year. The only other month with similar desirable results (significantly positive return and low coefficient of variation) is July (mean return $\bar{x}$ 18.26 percent, p-value .0161). None of the other months reported returns that were statistically distinguishable from zero.

The results for the three subperiods reveal that the January performance remains surprisingly consistent (Table 1). Except for the month of July during the January 1930 through December 1949 period and the months of April and November during the January 1950 through December 1969 period, the month of January consistently shows the highest returns and the lowest variations per unit of return. More specifically, investments during January are preferable to investments during other months of the year if the investment's desirability is measured in terms of mean returns and coefficients of variation.

Consequently, an examination of both risk and return characteristics suggests that the month of January appears to be the most attractive because that month's mean returns are generally the highest and its coefficients of variation are usually the lowest during two of the three subperiods. Only during the January 1950 through December 1969 subperiod are April's and November's coefficients of variation lower than that of January. The mean returns by month and their respective dispersion for each of the three subperiods are plotted in Figures 2, 3 and 4.

Tinic and West (1984) report that January is the only month when shareholders consistently have been paid for taking risk and when small firm stocks have outperformed the market as a whole. In contrast, the findings of this study suggest that indexes representing large firm securities also earn a significantly positive return during January, and, in general, earn returns indistinguishable from zero during other months. Moreover, the evidence generated here supports the contention that January returns, on average, not only tend to be higher compared to returns in other months, but that the variation around the return in January is less than the comparable variation in other months. Although the month of July over certain subperiods also showed attractive results (in terms of significant return and lower risk), July did not have the same consistency as the month of January. The returns in January are also more attractive than returns during the other months of the year, however, as the variations per unit of return are the lowest in January. Thus, because the S&P composite index consists of large firm securities, *ceteris paribus*, the evidence suggests that the January effect exists independent of the size effect.

Because of greater sophistication on the part of today's investors in general and because of the gradual tightening of market regulations over time, it might be reasoned that financial markets are more efficient today than they were in the past. Consequently, one might pay more attention to the results of the recent subperiod (January 1970 through December 1988). Table 1 and Figure 4 again reveal that January returns are not only statistically positive and significant ($\bar{x}$: 27.08 percent; p-value: .0118), but their variations are also the lowest.

In an attempt to examine the existence of a seasonal effect across different industries, this study analyzed the mean annualized monthly returns ($\bar{x}$), their

standard deviations (σ), and the coefficients of variations ($\sigma/\bar{x}$) along with regression equation (2) for all S&P indexes. These results are presented in Table 3. The mean annualized returns for the S&P component indexes for the month of January are all positive and statistically different from zero. For example, for the S&P industrials, the mean January return is 26.43 percent with a p-value of .0165. Comparable values for the S&P transportation index are 32.49 percent and .0375; for the S&P utilities index they are 34.32 percent and .0010; and for the S&P financial index they are 30.12 percent and .0431, respectively.

January returns are consistently unusual across industries. Similar to the results for the composite index for the period from 1970 through 1988, for all component indexes January has the highest return (in no other months are returns significantly different at the .05 level) and the lowest variation per unit of return. Also, except for the industrial index, Duncan's test statistics in Table 2 indicate that January's mean return is significantly greater than that of at least one other month of the year for all component indexes. Thus, the results reported in Table 3 confirm the existence of a January effect.

Conclusion

The findings of this research demonstrate the existence of a January effect for the S&P 500 index over the period from January 1930 through December 1988. With some exceptions, not only are the January returns the highest among the monthly returns, but that month's variation per unit of return is also the lowest. Because this anomaly also exists over the three subperiods examined in this paper, one can conclude that this phenomenon is not a one time occurrence. Furthermore, as virtually all firms on the S&P indexes are relatively large in size, one can reason that the abnormal returns in January are independent of the small firm effect.

Also, consistently for all the S&P component indexes (i.e., S&P industrials, S&P transportation, S&P utilities, and S&P financial) the January mean monthly returns are the highest and have the lowest variations per unit of return compared to any other month of the year. Therefore, the similarity in the results for the S&P component indexes suggests that this seasonal anomaly exists in all industries represented by the S&P indexes.

