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Indications of Risk:
Standard Deviation of Returns or VaR of Terminal Wealth?

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Abstract

Investors with long time horizons are more concerned with the dispersion of their terminal wealth than with within-period volatility of asset returns. The risk of terminal wealth will indicate whether the liquidated value of the portfolio will be sufficient to finance liabilities. In this paper we apply three different strategies to construct portfolios using the historical returns of five asset classes and report their performance over several time horizons. These three investment strategies are: mean-variance optimized portfolios, Roy's safety first rule, and Value at Risk, VaR to minimize the impact of downsize risk when selecting portfolios. The distributions of terminal wealth generated from these portfolios are used to compare these investment strategies.

I. Introduction

A well known benefit of diversification is reduction in the standard deviation of portfolio returns across time. In analyzing portfolio performance, researchers have mainly focused on the probability distribution of annual returns, which is often assumed to be a normal distribution that is described by the expected annual returns and the standard deviation of annual returns. Under this assumption, investor's risk from variation in returns corresponds with the standard deviation of annual returns. As actual returns do not meet this assumption, investors need a more appropriate and useful indicator of risk for constructing investment portfolios.

Even though the focus in investing has been on volatility of returns, Arrow (1964) and Pratt (1964) consider the source of risk being the random terminal wealth or cash payment, not the dispersion of rates of return. Terminal wealth is measured by the expected portfolio value at the end of investment horizon value. Risk is the possibility that terminal wealth will be less than expected. The issue for investors is how to incorporate the impact of this future risk on their current investment decisions.

Over a one year time horizon, the dispersion of terminal wealth and the dispersion of rates of return are similar. Copeland and Weston (1988) using what they call the mean-variance paradox state that investors with specific long term goals and institutions with predefined liabilities such as pension funds and insurance companies are more concerned with the dispersion of terminal wealth from which benefits will be paid. Investors/individuals will rely on the terminal value of their portfolio to convert into a steady stream of income. Therefore, the possibility of shortfall in terminal wealth is a better measure of risk than the time series standard deviation of returns for investors with long-term financial goals. This is not to say that the value of terminal wealth is not affected by the volatility of returns over the investment horizon.

Individual investors with specific long-term and intermediate investment goals such as retirement and college savings are concerned with the expected terminal wealth and its shortfall

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risk, the possibility that the terminal value of their investment will fail to meet its longer term financial goals, rather than in the volatility of the rates of return over the holding period. The risks that the amount accumulated by a retiree is not enough to buy an adequate retirement annuity, the risk that college fund is below the desired level to cover tuition fees at the chosen college. Institutional investors such as pension funds and insurance companies use the terminal value of their portfolio to pay promised benefits. As these investors contemplate that terminal wealth may be less than expected they need a measure of risk that is appropriate and intuitively simple to interpret.

In this paper we use three different strategies to construct portfolios using the historical returns of five asset classes over a seventy-four year time horizon from the 1926-1999 and report their simulated performance over several time horizons. The first investment strategy involves finding mean-variance optimized portfolios with constant quadratic utility. Then use these portfolios in Monte Carlo simulations to forecast the distribution of expected future values from $1 invested today. The second approach involves choosing portfolios based on Roy's safety first rule. The third approach uses Value at Risk, VaR to minimize the impact of downsize risk when selecting portfolios. The distributions of terminal wealth generated from these portfolios are used to compare these investment strategies.

II. Literature Review

The conventional measure of financial risk has been the standard deviation of returns as stated by Markowitz (1952) "the investor does (or should) consider expected return a desirable thing *and* variance of return an undesirable thing." Markowitz was the first to provide a quantitative framework to determine portfolio risk. The investor has to make a tradeoff between risk and return based on utility of wealth along the efficient frontier.

Another influential paper on portfolio theory was by Roy (1952). Roy's purpose was to find the best risk return tradeoff without having to specify a utility function. Roy's safety-first criterion, given by the following expression:

$$Roy\ Safety = \frac{E(R_p) - R_l}{\sigma_p}$$

Where $E(R_p)$ is the expected portfolio return, R_l is the lowest return required by the investor, σ_p is the standard deviation of portfolio returns. In a minimum-variance framework, for each portfolio, calculate the Roy safety first ratio then pick the portfolio with the highest ratio. The investor will choose the portfolio with the lowest probability of going below the lowest return tolerated. In essence, Roy's measure is the first recognition of shortfall risk. In implementing the Roy's safety-first measure, a decision has to be made about the minimum acceptable rate of return. If risk-free rate is substituted for minimum acceptable rate, then the Roy's measure becomes the Sharpe ratio. For the purpose of our analysis we apply this rule to the change in terminal value. The investor seeks to at least preserve the principal invested.

