Some Aspects of the Performance of Non-Convertible Preferred Stocks

by

John S. Bildersee*

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RODNEY L. WHITE CENTER
FOR FINANCIAL RESEARCH

University of Pennsylvania

The Wharton School

Philadelphia, Penna. 19104

Non-convertible preferred stocks[1] have been the subject of far less discussion than bonds and common stocks. Some of these discussions suggest that preferred stocks combine some features that are inferior to those of bonds with some features that are inferior to those of common stocks.[2] Such discussions suggest that preferred stocks may represent an inferior class of investments relative to bonds and common stocks. However, portfolio theory suggests that every security, including preferred stocks, is an integral part of the market place since the investor is always adequately compensated for any perceived risk by the return he expects from the security. This paper employs the market model from portfolio theory and a multiple regression analysis to investigate the holding period returns to preferred stocks. In particular, we investigate and quantify some traditional thoughts about the performance of preferred stocks as well as integrate and compare the performance of preferred stocks with the performance of common stocks of the same company and with the performance of the alternative assets in the market place. Our sample also gives us an opportunity to do some further tests of the empirical strength of the market model.

As we shall see, the results obtained here appear consistent with those expected for the market model. Section II describes the measure of risk, beta, to be used and discusses its usefulness in this

context briefly. After describing the sample in Section III, Section IV presents the results obtained from applying the market model. Section V presents a multiple regression analysis of the preferred stocks.

II. Beta as a Measure of Risk

The market model, as proposed by Markowitz (12) and developed by Sharpe (16, 17), Fama (7, 8) and others[3], states that we can represent the return on a security j in period t, $\tilde{R}_{jt}$,[4] as

$$\tilde{R}_{jt} = \alpha_j + \beta_j \tilde{R}_{mt} + \tilde{\epsilon}_{jt}$$

where α_j and β_j are parameters indicating the relation between the return on asset j and the return on the market portfolio in period t, $\tilde{R}_{mt}$. The $\tilde{\epsilon}_{jt}$ are random variables with mean zero and variance $\sigma^2(\tilde{\epsilon}_j)$ and represent the independent factors unique to security j.

Beta for any investment j is a measure of the systematic risk investors associate with that particular investment relative to the risk of the market portfolio. Moreover, beta can have any value and measure any level of systematic risk relative to the market.[5] Since beta is a continuous variable we shall be able to compare the relative systematic risk of preferreds directly with that for any other preferreds and with common stocks.

Phrases stating that a preferred stock is 'like a bond' or 'like

a common stock' take an additional meaning in the context of this paper. In this paper these phrases refer to the general performance characteristics of the security. Thus preferred stocks that behave 'like bonds' would be those that have betas and average returns like those of bonds, whereas preferred stocks that behave 'like common stocks' would be those that have betas and average returns like those of common stocks.[6]

III. The Preferred Stock Sample

Our goal in this paper is to study the risk-return performance of preferred stocks. To achieve this goal we selected a sample of securities that emphasizes the variety of large companies issuing preferred stocks. We assumed that such a sample was most likely to enable us to investigate a wide range of investment performances during the sample period. Our sample includes month-end wealth relatives, adjusted for dividends and capital changes, for 72 preferred stocks listed on the New York Stock Exchange continuously from March, 1956 to March, 1966. These securities represented 60 industrial, utility, transportation and financial corporations. For a corporation to qualify for the study its common stock also had to be listed on the N.Y.S.E for the entire period.[7]

Moreover, at least one preferred security issued by each company in the study had to pass a minimum trading requirement.[8] The minimum trading requirement helps to ensure up-to-date prices or relatively narrow bid-ask spreads for the estimation of market

prices.[9] The sample might be atypical if there were any systematic differences among the performances of securities with large numbers of outstanding shares relative to typical preferred securities. However, up to two additional preferred stocks per company were added to the sample. These preferred stocks were listed on the N.Y.S.E. during the full sample period, but did not have to meet the trading requirement.[10] These securities, which tend to compensate for any systematic characteristics of the sample due to the minimum trading requirements, will also give us an opportunity to observe the performance of multiple equivalent securities issued by given companies.[11]

We restricted the number of utility preferred stocks in the sample and included 16 of the qualifying utility preferreds. We assumed that inclusion of additional utility corporations and their preferreds would not have increased the variety of the securities in the sample.[12]

IV. Preferred Stocks and the Market Model

In this section we shall use a common stock index to represent the 'basic underlying factor' of the market model. Then we shall employ a bond index and a 'market' index in the same model. In each case we shall investigate the betas generated for our sample.

