Do Financial Policy Makers Use Financial Theory: The Case of S&L and BHC Merger Regulation

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Abstract

The potential for risk reduction through free market merger activity between savings and loan associations (S&Ls) and bank holding companies (BHCs) in the late 1970's and early 1980's is the focus of this research. Analysis using event study methodology, the efficient portfolio approach of Markowitz (1952), and select financial and accounting performance measures illustrates the potential risk reduction benefits from merger activity between S&Ls and BHCs that existed during the study period.

I. Introduction

The purpose of this research is to investigate the potential for risk reduction through free market merger activity between depository institutions in the late 1970's and early 1980's. The depository institutions specifically investigated are savings and loan associations (S&Ls) and bank holding companies (BHCs). Market-based financial information and reported accounting information available at the end of 1982 both indicate that S&Ls and BHCs could have benefitted from free market merger activity that was suppressed by law.

Pressure for financial institutions to diversify their activities started during the high interest rate environment of the late 1970's and early 1980's. This pressure emanated from the Federal Deposit Insurance Corporation (FDIC) and the Federal Savings and Loan Insurance Corporation (FSLIC). The FDIC and FSLIC became concerned about their ability to deal with increased failures at financial institutions in the period 1978-1982. The Savings and Loan (S&L) industry, in particular, was under severe strain. The revenue on asset portfolios of long-term fixed-rate mortgages could not offset the rising costs of short-term deposit funds.

The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980 and the Garn-St Germain Act of 1982 were designed to specifically address the problems of the troubled financial institutions in the late 1970's and early 1980's. Under DIDMCA, no merger activity was allowed. Under Garn-St Germain, only the FDIC and the FSLIC were permitted to arrange for the acquisition of a closed or failing depository institution. These mergers, intended to halt the rising tide of S&L failures, specifically required the process to be initiated by the regulatory authorities. The acquisitions were very limited in order to control the competitive effect under anti-trust law as discussed by Clemente (1983). Risk reduction through diversification was not an important consideration on the minds of lawmakers, as is evidenced by the results of this research.

Section II reviews the literature. Section III describes the data and methodology. Section IV presents the results. Section V provides a summary, conclusions, and suggestions for further areas of research.

II. Literature Review

Several studies have looked at BHC performance after (ex post) diversification into nonbank assets. Brewer (1990) investigates the association between BHC risk and the composition of nonbank assets such as real estate and insurance. He finds that the proportion of nonbank assets in mortgage banks is negatively related to the variability in return on BHC equity. The Brewer study uses daily stock market data covering a relatively short six-month period ending with the last month of 1986.

Boyd and Graham (1988) perform a simulation study to analyze the profitability and risk associated with

merger activity between BHCs and other financial firms. They find that nonbank activities have limited potential for risk reduction. Like Brewer (1990), Boyd and Graham (1988) use the variability in return on equity as the measure of risk. Both the Brewer (1990) and the Boyd and Graham (1988) studies use an ex post reduction in total risk as a primary hypothesis for merger activity between BHCs and nonbanks. Neither study addresses the ex ante potential for risk reduction through merger activity between S&Ls and BHCs.

When firms merge, they form a portfolio. Portfolio total risk, estimated on an ex ante basis, should be of concern when analyzing merger activity between depository institutions. One of the results of this study shows that the efficient portfolio approach of Markowitz (1952), using market expectations available at the end of 1982, indicates that free market merger activity between S&Ls and BHCs should have been permitted, rather than suppressed, by regulatory authorities. Although individuals can diversify and thus reduce risk in their own accounts, firms can merge to reduce risk and to benefit from synergistic effects such as increased financial slack and investment opportunities (e.g., Myers and Majluf (1984) and Bruner (1988)).[1]

Fraser and Kolari (1990) perform a traditional event study, using weekly data, on the market response of weekly S&L stock prices to the Garn-St Germain Depository Institutions Act of 1982. They find significant positive abnormal returns surrounding the passage of the Garn-St Germain Act, which was signed by the President on October 15, 1982. Their results indicate that investors perceived S&Ls to benefit from this legislation, although which particular aspect of the legislation is left undetermined. Similar results are found by Cornett and Tehranian (1990).