Alternatively, to measure the shortfall risk, the risk that the value of the portfolio will fall below some minimum acceptable level at the end of the planning horizon, a new measure was adopted, the value at risk or VaR. VaR was first developed by financial institutions as a measure of total risk for internal control in the 1980s. This new measure of risk has gained increasing

acceptance, and has been adopted by banks, security firms, and asset managers as a tool for risk assessment. VaR assumes that we have a portfolio that generates a random return over a chosen horizon. Essentially, VaR measures the minimum loss on a portfolio given small probability over a specific time horizon. Though VaR does not require any assumptions about the distribution of returns, its implementation requires choosing a horizon period and a confidence level. These values are usually arbitrary. It is a common practice to set the confidence level at 95%. Jorion (2001) says "… VaR systems will bring about better control and management of financial risks". Further, Jorion states "…VaR provides a simple, transparent, and consistent measure of overall risk." VaR has become widely used as it allows comparison of risk across different portfolios and measures "lost money" the easiest measurement unit.

Despite its popularity, VaR has its critics. A loss more than VaR, even though its probability may be very small, is not captured by VaR, i.e., there is no indication what that loss maybe. Basak and Shapiro (2001) show that in the worse states of the world, the VaR users may take on more risk and consequently increase the stock market volatility. The disparity of these claims calls for an empirical exploration.

III. Data and Simulation

To estimate the value of terminal wealth and its distribution, we consider three investment strategies using historical returns of five asset classes: small stocks, large stocks, long-term T-bonds, intermediate T-bonds, and T-bills over a seventy-four year time horizon from the 1926 to the 1999. Mean-variance efficient portfolios for alternative levels of risk tolerance are created from the five asset classes. Efficient portfolios have maximum expected return at every level of standard deviation of returns. The allocation of $1 invested among the five asset classes is determined by the mean-variance framework. Selection among efficient portfolios is determined by maximizing a quadratic utility function defined by the following: $U= E[r]-0.5A\sigma^2$. The coefficient A measures the degree of risk aversion taking the following values: 1, 2, 4, 8, and 16. The strongest risk aversion is associated with the largest value of A. This gives us a historical perspective of diversified portfolios over varying time horizons (t=1, 3, 5, 10, 20).

From these efficient portfolios, for chosen levels of investor risk aversion, we use Monte Carlo simulation of optimal rates of return to estimate the distributions of expected terminal wealth for each time horizon. The expected value of terminal wealth is calculated as the average of the 10,000 simulations. Investors' goal is to achieve high terminal wealth, with reduced risk measured by standard deviation of annual rates of return.

The above simulation is based on the returns generated from optimized portfolios using the mean- variance framework with the underlying assumption that the returns are normally distributed. To conduct an analysis that is distribution free, we performed a bootstrap procedure for constructing portfolios to reduce downside risk by using Roy's safety first ratio and the VaR measure. Boostrapping generates a probability distribution of returns under the assumption that returns are equally likely. For example, we simulate 20-year sample of possible returns by sampling 20 randomly selected returns from the 74-year historical returns. The twenty-year returns are compounded to obtain a terminal wealth for the 20 year holding period return. This procedure was repeated 10,000 times to generate a probability distribution of returns for t years

(t=1, 3, 5, 10, 20). We use two methods of selecting optimum portfolio weights for each asset class for each time horizon that minimize downside risk of terminal wealth.

The first method uses Roy's safety first rule applied to the change in terminal wealth. We assume the reference level is the initial wealth level. The change in terminal wealth is divided by the standard deviation of terminal wealth. By maximizing this ratio, we minimize the probability that the expected terminal wealth will be lower than initial wealth.

The second method uses VaR measured at two probability levels, 1 percent and 5 percent. VaR is the percentile of the distribution of change in terminal value which represents the change in terminal wealth. For example, 1 percent VaR of $10 is interpreted as the decrease in terminal wealth will be by no more than $10 with a 99 percent confidence level. By choosing optimum portfolios based on VaR, investors minimize the downside risk to terminal wealth.

IV. Empirical Results

The purpose of this study is to compare indications of risk from standard deviation of annual returns and value of VaR by estimating the terminal value of wealth from different investment strategies. Panel A Table 1 reports summary statistics of the historical rates of return for the five asset classes from 1926-1999 used to generate simulated mean-variance efficient investment portfolios as shown in figure 1 and optimum portfolios that minimize downside risk using Roy's safety first rule and VaR measure.

The five asset classes are small stocks, large stocks, long term T-bonds, intermediate T-bonds, and T-bills. Small stocks have the highest rate of return and highest standard deviation and T-bills have the lowest rate of return and lowest risk supporting the notion that investors require higher rates of return to bear risk. The difference between average return on small stocks and average return on large stocks is equal to 5.7 % yet the standard deviation of small stock returns is almost double the standard deviation of large stock returns. There is a strong positive correlation between the returns of small stock returns and large stock returns.