We shall use time series data of ex-post returns in risk premium form to estimate the distributions of expected risk premiums for each security in the sample.[13] That is, we assume the

process is of the form

$$(\tilde{R}_j - R_F) = \beta_j(\tilde{R}_m - R_F) + \tilde{e}_j$$

where $(\tilde{R}_j - R_F)$ is the holding period risk premium for security j, $(\tilde{R}_m - R_F)$ is the holding period risk premium for the market portfolio and $\tilde{e}_j$ is a random variable with an expected value zero and a variance σ_j^2.[14] In this paper we use the one month treasury bill rate to represent the riskless rate.

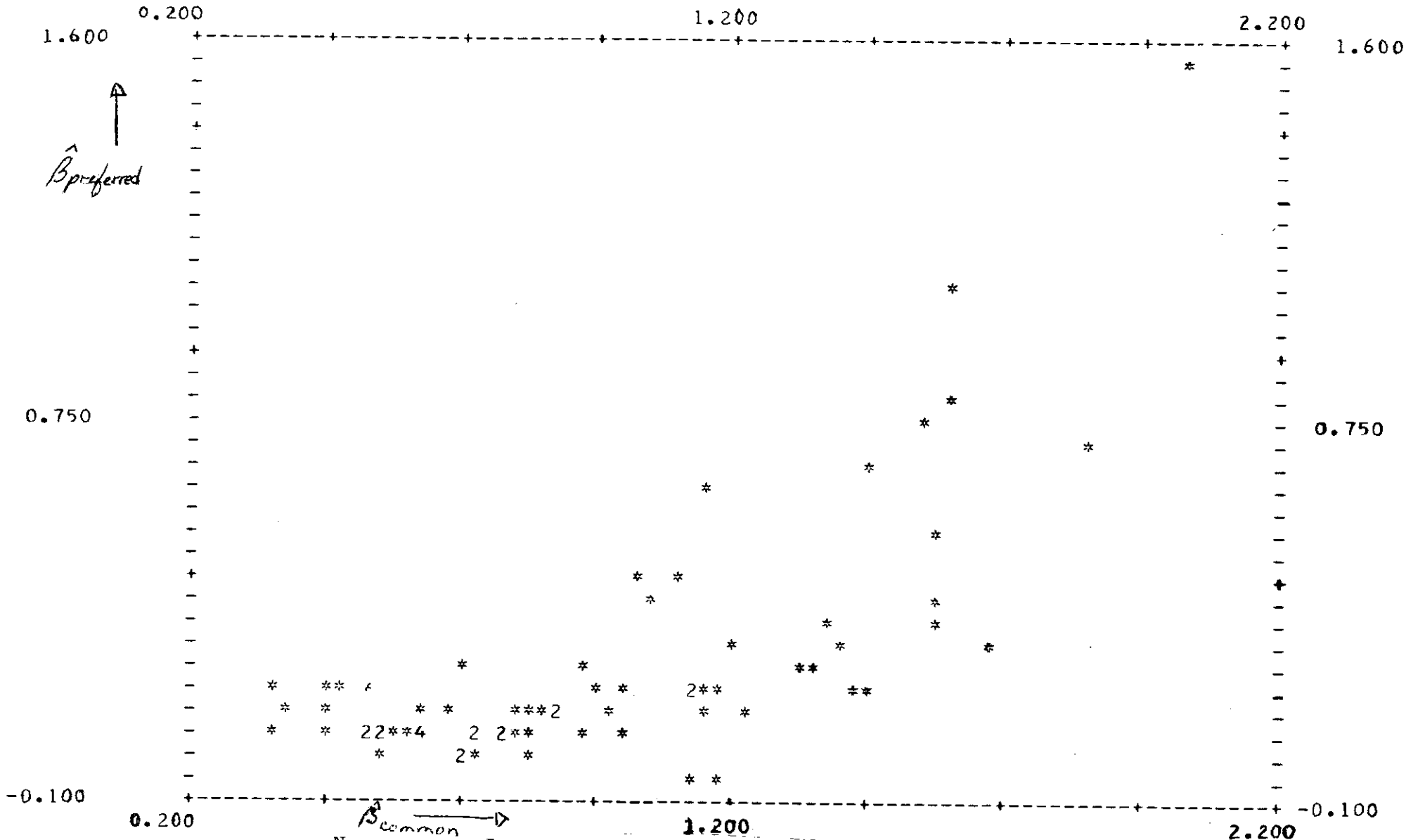
Several tests were performed to check the adequacy of the market model as a return generating mechanism for preferred stocks. For the most part, the results were similar to those obtained by other researchers in the case of common stocks.[15]

1. Preferred Stocks and a Common Stock Index

In this section we shall use Fisher's Link Relative Common Stock Index to represent the market index.[16]

We would expect a beta for a company's preferred stock to be less than the beta for the same company's common stock. Owners of each security suffer the same business risks relative to the market. However, since common stockholders have subordinated ownership relative to preferred stockholders, common stockholders suffer financial risks relative to the market in excess of those suffered by preferred stockholders. As expected and as can be seen from Figure 1, every company's preferred stocks had betas which were less than the beta for the same company's common stock.[17] Furthermore, in every case where multiple preferred stocks of the same company had equal right to assets and to dividends, the betas for these preferred stocks were not significantly different from each other.