III. Data and Methodology

The focus of an event study is the cumulative excess return to a portfolio over a relatively short period of time. The cumulative excess return is the cumulative equally weighted error terms from some type of market model or return generating process. Event studies, therefore, are only indicative of investor expectations in the short term once the event occurs and should not be used by themselves as a long-term decision making tool. A contribution of the present study is that three separate methods of analysis, including a long-term event study, are employed to examine whether or not S&Ls and BHCs should have been permitted to merge in a free market environment.

The primary hypothesis examined in this project is that merger activity between S&Ls and BHCs was incorrectly suppressed in the late 1970's and early 1980's by the requirement of regulatory authority arrangement. The hypothesis is tested, using the ex ante efficient portfolio approach of Markowitz (1952), by observing the impact of the Garn-St. Germain Act of 1982 upon S&L monthly stock returns using event study methodology similar to that of Fraser and Kolari (1990), but over a longer period of time, and by analyzing changes in financial and accounting-based measures of risk for both S&Ls and BHCs. If the application of fundamental analysis can support the merger of S&Ls and BHCs, using market data prior to deregulation legislation (i.e., ex ante basis) in 1982, then it is argued that free market mergers between healthy S&Ls and BHCs should have been allowed rather than suppressed by deregulation legislation.

Three main sources of data are used: the Annual Industrial Compustat Research File, the Annual Industrial Compustat File, and the CRSP Daily Master File. A significant survivor bias would be present if the data sources were limited to the most recent Compustat files. Those files only contain data for companies currently traded. The Compustat Research and CRSP files contain data for all firms traded over the time period of this study. To limit the data to companies currently traded or to limit the study to a small time frame such as that of Brewer (1990) might misrepresent the picture for S&Ls around the 1978-1987 time period. The entire set of data files is screened for all depository institutions that do not have missing data over this time period. The sample of depository institutions which results from screening the data files for S&Ls and BHCs with continuous data over this period is comprised of 13 S&Ls and 40 BHCs. The 1978 to 1982 time period reflects information that was available to lawmakers at the time of the Garn-St. Germain Act (ex ante decision making information). The subsequent five year period, 1983 to 1987, reflects what actually happened to the portfolio blending opportunities between S&Ls and BHCs as a result of the laws which were passed.

The hypothesis of this research is tested by first observing the cumulative abnormal monthly returns surrounding the enactment of the Garn-St. Germain Act of 1982 to the portfolio of S&Ls. Next, the Markowitz efficient portfolio of S&Ls and BHCs is predicted using monthly return information that is available at the end of 1982. Finally, select financial and accounting performance measures are examined for both the Markowitz and equally weighted portfolios of BHCs and S&Ls over the 1978-1982 and 1983-1987 five-year time periods.

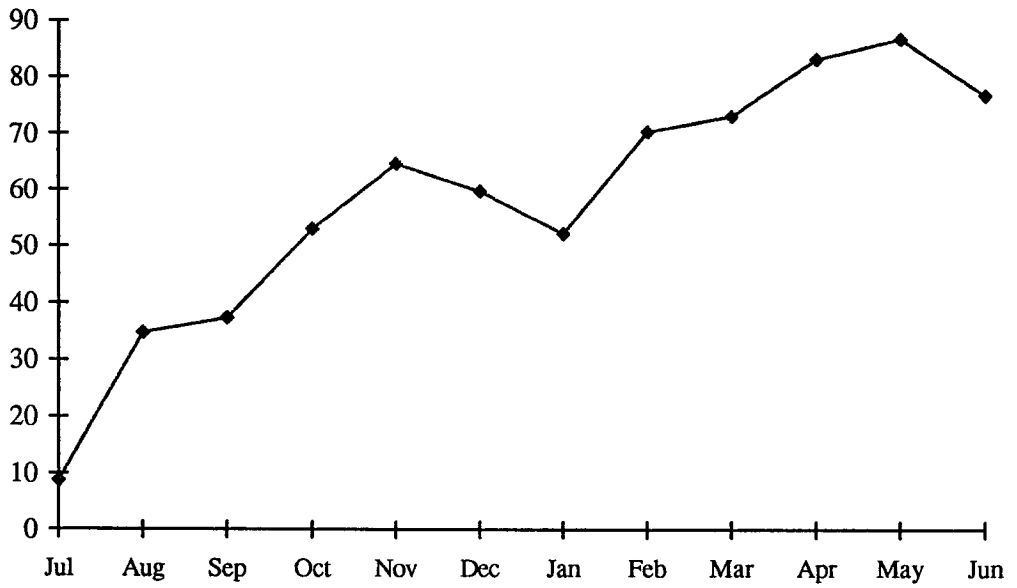
IV. Results

A. Event Study Methodology (1982 time period)

Figure 1 shows the cumulative excess monthly returns for the 13 S&Ls over the July 1982-June 1983 period. The research being used is similar to that of Fraser and