Panel B Table 1 shows portfolio annual rates of return for several levels of risk aversion including the minimum variance portfolio. These mean-variance efficient portfolios have expected returns varying from 4.19% to 15.92% with respective standard deviations of 3.14% to 28%. The minimum variance portfolio has the lowest Sharpe ratio as expected. For higher values of A (more risk averse investors), the Sharpe ratio is lower. The Roy safety-first ratio uses zero as reference rate, and is increasing with the degree of risk aversion. Figure 1 illustrates the risk return tradeoff of the mean-variance efficient portfolios.

Table 2 reports the distribution of terminal wealth simulated from the minimum variance portfolios and optimal mean variance for a coefficient of risk aversion set at 16 over several time horizons (t= 1, 3, 5, 10, 20). Among all possible mean variance optimal portfolios, we selected these two conservative investment strategies as they have risk return tradeoffs similar to the other portfolio strategies. The minimum variance portfolio is the most conservative strategy with low return and low risk. The mean variance optimal portfolio with a coefficient of risk aversion of 16 has a large penalty of risk as measured by the standard deviation of annual returns. This portfolio has a small standard deviation of change in terminal value of wealth.

The third panel on Table 2 presents the distribution of terminal wealth for the optimal portfolios using Roy's safety rule applied to the change in terminal wealth. Roy's safety first uses initial wealth as the reference value. This preservation of wealth is a conservative goal which results in a conservative investment strategy. These portfolios have risk-return tradeoffs that fall between those of the minimum variance and conservative investment strategies shown in the first two panels. Compared to the other strategies, the Roy's safety first rule has the portfolios with lowest terminal wealth in the last time horizon.

The fourth panel reports the optimal portfolios that minimize the downside risk using a 1 percent VaR for each time horizon. This procedure selects portfolios that reduce the probability that the change in terminal wealth will be less than expected which makes a very conservative investment strategy. The 1 percent VaR portfolios have a risk return tradeoff similar to the minimum variance portfolios in the time horizon t=1, 3, and 5 years. For the other time horizons, the 1 percent VaR portfolios have increasing standard deviation a substantial increase in skewness which is reflected in a much higher change in terminal wealth by restricting downside risk but allowing large gains.

The fifth panel shows the optimal portfolios that minimize the downside risk using a 5 percent VaR for each time horizon. By comparison to the 1 percent VaR, these optimal portfolios are more conservative. For the time horizons t=1, 3, and 5 the optimal portfolios using 1 percent VaR and 5 percent VaR are fairly similar. On the 10 and 20 year horizons the 5 percent VaR portfolios depict an increasing skewness which adds to increase in terminal wealth.

V. Conclusion

Sufficiently reducing the dispersion of terminal wealth is of direct relevance to investors with fixed long-term obligations and/or savings goals. This study uses three investment strategies to estimate terminal wealth over five different time horizons. Investment strategies focused on reducing downside risk result in conservative portfolios. Over short time horizons, all three investment strategies simulated in this paper yield similar conservative low risk and low return performance. Over the long time horizons such as 10 and 20 years, the investment strategy based on value at risk, VaR, allow positive skewness which increases expected terminal wealth. Overall, we find the use of VaR of terminal wealth to minimize downside risk results in similar portfolio performance as a risk averse investment strategy minimizing the standard deviation of annual returns.