Table 1 contains the distributions of beta for the preferreds stocks and the common stocks from the security by security regressions on the common stock index. It appears that the preferred stocks in this sample were issued by companies issuing common stocks with a typical set of risks. The mean of the beta distribution for the common stocks is not significantly different from 1.0, the expected mean for a random sample of common stocks.



Name	Lower	Upper	Scale	Points on Graph
$\hat{\beta}_{preferred}$	-0.100	1.600	0.050	72
$\hat{\beta}_{common}$	0.200	2.200	0.250	

Figure 1 - Joint Distribution of Preferred Stock $\hat{\beta}$'s and the Same Company's Common Stock $\hat{\beta}$'s(SCCS)

TABLE 1

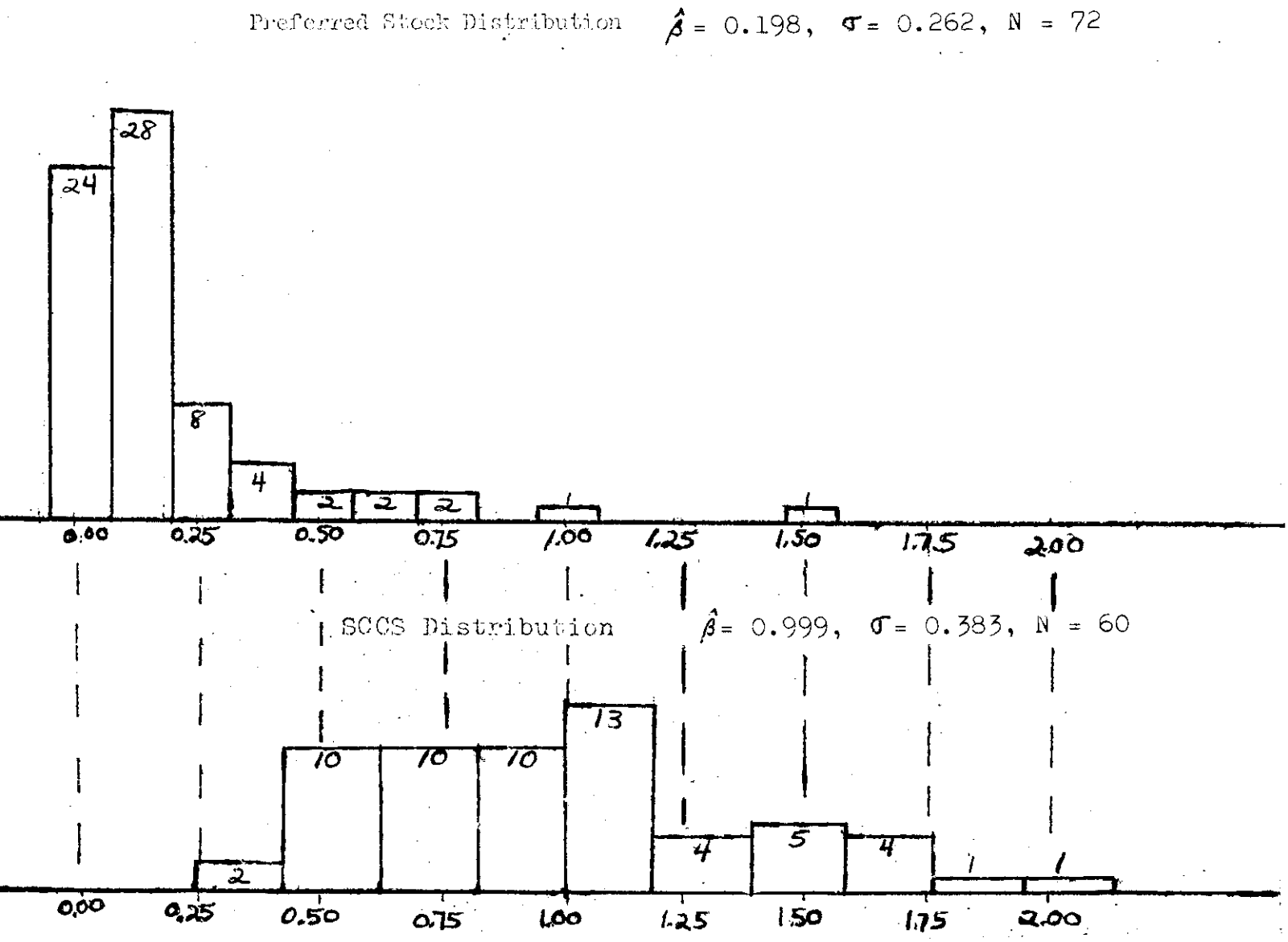
Distributions of Beta from Regressions on the Common Stock Index