In conclusion, the evidence presented in this paper strongly suggests the presence of the January effect in large firms. In addition, the high January returns exist regardless of the time period or the industries examined.

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Table 1

Annualized Monthly Returns, Standard Deviations, and Statistical Significance: Standard & Poor's Composite Index

Period	1/1930 - 12/1988		1/1930 - 12/1949		1/1950 - 12/1969		1/1970 - 12/1988	
	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)
January	0.2567 [0.0008]	0.3758 (1.4640)	0.2903 [0.1226]	0.2880 (0.9921)	0.2119 [0.0090]	0.3951 (1.8646)	0.2708 [0.0118]	0.4420 (1.6322)
February	0.0485 [0.5217]	0.5070 (10.4536)	-0.0098 [0.9573]	0.6496 (-66.2857)	0.0390 [0.6283]	0.3119 (7.9974)	0.1191 [0.2613]	0.5181 (4.3314)
March	0.0399 [0.5982]	0.3738 (9.3684)	-0.0852 [0.6413]	0.3911 (-4.5904)	0.0665 [0.4095]	0.2863 (4.3053)	0.1435 [0.1789]	0.4151 (2.8917)
April	0.0473 [0.5322]	0.6223 (13.1564)	-0.1305 [0.4757]	0.9643 (-7.3893)	0.2087 [0.0101]	0.3104 (1.4873)	0.0651 [0.5455]	0.3152 (4.8425)
May	0.0003 [0.9997]	0.7134 (2,362.252)	-0.0563 [0.7581]	1.0958 (-19.464)	0.0892 [0.2686]	0.3615 (4.0527)	-0.0348 [0.7457]	0.4706 (-13.5427)
June	0.0318 [0.6745]	0.5652 (17.7736)	0.0591 [0.7464]	0.7972 (13.4890)	-0.0665 [0.4096]	0.4577 (-6.8827)	0.1063 [0.3184]	0.3465 (3.2598)
July	0.1826 [0.0161]	0.4965 (2.7191)	0.4228 [0.0215]	0.6343 (1.5002)	0.1232 [0.1272]	0.4033 (3.2735)	-0.0081 [0.9431]	0.3036 (37.4144)

Table 1 (continued)
Annualized Monthly Returns, Standard Deviations, and Statistical Significance: Standard & Poor's Composite Index

Period	1/1930 - 12/1988		1/1930 - 12/1949		1/1950 - 12/1969		1/1970 - 12/1988	
	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)
August	0.1183	0.8906	0.2265	1.4101	0.0670	0.3699	0.0582	0.5413
	[0.1184]	(7.5258)	[0.2160]	(6.2256)	[0.4057]	(5.5209)	[0.5836]	(9.2924)
September	-0.0293	0.6207	-0.1060	0.8473	0.0119	0.3366	0.0084	0.5768
	[0.6983]	(-21.1843)	[0.5621]	(-7.9934)	[0.8829]	(28.2857)	[0.9404]	(68.5329)
October	-0.0411	0.6360	-0.1716	0.9155	0.0376	0.3410	0.0132	0.5167
	[0.5871]	(-15.4745)	[0.3482]	(-5.3351)	[0.6404]	(9.0691)	[0.9004]	(39.0841)
November	0.0439	0.4878	-0.0512	0.5068	0.2036	0.3537	-0.0237	0.5662
	[0.5622]	(11.1116)	[0.7794]	(-9.8984)	[0.0121]	(1.7372)	[0.8214]	(-23.8566)
December	-0.0098	0.4823	-0.2189	0.5865	0.1005	0.3267	0.0922	0.4478
	[0.8968]	(-49.2143)	[0.2360]	(-2.6793)	[0.2128]	(3.2507)	[0.3885]	(4.8562)
Observations	*708*		*240*		*240*		*228*	

Numbers in brackets are p-values indicating the probabilities that the mean monthly returns are zero