Figure 1 Efficient Frontier

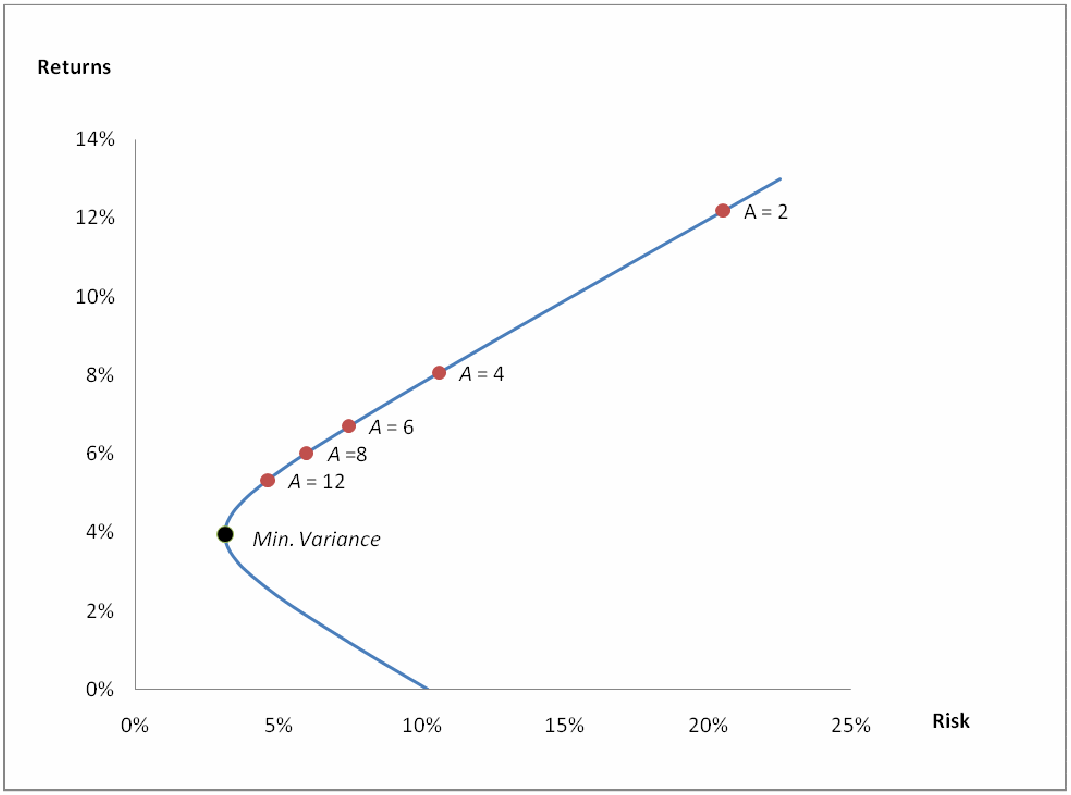

Table 1
Panel A

Sample Statistics 1930-1999

	Small Stocks	Large Stocks	Long-Term T-Bonds	Intermediate-Term T-Bonds	T-Bills
E[*r*]	18.81%	13.11%	5.36%	5.19%	3.81%
St Dev	39.41%	20.08%	8.06%	6.33%	3.27%
Minimum	-52.71%	-45.56%	-8.74%	-5.81%	-1.59%
Maximum	187.82%	54.56%	32.68%	33.39%	14.95%
Correlations					
Small Stock	1.00	0.78	0.01	-0.02	-0.17
Large Stock		1.00	0.20	0.15	-0.03
L-T T-Bonds			1.00	0.78	0.26
I-T T-Bonds				1.00	0.43
T-Bills					1.00

Panel B
Rates of Returns Risk Measures

Portfolio	Expected Rate of Return	Standard Deviation of Return	Expected Utility	Sharpe's Ratio	Roy's Safety First Ratio
Minimum Variance	4.19%	3.14%	*N/A*	0.119	1.335
$A = 16$	5.60	4.35	4.08%	0.410	1.287
$A = 8$	7.05	6.80	5.21	0.476	1.038
$A = 4$	9.54	11.69	6.81	0.490	0.816
$A = 2$	13.46	20.74	9.15	0.465	0.649
$A = 1$	15.92	28.08	11.97	0.431	0.567

Table 2
Statistics of Portfolio Terminal Wealth

Portfolios created by minimizing standard deviation of annual rates of return.

	1 year	3 year	5 year	10 year	20 year
E[ΔV]	0.042	0.131	0.228	0.507	1.271
σ of ΔV	0.032	0.059	0.083	0.143	0.308
First Quartile of ΔV	0.021	0.091	0.171	0.409	1.060
Second Quartile of ΔV	0.042	0.130	0.225	0.500	1.255
Third Quartile of ΔV	0.063	0.170	0.284	0.599	1.468
Skewness of ΔV	0.026	0.114	0.131	0.269	0.391

Portfolios created by minimizing standard deviation of annual rates of return with risk aversion coefficient of 16 and expected utility of 4.08%.

	1 year	3 year	5 year	10 year	20 year
E[ΔV]	0.056	0.178	0.313	0.724	1.973
σ of ΔV	0.043	0.084	0.122	0.227	0.557
First Quartile of ΔV	0.027	0.121	0.229	0.567	1.576
Second Quartile of ΔV	0.057	0.176	0.309	0.714	1.928
Third Quartile of ΔV	0.086	0.233	0.395	0.868	2.320
Skewness of ΔV	-0.053	0.172	0.216	0.368	0.610

Portfolios created by maximizing Roy's Safety First Rule applied to change in terminal wealth.

	1 year	3 year	5 year	10 year	20 year
E[ΔV]	0.048	0.147	0.248	0.526	1.208
σ of ΔV	0.034	0.065	0.090	0.157	0.312
First Quartile of ΔV	0.027	0.100	0.183	0.413	0.987
Second Quartile of ΔV	0.045	0.141	0.241	0.515	1.177
Third Quartile of ΔV	0.066	0.188	0.307	0.628	1.397
Skewness of ΔV	0.431	0.390	0.393	0.447	0.535

Portfolios created by using 1% VaR to reduce downside risk to change in terminal wealth.