Sample	Observations	Mean	Std. Dev.	Aver. R^2
Preferreds	72	0.198	0.262	0.061
SCCS-(Same Company's Common Stock)	60 [18]	0.999	0.383	0.284

Sample	Ranges of Beta: Inter-Quartile	Ranges of Beta: Extremes	Range of R^2 Extremes
Preferreds	0.053-0.211	-0.029-+1.538	$0.0^3$4-0.334
SCCS	0.693-1.216	+0.356-+2.025	0.071-0.532

Note from Table 1 that the distribution of preferred stock betas has less dispersion than does the distribution of common stock betas. Note also that the mean beta for preferred stocks is significantly less than the expected mean for common stocks. This suggests that the preferred stock class may be narrower than the common stock class and that the typical preferred stock has less risk than the typical common stock. The mean beta for preferreds is also significantly greater than zero so preferreds appear positively correlated with the common stock index. However, the relatively low average R^2 suggests that the relation between the typical preferred stock and the common stock index may be weaker than the relation between the typical common stock and the common stock index.

Figure 2 compares the distributions of the preferred stock and SCCS samples. Both distributions appear skewed to the right.



Each bar is 0.5 standard deviations wide.

Figure 2 - Preferred Stock and SCCS Distributions

Moreover, the distributions overlap each other so that it is possible to speak of a range of beta values which appear primarily representative of preferred stocks, a range which appears representative of common stocks and a range which includes securities from both the preferred and common stock classes. The figure also shows that the preferred stock of some companies have more systematic risk than common stocks of some other company.

The figure suggests a way of grouping preferred stocks which may provide an immediate, simple test of the value of using a market approach to consider the risk and performance of preferreds. In particular, we can divide our preferred stock sample into a sample of preferreds with betas within the range which appears to be representative primarily of preferred stocks and into a sample of preferreds with betas outside this range. Purchasers of preferred stocks may want the benefits of a senior security. However, if they invest in a preferred stock with a beta that is not within the range of betas that appears to be representative primarily of preferred stocks, then they will not get the benefits of a preferred stock in the sense that they could also purchase a common stock that would provide the systematic risk associated with the beta value of this particular preferred security. Since the latter type of preferred stock illustrates as great a level of systematic risk as some junior security,

it could be called a low quality preferred stock.[19]

The securities with betas in the range that is representative primarily of preferred stocks provide investors with less systematic risk than common stocks relative to the common stock index.

We can use the lowest beta from a random sample of common stocks (0.152) to represent the low end of the range for common stock betas.[20] There are 46 'high quality' preferreds with betas less than 0.152. The other 26 preferreds have betas that are over 0.152 and are 'low quality' preferreds.

To test the value of this division we can ask if the typical high quality preferred stock, so defined, performs differently than the typical low quality preferred stocks. In particular, we can compare an index composed solely of high quality preferreds with an index composed solely of low quality preferreds.[21]

Note from Table 2 and Table 3 that the risk premium, the

TABLE 2

Mean Return for Chosen Indexes
Risk Premium Form

Index	Mean
High Quality Preferreds	0.041%/mo.
Low Quality Preferreds	0.269
Common Stocks	0.846

variance and the covariance with the common stock index are all lower if one invests solely in high quality preferreds than if he invests solely in low quality preferreds. It appears that

TABLE 3

Variance-Covariance Matrix
for Chosen Indexes

Index	Hgh. Qual. Pref.	Lw Qual Pref.	Common Stocks
High Quality Preferreds	1.778	1.209	1.249
Low Quality Preferreds		3.589	5.379
Common Stocks			13.854

low quality preferreds behave more like common stocks than do high quality preferreds. Moreover, Table 4 suggests that the

TABLE 4

Correlation Matrix for Chosen Indexes

	High Qual. Preferreds	Low Qual. Preferreds	Common Stocks
High Quality Preferreds	1.0	0.518	0.252
Low Quality Preferreds		1.0	0.763
Common Stocks			1.0

performance of the typical low quality preferreds appears more closely correlated to that of the common stocks than to that of the high quality preferreds.

Table 5 indicates that the beta distribution for the high quality preferreds was tighter than that for low quality preferreds.