Figure 1

S&L Cumulative Excess Returns 1982-1983



Kolari (1990), but different in two respects. First, monthly returns calculated from the CRSP daily file are used instead of weekly data because a long-term picture of the reaction by the marketplace to the enactment of the Garn-St. Germain Act is desired. Second, both single-factor and two-factor models are used to estimate the cumulative abnormal returns. For the results shown in Figure 1, the following single-factor model is used:

$$R_{pt} = \beta_0 + \beta_1 R_{it} + e_{pt} \quad (1)$$

where

R_{pt} = the monthly return on the equally weighted portfolio of S&Ls;
R_{it} = the monthly return on the Standard & Poor's 500 Stock Index; and
e_{pt} = the error term for the portfolio during month t.

The two-factor model of index and interest rate was also used with similar results.[2]

The parameters of the single-factor model are estimated using the 54-month period preceding the July 1982-June 1983 event window. Table 1 shows the monthly error terms for the portfolio and the t-statistics suggested by Brown and Warner (1980). The results of this event study are consistent with the short-term findings of Fraser and Kolari (1990) in that there are significant positive cumulative abnormal returns preceding the event date. As a decision making tool, this suggests that investors believe that suppressing free market merger activity is not critical to the financial success of S&Ls. However, closer inspection reveals the true nature of event study results. They are strictly short-term and ex post in nature, as evidenced by the cumulative error term starting to decrease by June 1983. The event study method does not address the issue of using available market information for long-term financial decision making.

B. Portfolio Methodology and Financial Performance (pre-1982 time period)

Table 2 lists the composition of MV efficient corner portfolios that result from solving the traditional Marko-

Table 1

Cumulative Excess Returns in Months Surrounding the Passage of the Depository Institutions Act of 1982

	Month	Error	T-Stat		Cumulative Error
1	Jul-82	8.769	1.3283		8.769
2	Aug-82	25.967	3.7438	**	34.736
3	Sep-82	2.641	0.4016		37.377
4	Oct-82	15.682	2.2728	**	53.059
5	Nov-82	11.718	1.7765	*	64.777
6	Dec-82	-4.903	-0.7448		59.874
7	Jan-83	-7.618	-1.1558		52.257
8	Feb-83	18.251	2.7760	**	70.507
9	Mar-83	2.802	0.4237		73.310
10	Apr-83	10.095	1.5038		83.405
11	May-83	3.554	0.5397		86.959
12	Jun-83	-9.906	-1.4970		77.052

S&P 500 last trading day index used

* Significant at the .10 level.

** Significant at the .05 level.

witz model with short sales not allowed over the 1978-1982 period using monthly return data. The Markowitz model identifies a number of corner portfolios that are associated with these securities and completely describe the efficient set. A corner portfolio is an efficient portfolio with the following property: any combination of two adjacent corner portfolios will result in a portfolio that lies on the efficient set between the two corner portfolios. When risk-free opportunities are added to the Markowitz model, the efficient set is a straight line going through the portfolio *T*. This portfolio is known as the tangency portfolio, since it lies at the point on the curved efficient set of Markowitz that is tangent to a straight line emanating from the risk-free rate.

Two of the 13 S&Ls are represented in corner portfolios in amounts that are 10 percent by weight or more. They are Security 4 and Security 13. If the risk-free rate on one-month T-bills is permitted in the Markowitz solution, the tangency portfolio, T82, includes one S&L and two BHCs. The S&L in T82 carries a weight of 37 percent, which is similar to the two BHC weights of 41 and 22 percent.