	1 year	3 year	5 year	10 year	20 year
E[ΔV]	0.043	0.136	0.249	0.654	3.512
σ of ΔV	0.032	0.062	0.094	0.244	4.035
First Quartile of ΔV	0.019	0.091	0.182	0.482	1.662
Second Quartile of ΔV	0.038	0.130	0.241	0.624	2.413
Third Quartile of ΔV	0.063	0.175	0.308	0.784	3.868
Skewness of ΔV	0.841	0.564	0.538	1.058	6.392

Portfolios created by using 5% VaR to reduce downside risk to change in terminal wealth.

	1 year	3 year	5 year	10 year	20 year
E[ΔV]	0.044	0.152	0.281	0.789	8.367
σ of ΔV	0.039	0.069	0.116	0.398	9.307
First Quartile of ΔV	0.014	0.104	0.199	0.533	3.131
Second Quartile of ΔV	0.038	0.146	0.270	0.716	5.622
Third Quartile of ΔV	0.065	0.195	0.351	0.951	10.305
Skewness of ΔV	1.382	0.477	0.690	2.575	4.154

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The Financial Performance of SRI Excluded Firms

Thomas Berry and Joan Junkus

Abstract:

Socially Responsible Investments (SRI) can be characterized as 'negative screening': investors eliminate certain firms from consideration based not on perceived performance but on inappropriate behavior (labor issues or support of same sex unions for example) or for products considered inappropriate for society (alcohol and tobacco for example). There have been a large number of studies examining the effect of this negative filter on investment performance, but little research on the operational impact on a firm of being systematically excluded by SRI investors. This paper examines what financial consequences, if any, occur if a firm is excluded by a large number of SRI funds. We find that debt ratios, profit margins, operating costs, and cash positions of SRI-excluded firms are affected. These excluded firms tend to use more debt, hold higher cash positions, and have higher profit margins and lower operating costs than similar, non-excluded firms.

I. Introduction:

Socially Responsible Investing (hereafter SRI) is an area of increasing interest in the investment community. While the SRI concept has been traced to the early 1900's (Sauer 1997), the largest growth appears to have occurred in the 1990's with these funds reaching about $2 trillion (Stone 2000). As of 2005, approximately 10% of new investment dollars were committed to SRI funds. Very broadly, SRIs can be characterized as 'negative screening', i.e. investors eliminate certain firms from consideration based not on perceived performance but on inappropriate behavior (labor issues or support of same sex unions for example) or for products considered inappropriate for society (alcohol and tobacco for example). The most common of these negative filters are alcohol, tobacco, and gambling, but the restrictions run a wide gamut including: labor relations, adult entertainment, animal testing, bio-ethics, diversity, human rights, military, environmental issues, etc.[1]

There have been a large number of studies which have examined the effect of this negative filter on investment performance. There is little research, however, on the impact on a firm of being systematically excluded. If a firm is excluded by a large number of SRI funds, what are the financial or operational consequences, if any? Perhaps the market is large enough or unconcerned enough that there is no impact on excluded firms, or perhaps these firms have a risk premium for these perceived socially inappropriate behaviors and products. Our study will examine these questions.

We begin by examining the financial characteristics of SRI-excluded firms relative to a portfolio of comparable firms over a twelve year period (1995-2006). We restrict our selection of excluded firms to those involving the most common categories of

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1 Some funds consider themselves 'inclusionary" by including firms that meet certain socially acceptable criteria, but the effect is the same.

perceived socially inappropriate behavior; alcohol, tobacco, and gambling. We compare a portfolios of firms from these narrowly defined industries with a portfolio containing firms from a broader industry category (for tobacco, food; for alcohol, beverages, and for gambling, hotels). The specific restricted firms examined are those included in the SIN-dex, a traded index which includes firms in the alcohol, tobacco, and gambling industries. The SIN-dex is a traded index with firms specifically chosen to be 'anti-SRI' hence we felt this would be a representative group for our purpose.

The focus of the vast majority of empirical work on SRI firms is on stock valuation and SRI investment performance. The results overall are mixed. While a meta-analysis of SRI investment results finds that there is a positive relation between individual firm financial performance and SRI characteristics (Orlitzky, Schmidt, and Rynes 2003), SRI mutual funds—those that use SRI characteristics to screen stocks and construct optimal portfolios--do not appear to perform differently than non-SRI funds (nor do they out- or underperform the market (see Bollen 2007)). SRI indexes—averages of companies highly rated along some dimension of SR (environmental, human rights, etc.)—have been shown to outperform the S&P500, but not in every sub-period (Statman 2006).

Very few studies have addressed the linkage between firm characteristics and SRI measurements. Murphy and Verschoor (2002) summarize a Business Week study that found that the top 100 ethical firms (chosen by Business Ethics magazine) had higher short-term sales and profit growth and higher profit margins than the remaining S&P500 firms. While Spicer (1978) found that US pulp and paper firms with better pollution control records had higher profitability, these results were not replicated in a study by Chen and Metcalf (1980). Hong and Kacperczyk (2007) find that leverage is significantly higher for a broadly defined set of 'sin' companies than for other publicly traded US firms, but other financing-related firm characteristics are not significantly different. But event studies clearly show that news concerning a firm's environmental policies is incorporated into its stock valuation (see Derwall, Guenster, Bauer and Koedijk 2005), indicating that SR behavior can have an effect on market perceptions.