TABLE 5

Distributions of Beta from Regressions on
the Common Stock Index

Sample	Observations	Mean	Std. Dev.	Aver.R^2
High Quality Preferreds[22]	46	0.070	0.046	0.022
Low Quality Preferreds	26	0.423	0.329	0.130

In addition, it suggests that the association between the high quality preferred index and the common stock index was less than that between the low quality preferred index and the common stock index.

2.Preferred Stocks and a Bond Index

We also compared the performance of preferred stocks and common stocks to that of a bond index. The index, which is described fully in Bildersee (3), is based on holding period returns of a broad sample of U.S. Goverment treasury bills, notes and bonds.

The index is composed of several subindexes of U.S. Government bonds. At any time, each subindex includes only those government bonds with approximately the same term to maturity. These terms to maturity are listed in Table 6. In time any subindex has an approximately constant term to maturity and each bond moves from one subindex to the subindex with the next shorter term to maturity as the bond approaches maturity. Since each subindex remains a constant proportion of the Government bond index in time, the index, which has an average risk premium of 0.034% per month and a variance of 0.282, also has a fairly constant term to maturity in time.

TABLE 6

Terms to Maturity for Subindexes Contained in the Government Bond Index

Subindex	Range of Terms to Maturity Indluded in Subindex*
1	1 month
2	2 months
3	3-6 months
4	7-12 months
5	13-24 months
6	25-36 months
7	37-48 months
8	49-72 months
9	73-108 months
10	109-180 months
11	Over 15 years

*To be included in a given subindex for a given month a security had to have a term to maturity associated with that subindex at the end of the month.

The bond index does not represent the performance of any single bond. Instead, the bond index should indicate the performance of the typical bond-like security with a constant term to maturity and may best indicate the responsiveness of bonds and bond-like securities to events typically thought to affect the bond market.

Preferred stocks that are 'like bonds' should show a relatively strong association with this index. In particular, high quality preferreds which were different from common stocks might perform like bonds -- the other form of security to which preferreds are usually compared. We would expect that high quality preferreds which perform most like bonds to be riskier than government bonds and hence to have high betas and a high correlation relative to the bond index. However, lower quality preferreds are less likely to be affected solely by those events affecting government bonds and should have a lower correlation relative to the government bond index. They are also likely to have lower betas relative to the bond index.[23]

Table 7 shows that the typical preferred stock was related positively to the bond index. It appears that preferred stocks are more strongly associated with bonds than are the same company's common stocks. However, the average and

range for R^2's for the preferreds were about the same as when the preferred stocks were regressed on the common stock

TABLE 7

Distributions of Betas from Regressions on the Government Bond Index

Sample	Observations	Mean	Standard Deviation	Average R^2
Preferred Stocks	72	0.820	1.118	0.089
SCCS	60	-1.228	1.790	0.022

Ranges of Beta

Sample	Interquartile	Extremes	Range of R^2 Extremes
Preferred Stocks	0.346-1.676	-3.201-+2.821	0.0^34-0.360
SCCS	-2.288-+0.141	-5.384--1.825	0.051-1.825

index. Thus the average association between preferreds and the bond index appears no stronger than does the association between preferreds and the common stock index. It appears that the preferred stocks in this sample are not, as a group, more closely associated with bonds or common stocks than with the other security.

However, this result may not hold for individual preferred stocks. In particular, the performance of our high quality preferreds relative to the bonds may differ substantially from the performance of our low quality preferreds relative to the bonds

index. Note from Table 8 that the bond index is more closely related to the index of high quality preferreds than it is to the index of low quality preferreds. Moreover, the correlation between the high quality preferreds index and the bond index is

TABLE 8

Correlation Matrix for Chosen Indexes

	Government Bonds	High Quality Preferreds	Low Quality Preferreds
Government Bonds	1.0	0.538	-0.016
High Quality Preferreds		1.0	0.518
Low Quality Preferreds			1.0

about as high as that between the high quality preferreds index and the low quality preferreds index. This result, with the result suggesting that low quality preferreds perform more like common stocks than like high quality preferreds, from Table 4, suggests that there may be a dichotomy of performance between the two sets of preferreds.

There were many negative betas when the preferred stocks were regressed on the bond index. Table 9 shows the direction of the association appears related to the quality of the preferred stock. Individual high quality preferreds appeared to be related positively with the bond index, but the results were mixed for the low quality preferreds. Note from Table 10 the difference in the strength of the association between preferreds of each quality and the bond index. This table and Table 5 suggest

TABLE 9

Signs of the Preferred Stock Betas from Regressions on the Government Bond Index

Sample	Sign +	Sign -	Total
High Quality Preferreds	45	1	46
Low Quality Preferreds	13	13	26
Total	58	14	72

that the typical high quality preferred may be associated more closely with bonds than with common stocks. However, these tables also suggest that the typical low quality preferred stock appeared to be associated more closely with common stocks than with bonds.