The analysis was repeated by removing the FIs contained in T82 from the data base. One new S&L and two new BHCs once again entered into the tangency portfolio. This suggests that the S&Ls represent an important component of the Markowitz portfolio of S&Ls and BHCs. The repeated combination of both S&Ls and BHCs in the Markowitz portfolio demonstrates the importance in risk reduction that was known to the marketplace, but not permitted by regulation. If the repeated combination of S&Ls and BHCs were not observed, this would suggest that only a particular or specific few S&Ls were responsible for the portfolio risk reduction observed.[3]

Table 2

1978-1982 Efficient Set of S&Ls and BHCs

Institution Number	Weight in Select Corner Portfolios*				
	3	9	15	21	T82**
4	.35	.19	.00	.00	.37
13	.00	.05	.10	.01	---
17	.00	.05	.03	.00	---
22	.00	.00	.00	.12	---
25	.00	.00	.01	.12	---
28	.00	.00	.12	.14	---
32	.00	.03	.04	.03	---
34	.00	.00	.04	.06	---
35	.00	.06	.18	.18	---
40	.00	.08	.28	.25	---
43	.40	.29	.12	.04	.41
50	.00	.00	.00	.00	---
51	.00	.00	.02	.00	---
52	.25	.25	.06	.05	.22

* There are 25 corner portfolios determined by the Markowitz model.

** Corner portfolio T82 is the tangency portfolio with the one-month T-bill.

Further evidence of the MV efficiency over 1978-1982 of the T82 portfolio is seen in Table 3. The Sharpe and Jensen measures of portfolio performance relative to two benchmark portfolios, the S&P 500 and the Financial Composite Index, are listed.[4]

Both Jensen measures are positive and statistically different from zero for T82. An equally weighted portfolio of the 13 S&Ls, an equally weighted portfolio of the 40 BHCs, and an equally weighted portfolio of all 53 institutions have Jensen measures that are not statistically different from zero. The Sharpe differential measures are positive for T82 relative to both benchmark portfolios, and for the equally weighted S&L portfolio relative to the Financial Composite Index. The Sharpe differential measures for the other equally weighted portfolios are negative. These results empirically demonstrate the ex ante incentive for S&Ls and BHCs to merge, based on market data available prior to 1982, in order to improve the risk-return relationship of financial institutions at the end of 1982.

C. Portfolio Methodology and Financial Performance (post-1982 time period)

The same analysis is conducted over the 1983-1987 time period and the results are presented in Tables 4 and 5. S&Ls do not contribute to the MV efficiency of BHCs over the 1983-1987 time period. BHCs are obviously the MV efficient type of financial institution, providing more return per unit of risk. Even the tangency portfolio, T87, does not contain an S&L when the risk-free rate is introduced. It is important to note, however, that the combination portfolio of S&Ls and BHCs provides more return per unit of risk than the S&L portfolio.

D. Accounting-Based Performance (both time periods)

The accounting measures of performance are:

Net Interest Margin (NIM) Because financial institutions interact in the financial markets by issuing financial

Table 3

Sharpe and Jensen Performance Measures
1978-1982

	Sharpe	Jensen
Tangency Portfolio	.219164 .228700	.0254*(.0095)** .0268*(.0103)
S&Ls	-.003687 .005849	.0027 (.0096) .0040 (.0103)
BHCs	-.207403 -.197867	-.0308 (.0272) -.0299 (.0273)
S&Ls/BHCs	-.144990 -.135454	-.0141 (.0145) -.0130 (.0148)

* Significant at the .05 level.

** Standard error shown in parentheses.

liabilities and purchasing financial assets, one critical element of the financial management of financial institutions is managing the spread, the dollar difference between the interest earned on assets and the interest cost of liabilities. This spread, expressed as a percentage of total assets, is called the net interest margin (NIM): When the spread is negative for an extended period of time, and interest costs actually exceed interest earned on assets, few institutions can make up the difference with other sources of income, and many have failed as a result.

$$NIM = \frac{\text{Interest on Assets - Interest Cost of Liabilities}}{\text{Total Assets}} \quad (2)$$

Riskiness of the NIM Added to the importance of managing the size of the NIM is the problem of managing its riskiness: Both aspects of the NIM, magnitude and variability, must be considered to achieve successful financial performance.

$$\sigma^2_{NIM} = \frac{\Sigma_t \left(\tilde{NIM} - \bar{NIM}\right)^2}{t-1} \quad (3)$$

Table 6 presents the average NIM for both the S&Ls and BHCs over the 1978-1982 and 1983-1987 time periods. The average NIM for S&Ls over 1978-1982 is -1.79 percent with a standard deviation of .96 percent. The average NIM for BHCs is 2.59 percent with a standard deviation of .23 percent. Despite the inferior performance of the NIM measure for S&Ls versus BHCs prior to 1982, it could be deduced from market data that S&Lscontributed to the MV efficiency of BHCs. The NIM measures are stronger for BHCs and weaker for S&Ls over 1983-1987. The average NIM for BHCs increases to 2.91 percent from the 2.59 percent of the previous period, while the average NIM for S&Ls erodes further to -1.82 percent.