II. Methodology and Data:

One difficulty with testing issues related to SRI behavior relates to the vast array of definitions of SRI behavior (see Hemley, Morris and Gilde 2005 and Statman 2005). The definition of 'socially responsible' firms and actions is a very broad one, and can include such issues as products (nuclear weapons, alcohol), the production process (pollution, labor practices), choice of suppliers (sustainable agricultural production), and a vast array of other issues (apartheid, bribery, tax evasion, shareholder activism, nature conservancy). In addition, investors can choose simply to exclude non-SRI firms from their portfolio, actively invest in firms with positive SRI policies (Ben and Jerry's), or seek to use their shareholder status to force a change in firm behavior (e.g., blocking animal testing at cosmetics companies, or forcing divestment in Burma). There is also a multiplicity of SRI agencies to score a company's SRI rating (for US stocks, KLD Research and Analytics (developer of the Domini 400 Social Index), Dow Jones Sustainability Group; for European securities, Ares, NPI Social Index for the UK, etc.). For maximum clarity, we focus on a narrow, clear, and generally well accepted set of

companies, namely alcohol, tobacco, and gambling; a triad of industries that form the basis of the International Securities Exchange's SIN-dex (http://www.iseoptions.com/), an index of thirty firms in these industries. These industries figure prominently in contrarian vice-investment literature (Ahrens 2004 and Wexler 2004). The Social Investment Forum lists 106 SRI mutual funds and the various factors that compose them. Of the 106 funds, 89 ban tobacco firms, 76 ban alcohol firms, and 72 ban gambling firms. The next highest category for funds is the banning of military related firms which was 36 funds. Hong and Kacperczyk (2006) have found that institutional investors hold these particular types of non-SRI companies in smaller proportions than their market weight.

Our interest is in contrasting firms typically excluded or restricted from SRI portfolios relative to similar non-restricted firms. Our sample of restricted firms consists of the 30 firms comprising the SIN-dex, which contains 15 gambling firms, 9 tobacco firms, and 6 alcohol firms. The firms included in the index are listed in Table I. For the SIN-dex firms we collected quarterly balance sheet and income statement data for each firm over the period 1995-2006 and constructed portfolios for each group.

For comparison portfolios we used the largest industry which contained the SRI-excluded firms as a subgroup. For example, the tobacco firms are contained in the food industry, alcohol in the beverage industry, and gambling in the hotel industry (the majority of revenue in gambling comes from resort/hotel venues). We constructed the comparison industry portfolios by deleting the SIN-dex firms (plus any others from the tobacco, alcohol or gambling industry) from each broad industry group and then computing the industry average data for each industry, again on a quarterly basis for the period 1995-2006. All data is from Compustat.

III. Results:

How are corporate characteristics affected by SRI concerns? Three avenues of influence are possible. First, if investors in sufficient numbers limit purchases of stock in 'sin' companies, then a firm's SRI behavior will be felt in those areas related to this inability to attract equity investment. (See Heinkel, Kraus, Zechner 2001 for a model that indicates that a reasonable threshold for investor ability to affect corporate performance is 20%.) Thus, if equity financing is hard to come by, sin companies should have higher leverage ratios (D/TA). If financing is difficult for these firms, they can be expected to hold higher levels of cash and securities (as a percentage of total assets).

A second avenue for SRI effects on firm characteristics is through firms' cost structures. In very general terms, non-SRI (sin) firms have fewer restrictions on their actions, and so correspondingly lower costs. However, we are focusing exclusively on three particular 'sin' industries, and so address specific cost components that would be affected by the peculiarities of these sin industries. Since 'sin sells', one would expect that sin companies would need to spend less as a percentage of sales revenue on advertising their product. On the other hand, with the continuing threat of legal and regulatory action against their products, sin companies would be expected to have much higher legal expenses. To examine the impact on cost structure, we compare operating expenses (as a percentage of sales). In addition, sin companies may choose to keep more

cash on hand in order to cover these expenses, so again they would be expected to have higher cash and marketable securities than comparable firms.

A third avenue of influence relates to firm profitability. Since a sin product can be expected to have a relatively low price elasticity, a sin company should have a relatively high profit margin. In addition, spending on these kinds of products should be less affected by recessionary pressures, and so profit margins should remain unaffected by economic cycles compared to comparable firms.