TABLE 10

Distributions of Beta from Regressions on the Government Bond Index

Sample	Observations	Mean	Standard Deviation	Average R^2
High Quality Preferreds	46	1.413	0.728	0.131
Low Quality Preferreds	26	-0.229	1.099	0.016

3. Preferred Stocks and a "Market" Index

A performance index composed solely of common stocks or of government bonds may not provide an appropriate measure of the performance of the entire market. In this section we shall use an index composed of 65% common stocks, 5% preferred stocks and 30% government bonds to represent a market index.[24]

As Table 11 shows the beta distributions have higher means and greater dispersion when the market index is used than when the common stock index was used. Because the variance of returns

TABLE 11

Distributions of Beta from Regressions on the Market Index

Sample	Observations	Mean	Standard Deviation	Average R^2
Preferred Stocks	72	0.325	0.391	0.069
SCCS	60	1.516	0.568	0.282

Sample	Ranges of Beta		Range of R^2
	Inter-Quartile	Extremes	Extremes
Preferred Stocks	0.115-0.341	-0.028-+2.345	0.05-0.334
SCCS	1.070-1.848	+0.571-+3.066	0.069-0.501

to the typical common stock is much greater than for preferreds and for bonds, common stocks dominate the market index. It turns out that the results obtained from this index differ only in scale. In particular, they are about 50% greater than those obtained from using the common stock index. If our market index represents the market well, it appears that preferred stocks have less systematic risk than the market while common stocks suffer more risk than the market. Other conclusions reached from using beta distributions based on this index are not different from using the beta distributions based on the common stock index.

4. Preferred Stocks and Multiple Indexes

The market model suggests that one index may be sufficient to estimate the systematic risk of a security. However, there have been many suggestions for the use of multiple indexes to identify distinct sources of risk including identification of industries, particular classes of securities and different nations.[25]

The correlation between the common stock index and the government bond index was -0.149 and the correlation between the market index and the government bond index was -0.007. These indexes, with correlations suggestive of zero correlation, will be used in multiple regressions to test if an additional variable would increase the explanatory power of the market model substantially.[26] We should remember that the bond index does not represent any single security. Since the bond index maintains a relatively constant term-to-maturity and since there is no default risk associated with the securities in the index the index should respond primarily to changes in the interest rate.[27]

Table 12 shows the results when preferred stocks and the same companies' common stocks are regressed on the common stock index and the government bond index in multiple regression form. In the case of the preferreds, both of the coefficients for the multiple regression were greater than the betas generated when the indexes were used alone. The coefficient relative to the

TABLE 12

Distributions of Coefficients When Preferred and Common Stocks Are Regressed on the Common Stock Index and the Bond Index in Multiple Regression Form

		Common Stock Index		Bond Index		
Sample	Obs.	Mean	Std.Dev.	Mean	Std. Dev.	Aver.R^2
Preferred Stocks	72	0.227 (0.198)*	0.252 (0.262)	1.015 (0.820)*	1.017 (1.118)	0.161 (0.061)° (0.089)+
SCCS	60	0.986 (0.999)*	0.379 (0.383)	-0.146 (-1.228)	1.565 (1.790)*	0.298 (0.284)° (0.022)+

*The numbers in parentheses are the results obtained from regressing the chosen sample on the chosen index alone. They are taken from Tables 1 and 6 for comparison purposes.

°Average R^2 obtained from using the common stock index alone as the independent variable.

+Average R^2 obtained from using the bond index alone as the independent variable.

common stock index for the SCCS sample was slightly less than the beta based on the common stock index alone. The coefficient for the bond index increased substantially in the multiple regression. However, the bond index adds little to the regression in this case.

The variance explained for the common stock sample isn't improved substantially by addition of the bond index to the common stock index for the multiple regression. However, the improvement obtained with the multiple regression approach for the preferred stock sample suggests that use of these uncorrelated indexes

may aid in the analysis of the performance of some classes of assets.

Table 13 also suggests that multiple regressions may improve the analysis of a security's performance. When we used the multiple regression, many common stocks showed significant associations with both indexes. Preferred stocks showed a

TABLE 13

Significant Estimates Obtained When Using the Common Stock Index and the Bond Index in a Multiple Regression

			Significant Estimates*			
Sample	Obs.		Common Stock Index Only**	Bond Index Only**	Both Indexes°	At Least 1 Sig. Obs.
Preferred Stocks	72	T=2*	26	17	24	67
		T=1*	15	4	52	71
SCCS	60	T=2*	44	0	16	60
		T=1*	29	0	31	60

*A significant estimate is one that is accompanied by a T-Value with an absolute value of at least 2(1).