Numbers in parentheses are the coefficients of variation $(\sigma/\bar{x})$

Table 2
Summary of Duncan's Test Statistics for Pairwise Comparisons of Returns
for the Standard & Poor's Indexes
January 1930-December 1988

Period	Type of S&P Index	Months with Significantly Different Returns (90% level)	
1/1930 to 12/1988	Composite	January >	February, March, April, May, June, September, October, November, and December
1/1930 to 12/1949	Composite	July >	March, April, September, October, and December
1/1950 to 12/1969	Composite	January >	June;
		April >	June; and
		November >	June
1/1970 to -12/1988	Composite	January >	May
	Industrial		None
	Transportation	January >	May
	Utility	January >	February, March, April, May, August, September, November and December
		October >	May
	Financial	January >	May

Table 3
Annualized Monthly Returns, Standard Deviations, and Statistical Significance for the Standard & Poor's Indexes
January 1970-December 1988

Index	S&P 500		S&P Industrials		S&P Transport.		S&P Utilities		S&P Financial	
	Mean: ($\bar{x}$)	Std. Dev. (σ)	Mean: ($\bar{x}$)	Std. Dev. (σ)	Mean: ($\bar{x}$)	Std. Dev. (σ)	Mean: ($\bar{x}$)	Std. Dev. (σ)	Mean: ($\bar{x}$)	Std. Dev. (σ)
January	0.2708 [.0118]	0.4420 (1.63)	0.2643 [.0165]	0.4453 (1.68)	0.3249 [.0375]	0.6875 (2.11)	0.3432 [.0010]	0.5539 (1.61)	0.3012 [.0431]	0.5687 (1.88)
February	0.1191 [.2613]	.5181 (4.35)	0.1423 [.1947]	0.5525 (3.88)	0.1249 [.4092]	0.7056 (5.64)	-0.0400 [.6977]	0.3841 (-9.60)	0.0347 [.8099]	0.5730 (16.51)
March	0.1435 [.1789]	0.4151 (2.89)	0.1628 [.1382]	0.4381 (2.69)	0.1317 [.3843]	0.5182 (3.93)	-0.0374 [.7167]	0.3680 (-9.83)	0.2262 [.1179]	0.5507 (2.43)
April	0.0651 [.5455]	0.3152 (4.84)	0.0826 [.4511]	0.3254 (3.93)	0.0910 [.5477]	0.5075 (5.57)	-0.0779 [.4499]	0.4179 (-5.36)	0.0800 [.5793]	0.5727 (7.15)
May	-0.0348 [.7457]	0.4706 (-13.54)	-0.0341 [.7556]	0.4814 (-14.11)	-0.1392 [.3578]	0.6613 (-4.75)	-0.1212 [.2402]	0.4983 (-4.11)	-0.1633 [.2583]	0.6782 (-4.15)
June	0.1063 [.3184]	0.3465 (3.25)	0.1094 [.3185]	0.3454 (3.15)	-0.0036 [.9808]	0.5488 (-152.44)	0.1434 [.1649]	0.5030 (3.50)	0.1389 [.3362]	0.6102 (4.39)
July	-0.0081 [.9431]	0.3036 (-37.41)	-0.0149 [.8921]	0.3252 (-21.82)	-0.0428 [.7772]	0.5948 (-13.89)	0.0858 [.4053]	0.3077 (3.58)	-0.0652 [.6513]	0.5715 (-8.76)

Table 3 (continued)
Annualized Monthly Returns, Standard Deviations, and Statistical Significance for the Standard & Poor's Indexes
January 1970-December 1988