We test these hypotheses by calculating the average debt, cash and marketable securities balances, operating expenses, and net income for both our 'sin' portfolios and the comparable industries. Both debt and cash are normalized by total assets and expenses and net income are normalized by sales. Due to the fluctuating nature of these accounts we took averages over the entire time series allowing for forty-eight observations for each porfolio. The results of these overall 12-year average comparisons are given in Table II. All the variables show the hypothesized direction with the exception of the debt ratio for alcohol firms.

As to the behavior of profit margins over time, the time series of the data supports our general hypothesis (see Charts 1, 2, and 3). The 'sin' companies have higher profit margins on average and appear to be less sensitive to the economic downturns of the late 1990's and the 2001-2 period, but more data is required to confirm these trends.

IV. Conclusions:

Since some firms are considered socially undesirable, they are systematically excluded from a growing number of funds. These 'sin' firms are examined to see if they possess financial characteristics which would be consistent with firms in this situation. In particular we examine the debt ratios, profit margins, operating costs, and cash positions of these firms. Our hypotheses are widely supported and show that there is an impact which is detectable, namely that these firms tend to use more debt, hold higher cash positions, have higher profit margins, and lower operating costs than otherwise similar firms.

There remain a number of questions for future research. We suspect that one reason for the higher profit margins is that the 'sin' firms are less vulnerable to business downturns and thus are better able to weather downturns in the business cycle. While there are no official recessions during the time period we examined there is some evidence that the 'sin' firms performed better during down markets. This question needs further analysis. In addition there are questions of corporate governance and executive compensation that can be addressed. For instance, sin firms might be expected to pay proportionately higher compensation in order to attract managerial talent to what might be considered a 'shunned' industry. As the popularity of SRI funds grows, these and other important questions will prove to be important areas of inquiry.

Table I: Firms included in the SIN-dex

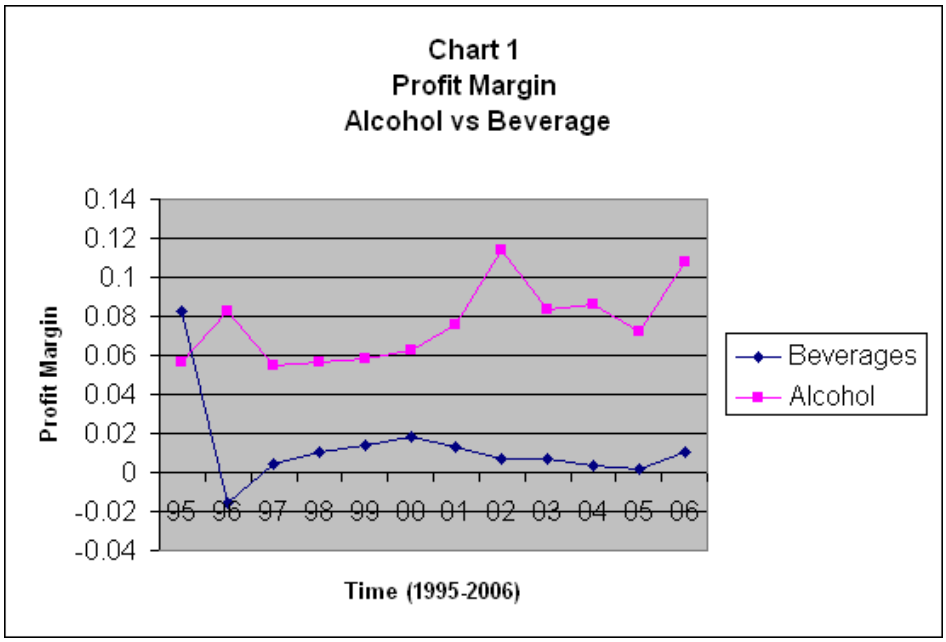
Symbol	Name
ABV UN	AmBev -PN (ADR)
AOI	Alliance One International Inc.
ASCA	Ameristar Casinos
BF.B	Brown-Forman Corp.
BTI UA	British American Tobacco (ADR)
BUD	Symbol
BYD	Boyd Gaming Corp.
BYI	Bally Technologies Inc
CEDC	Central European Distribution
CG	Loews Corp. - Carolina Group
DEO UN	Diageo (ADR)
IGT	International Game Technology
ISLE	Isle of Capri Casinos Inc
LVS	Las Vegas Sands
MCRI	Monarch Casino & Resort
MGM	MGM Mirage
MO	Altria Group, Inc.
MPEL	Melco PBL Entertainment Macau Ltd.
PENN	Penn National Gaming Inc
PNK	Pinnacle Entertainment
RAI	Reynolds American Inc.
SGMS	Scientific Games
SHFL	Shuffle Master
STZ	Constellation Brands
TAP	Molson Coors Brewing Company
UST	UST Inc.
UVV	Universal Corp.
VGR	Vector Group
WMS	WMS Industries
WYNN	Wynn Resorts Ltd