**When the multiple regression was used, the only significant estimate was for the stated index. If we use the same row T-Value as the appropriate dividing line between significance and non-significance for the other index, then the estimate based on the other index was not significant.

°Estimates based on each of the independent variables were significant in the multiple regression.

variety of results. If a T-Value greater than two is taken as indicating that a coefficient is significantly different from

zero, then we found that 26 preferreds were associated only with the common stock index in the multiple regression. We also observed 17 preferreds that appeared to have significant associations only with the bond index in the multiple regression. Moreover, 24 preferreds appeared to be associated significantly with both indexes simultaneously. If we take a T-Value over one as a measure of significance, then 52 preferreds and 31 common stocks were related to both indexes at once.

Note from Table 14 that if the preferred stocks were divided by quality, then there was a distinct difference between the high and low quality preferreds. The low quality preferreds showed a pattern similar to that for common stocks. However, the high quality preferreds appeared to be significantly related to bonds alone or to both the bond and common stock indexes more often than to common stocks alone.

TABLE 14

Significant Estimates Obtained When Using the Common Stock Index and the Bond Index in a Multiple Regression

			Significant Estimates*			
Sample	Obs.		Common Stock Index Only**	Bond Index Only**	Both Indexes°	At Least 1 Sig. Obs.
High Quality Preferreds	46	T=2*	3	17	21	41
		T=1*	1	4	40	45
Low Quality Preferreds	26	T=2*	23	0	3	26
		T=1*	14	0	12	26

*A significant estimate is one that is accompanied by a T-Value with an absolute value of at least 2(1).

**When the multiple regression was used the only significant estimate was for the stated index. If we use the same row T-Value as the appropriate dividing line between significance and non-significance for the other index, then the estimate based on the other index was not significant.

°Estimates based on each of the independent variables were significant in the multiple regression.

Table 15 shows the distributions of the coefficients for each index when the securities were divided by quality. Most of the coefficients were about equal to the coefficients obtained when each index was used alone as the independent variable. However, the average coefficient for the low quality preferreds.

TABLE 15

Distributions of Coefficients-Regression on the Common Stock Index and the Bond Index in Multiple Regression Form

		Common Stock Index		Bond Index	
Sample	Obs.	Mean	S.D.	Mean	S.D..
High Quality Preferreds	46	0.102 (0.072)*	0.049 (0.047)*	1.434 (1.326)*	0.745 (0.732)*
Low Quality Preferreds	26	0.427 (0.412)*	0.317 (0.304)*	0.218 (-0.178)*	0.851 (1.152)*

*The numbers in the parentheses are the results obtained from regressing the chosen sample on the chosen index alone. They are stated here for comparison purposes only.

relative to the bond index changed from negative to positive.

No test presented here has suggested that this particular relationship is definitely positive or negative.

It is possible that some of these results are due simply to a misspecification of the 'true' market index, as we used the common stock index in this analysis. We explored this possibility as we also regressed each preferred and common stock of each company on our estimate of the market index and the government bond indexes in multiple regression form. The results were virtually identical to those obtained from our use of the common stock and government bond indexes together.[28]

Conclusions

The series of tests performed in this paper suggest that we can have confidence that beta is crudely consistent with measures of risk as a variety of tests turned up no real anomalies. We found that preferred stocks have lower betas than do common stocks of the same companies. It also appears that preferreds with low betas relative to the common stock index perform primarily like bonds in the market while preferreds with higher betas perform primarily like common stocks in the market. Moreover, our examination of preferreds has suggested that these securities form an integral part of the market place. Our study also suggests that a multiple regression approach to an analysis of risk may be a useful extension of the market model and may aid studies of classes of securities.

FOOTNOTES

*Assistant Professor, University of Pennsylvania. The author is grateful to Merton Miller, Eugene Fama, Nicholas Gonedes, Robert Hamada, Charles Nelson, Harry Roberts and Joshua Ronan for helpful remarks, but, of course is responsible for any errors. This paper is based on the author's dissertation.

[1]We consider only non-convertible preferred stocks in this paper.

[2]See Amling (2), p. 155, for a typical statement of this position. Amling, however, does not suggest that this approach is the proper one to take with respect to preferred stocks.

[3]Fama (6) provides a useful review of the model's current status.

[4]The tilde (~) denotes a random variable.

[5]Typical traditional quality ratings (e.g. Moody's and Standard and Poor's) use discrete ratings schemes and use rating procedures and scales that are separate and distinct for each class of securities.