V. Conclusions

A principal finding of this research, then, is that the S&Ls entered into the MV efficient portfolios over the 1978-1982 time period, but not over the 1983-1987 time period. Bank holding companies might have recognized a potential for risk reduction through diversification with S&Ls at the end of 1982 and considered merging with existing S&Ls, had regulations permitted mergers. Unfortunately, the DIDMCA and Garn-St Germain Acts did not allow for free market mergers, but did allow for new kinds of lending practices to be undertaken by S&Ls. This led to riskier and untried lending practices that strained some institutions even more than the interest rate and maturity gap problem. Many S&Ls accepted risky commercial loans and real estate loans that later created huge losses and failures. BHCs did not experience the same magnitude of losses as the S&Ls because they had more experience in the commer-

Table 4

1983-1987 Efficient Set of S&Ls and BHCs

Institution Number	Weight in Select Corner Portfolios				
	3	9	15	19	T87**
2	.04	.00	.00	.00	---
13	.00	.02	.00	.00	---
16	.00	.00	.00	.01	---
25	.00	.37	.15	.08	.38
28	.00	.00	.00	.00	---
30	.00	.00	.06	.06	---
34	.00	.00	.00	.02	---
35	.00	.01	.04	.04	---
36	.50	.29	.22	.20	.32
39	.46	.15	.06	.03	.18
44	.00	.00	.31	.38	---
45	.00	.00	.02	.06	---
50	.00	.00	.00	.00	---
51	.00	.03	.00	.00	---
52	.00	.13	.14	.12	.12

* There are 19 corner portfolios determined by the Markowitz model.

** Corner portfolio T87 is the tangency portfolio with the one-month T-bill.

cial loan and real estate markets and could have provided needed expertise and monitoring to S&Ls. The empirical evidence indicates that merger activity between FIs should have been permitted in the late 1970's and early 1980's. S&Ls did contribute to the MV efficiency of BHC portfolios over the time period 1978-1982. Deregulation legislation of the early 1980's should have considered the long-term potential benefits to risk reduction through diversification by allowing merger activity between FIs.

VI. Suggestions for Future Research

The results of this research do not consider merger benefits, such as synergism of management skills, additional experience in commercial and real estate lending, and potential infusion of capital, that BHCs would have provided the S&L institutions. Further research should be directed toward reconciliation of the differences between fundamental financial theory and financial policy. Specifically, financial policy should be evaluated on the bases of risk, return, and performance.

Endnotes

1. An important implication of the financial synergy hypothesis is that the possibility of reducing the cost of capital will be greater when the premerger cost of capital of the acquired firm (S&L) is higher and, in some limited sense, when the cost of capital of the acquiring firm (BHC) is lower. This is likely to be true if the higher cost of capital of the acquired firm results from its (1) greater bankruptcy probability, (2) smaller amount of internal funds, and (3) smaller size. In a merger, the three forces may operate in varying degrees to reduce the capital costs for investments in the acquired firm's industry.

Table 5

Sharpe and Jensen Performance Measures
1983-1987

	Sharpe	Jensen
Tangency Portfolio	.354777 .448870	.0173*(.0045)** .0193*(.0041)
S&Ls	-.090034 .004060	-.0032 (.0103) .0026 (.0101)
BHCs	-.064627 .029467	-.0025 (.0038) .0022 (.0039)
S&Ls/BHCs	-.075478 .018616	-.0029 (.0062) .0024 (.0062)

* Significant at the .05 level.

** Standard error shown in parentheses.

2. The following two-factor model is estimated:

$$R_{pt} = \beta_0 + \beta_1 R_{it} + \beta_2 R_{bt} + \varepsilon_{pt} \quad (4)$$

where

R_{pt} = the monthly return on the equally weighted portfolio of S&Ls;
R_{it} = the monthly return on the Standard & Poor's 500 Stock Index;
R_{bt} = the change in the six-month Treasury bill rate during month t; and
ε_{pt} = the error term for the portfolio during month t.