Index	S&P 500		S&P Industrials		S&P Transport.		S&P Utilities		S&P Financial	
	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)	Mean: $(\bar{x})$	Std. Dev. (σ)
August	0.0582 [.5836]	0.5413 (9.29)	0.0595 [.5869]	0.5491 (9.22)	0.0742 [.6240]	0.6870 (9.25)	0.0207 [.8405]	0.4930 (23.81)	0.0995 [.4905]	0.7079 (7.11)
September	0.0084 [.9404]	0.5768 (68.53)	0.0151 [.8904]	0.5926 (39.24)	0.1222 [.4196]	0.8468 (6.92)	-0.0440 [.6696]	0.4452 (-10.11)	0.0175 [.9035]	0.6297 (35.98)
October	0.0132 [.9004]	0.5167 (39.08)	-0.0033 [.9758]	0.5334 (-161.63)	0.1475 [.3301]	0.7643 (5.18)	0.1884 [.0685]	0.3741 (1.98)	0.0082 [.9548]	0.7268 (88.63)
November	-0.0237 [.8214]	0.5662 (-23.85)	-0.0316 [.7731]	0.5693 (-18.01)	0.0465 [.7587]	0.7960 (17.11)	0.0454 [.6593]	0.5362 (11.81)	0.0165 [.9091]	0.7729 (46.84)
December	0.0922 [.3885]	0.4478 (4.85)	0.0932 [.3953]	0.4584 (4.91)	0.2026 [.1813]	0.4591 (2.26)	0.0491 [.6335]	0.4295 (8.74)	0.0468 [.7457]	0.5130 (10.96)
Observations	228		228		228		228		228	

Numbers in brackets are p-values indicating the probabilities that the mean monthly returns are zero