[6]This does not mean that a preferred stock that is 'like a bond' or 'like a random stock' has to have a perfect positive correlation with some bond or common stock.

[7]This requirement imparts a survivorship bias on the sample. However, tests using a sample of securities on the exchange for portions of this period yielded results virtually identical with those stated in the paper.

The March, 1956 to March, 1966 period was chosen as it was the most recent 10 year period available on the Chicago tape developed by the Center for Research in Security Prices, University of Chicago. Such data are necessary for some of our tests. These tapes have since been updated. See Bildersee (3) for a full discussion of the preferred stock sample.

[8]We required that securities trade at least 4,000 shares

between January 1966 and March 1966. Since the number of shares outstanding fell during the period for the typical preferred stock, this trading requirement suggests that the typical preferred in the sample may have been more active earlier in the period.

[9]If there were no trading price for the security in question, then the mean of the bid and ask quotes was used as a substitute for the price.

[10]Eight companies were represented by two preferreds and two companies were represented by three preferreds.

[11]Equivalent securities in this paper are those securities which have equal rights to assets and to dividends as stated by Moody's manuals.

[12]The results obtained in this paper support this assumption. In addition some traditional rating agencies, like Moody's, show less differentiation among rated utility preferreds than they do among other rated preferreds. In addition, we subsequently looked at a sample of 28 additional NYSE preferreds. The observations obtained for this sample are consistent with those reported for the utility preferreds included in this paper.

[13]Roll(15) indicates that, without adjustment for the riskless rate, use of the returns from time series data would bias the results of the analysis as the riskless rate varies from period to period. See Friend and Blume (10), Miller and Scholes (13) and Black, Jensen and Scholes (4) for discussions of additional problems encountered when using the market model and the capital asset pricing model to explain differential returns in the market.

[14]For simplicity of exposition we will use the standard deviation and variance of distributions as measures of dispersion. This replaces measures of dispersion which are associated with the stable Paretian distributions that appear to describe returns on assets. This issue is not critical as we will be concerned primarily with the betas.

[15]These tests suggested that the stationarity of preferred stocks may be related to changes the issuing company's preferred dividend policy such as the payment of an accumulated arrearage or the beginning of this accumulation of such an arrearage. See Bildersee (3).

[16]See Fisher (9).

[17]The figure also shows one point far apart from the others. The tests were repeated excluding this point and yielded virtually identical results.

[18]Each firm is represented once in the same company's common stock sample regardless of the number of preferred stocks representing the company.

[19]This use of quality is not identical with the term as it is used by rating agencies. We are talking about an expected performance for a given holding period whereas ratings agencies speak primarily of the probability of default before or at some maturity date for bonds or of the dividend yield stability for preferreds.

[20]Other potential criteria include a split based on T-values a split based on correlations and a split using beta equal to 0.25 as the dividing line. These procedures, which provided results that were very similar to those reported are all correlated with the one we chose. When we used a likelihood ratio and split the preferreds into high and low quality groups depending on whether their observed betas were more likely to be from the preferred or common stock distributions we obtained similar results.

[21]Each preferred stock index contains every security from the appropriate group. Each security carries equal weight in the index.

[22]Each utility preferred is in the high quality preferred category. The distribution of utility preferreds had a mean beta of 0.065 and a standard deviation of 0.039. The non-utility high quality preferreds had a distribution with a mean beta of 0.073 and a standard deviation of 0.049.

[23]Since beta equals the correlation between the risk premium on security j and that on the index multiplied by the standard deviation of security j's risk premiums divided by the standard deviation of the risk premium of the market index beta will decrease with a decrease in the correlation unless the standard deviation the security risk premiums increase sufficiently to compensate for the decrease. In practice, the standard deviation of the security's risk premium does increase. However, this increase is not enough to offset the decline in the betas due to the decline in the correlation.

[24]Several alternative mixes of these assets were tested as possible market indexes. As long as common stock represents a medium to a large portion of the market, the performance of each of the potential indexes was correlated with our chosen market index at levels often in excess of 0.99.

[25]For example, see King (11) Cohen and Pogue (5) and Agmon (1).

[26]A zero correlation may not mean independence. In fact, the market index includes the bond index as a component. The goal of the market index was to approximate the true market index. The low correlation between the market index and the bond index was a coincidental by-produce of the aforementioned goal.

[27]See Miller and Scholes (14) for a more complete discussion of this problem. More theoretical work is needed in this area.

[28]One could argue that the market index is a synthetic variable. However, the results obtained from using the market index and the bond index together as independent variables in multiple regression form are very similar to those expressed in the paper. This suggests that the results are not merely the result of using such a variable.

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