The parameters of both the single-factor and two factor models are estimated using ordinary least squares (OLS) regression analysis over the 54-month period (t) preceding the July 1982-June 1983 event window. Based on these estimates, the monthly prediction errors during the analysis period are calculated as follows:

$$e_{pT} = R_{pT} - \left(\hat{\beta}_0 + \hat{\beta}_1 R_{iT}\right) \quad (5)$$

for the single-factor model, and

$$\varepsilon_{pT} = R_{pT} - \left(\hat{\beta}_0 + \hat{\beta}_1 R_{iT} + \hat{\beta}_2 R_{bT}\right) \quad (6)$$

for the two-factor model, where T now indicates the test month.

3. It is recognized that the 13 S&Ls may seem to be only a small set on which to base this conclusion. However, as has been stated, they represent the entire population of S&L information available at the time of this study, and they are assumed to proxy for the much larger set of S&Ls that were actually available in the marketplace at the end of 1982.

4. Sharpe's Differential Measure

All combinations of a riskless asset and a single risky portfolio lie along a straight line in expected return-standard deviation space connecting the riskless asset and risky portfolio. The slope of the line is

Table 6

Net Interest Margin

	S&Ls Avg. NIM	BHCs Avg. NIM
1978-1982	-1.79	2.59
1983-1987	-1.82	2.91
	S&Ls σ NIM	**BHCs σ NIM**
1978-1982	.96	.23
1983-1987	.41	.23

$$\left(E\left(\tilde{R}_p\right)-R_f\right)\Big/\sigma_p\,. \tag{7}$$

This ratio is the Sharpe's measure of portfolio performance. If the Sharpe measure of performance for a market proxy is subtracted from that of a portfolio, the result is an estimate of the Sharpe measure of differential return, $\tilde{\xi}_p$, where

$$E\left(\tilde{\xi}_p\right)=0 \tag{8}$$

is the null hypothesis. The Sharpe differential measure for this study is written as:

$$\left\{\left(\bar{R}_p-R_f\right)/\sigma_p\right\}-\left\{\left(\bar{R}_m-R_f\right)/\sigma_m\right\}=\bar{\xi}_p$$
$$H_0:\ E\left(\tilde{\xi}_p\right)=0$$
$$H_1:\ E\left(\tilde{\xi}_p\right)\neq 0 \tag{9}$$

where
$\bar{R}_p$ = average monthly portfolio return.
$\bar{R}_f$ = average monthly rate on a 90 day T-bill.
$\bar{R}_m$ = average monthly market proxy return.

Jensen's Measure

If investors are concerned about the marginal contribution of a portfolio to the risk of the market portfolio and given that the CAPM is the correct equilibrium model, systematic risk should be the appropriate risk measure by which to adjust the portfolio returns for comparison. An empirical formulation of the CAPM can be expressed as:

$$\tilde{R}_{pt}=R_f+\beta_p\cdot\left(\tilde{R}_{mt}-R_f\right)+\tilde{\varepsilon}_{pt} \tag{10}$$

where

$$\beta_p=COV\left(\tilde{R}_{pt},\tilde{R}_{mt}\right)\Big/\sigma^2\left(\tilde{R}_{mt}\right). \tag{11}$$

$\tilde{R}_{pt}$ = time series of monthly portfolio returns.
$\tilde{R}_{mt}$ = time series of monthly market proxy returns.
R_f = time series of monthly rates on a 90 day T-bill

That is, the realized rate of return on a portfolio during a given time period is equal to the riskless rate of return during the period, plus a risk premium that is a function of the security's systematic risk during the period, plus a random error term, $\tilde{\varepsilon}_{pt}$, with

$$E\left(\tilde{\varepsilon}_{pt}\right)=0\,. \tag{12}$$

If the riskless rate is subtracted from both sides, then:

$$\tilde{R}_{pt}-R_f=\beta_p\cdot\left(\tilde{R}_{mt}-R_f\right)+\tilde{\varepsilon}_{pt}\,. \tag{13}$$

The equation written in this manner indicates that the intercept from the regression should equal zero. If portfolios are consistently formed from undervalued securities, the risk premium embedded in their returns will exceed those implied by the risk-adjusted market model. That is, the intercept term will be greater than zero. Let α_p represent the Jensen measure of the average excess incremental rate of

return on the portfolio per unit of time, adjusted for risk. The Jensen measure estimated for this study can then be written as:

$$\overline{R}_p - R_f = \hat{\alpha}_p + \hat{\beta}_p\left(\overline{R}_m - R_f\right)$$
$$H_0: \quad E\left(\alpha_p\right) = 0$$
$$H_1: \quad E\left(\alpha_p\right) \neq 0 . \tag{14}$$

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