Numbers in parentheses are the coefficients of variation $(\sigma/\bar{x})$

Figure 1
Returns for the S&P 500 by Month
January 1930 through December 1988

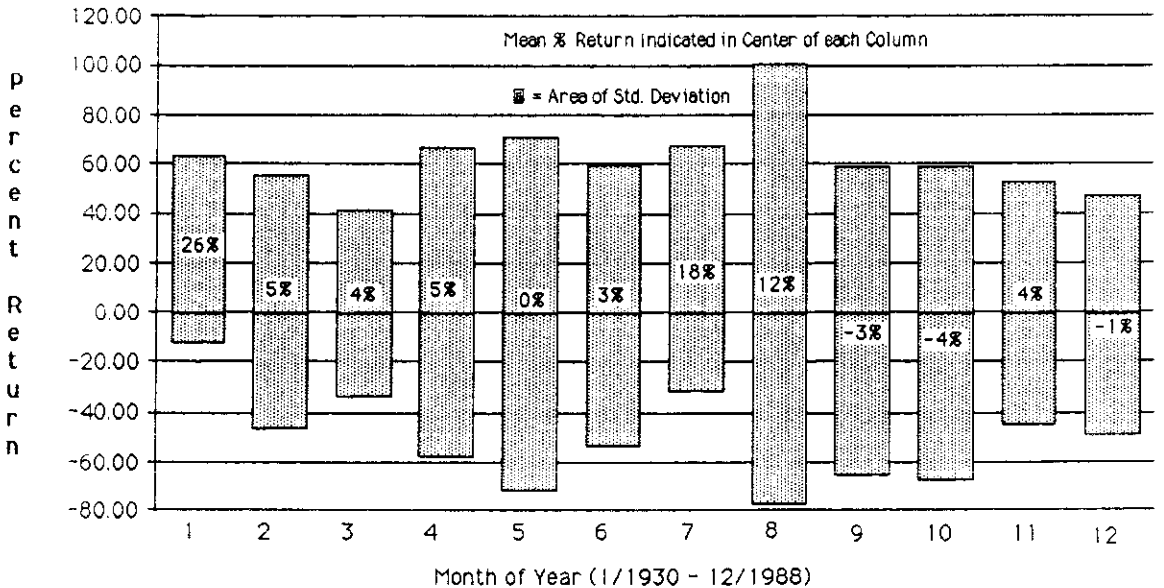

Figure 2
Returns on the S&P 500 by Month
January 1930 through December 1949

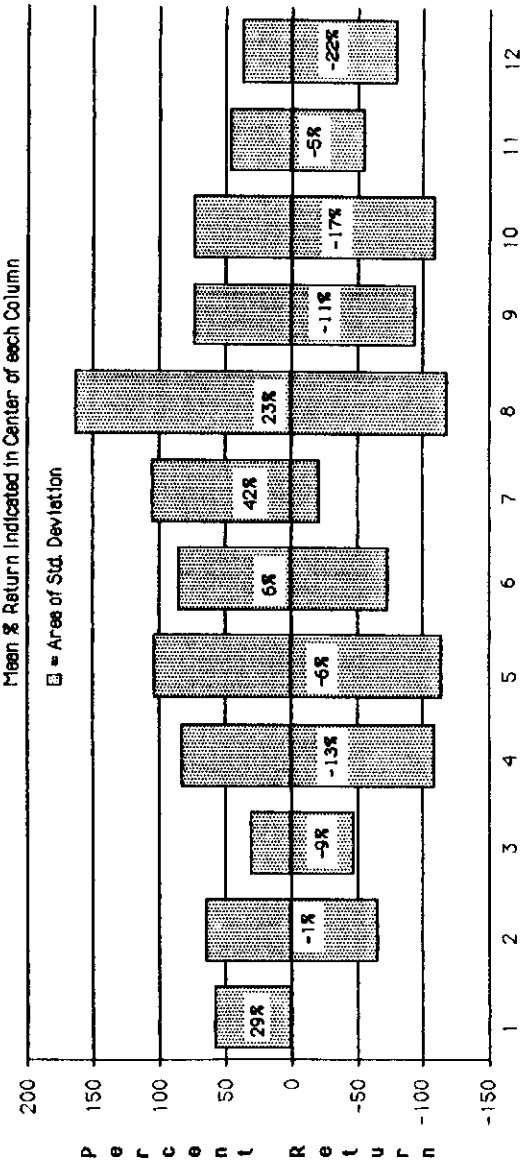

Figure 3
Returns on the S&P 500 by Month
January 1950 through December 1969

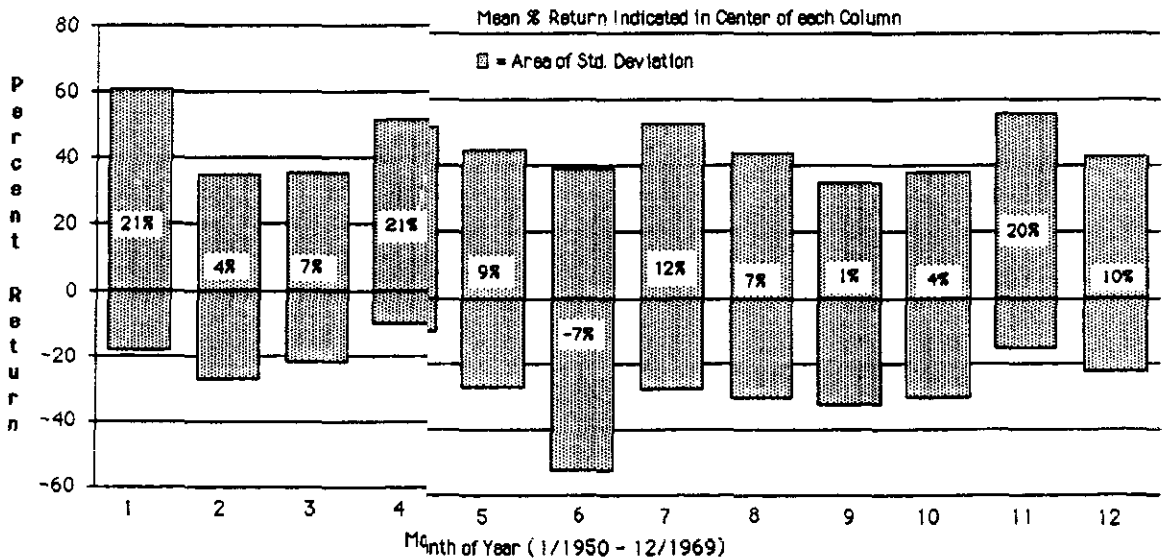

Figure 4
Returns on the S&P 500 by Month
January 1970 through December 1988