Table II

Means for selected financial characteristics for 'sin' portfolios and the Industry Comparables for the period 1995-2006

	Debt	Cash and Securities	Operating Expenses	Net Income
Alcohol N = 6	.391	.128	.820	.077*
Beverages N = 12	.407	.0961	.882	.035
Tobacco N = 9	.699*	.219*	.804*	.091*
Food N = 56	.318	.125	.864	-.01
Gambling N = 15	.621*	.149	.769*	.056*
Hotel N = 17	.544	.124	.842	.017

* = Significantly different at the 5% level



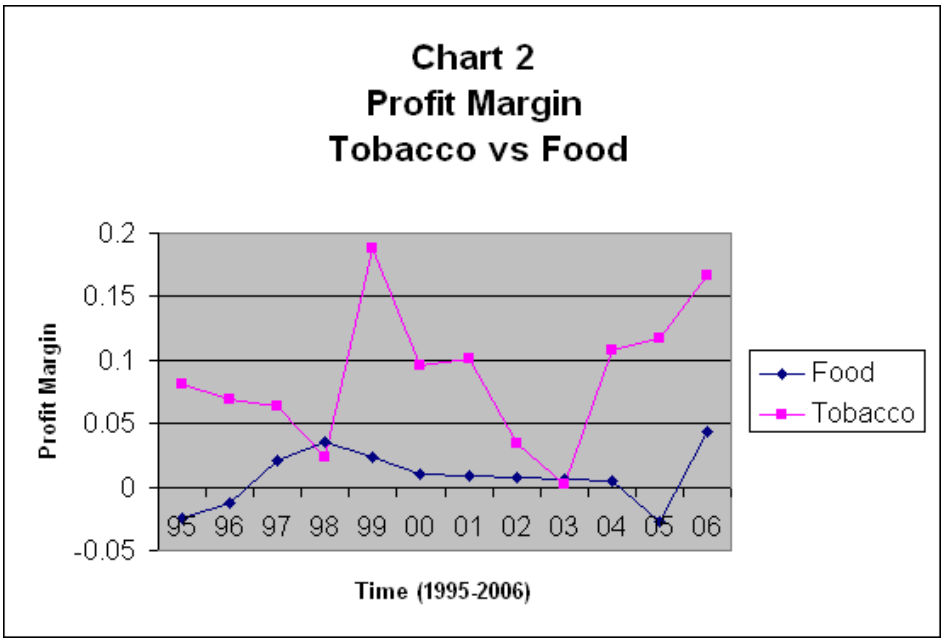


Chart 2
Profit Margin
Tobacco vs Food
0.2
0.15
0.1
0.05
0
-0.05
Profit Margin
95 96 97 98 99 00 01 02 03 04 05 06
Time (1995-2006)
Food
Tobacco

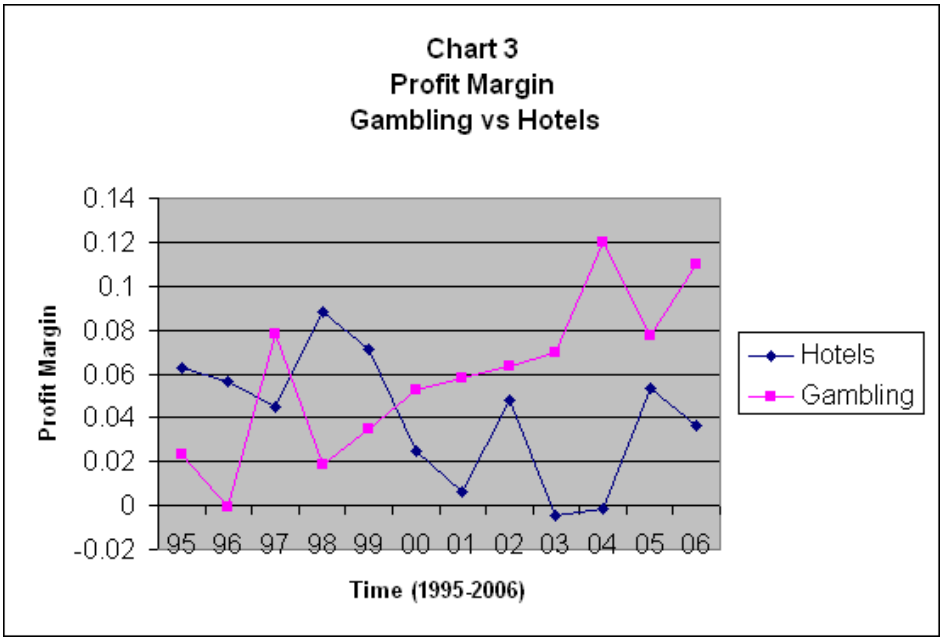


Chart 3
Profit Margin
Gambling vs Hotels
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
-0.02
Profit Margin
95 96 97 98 99 00 01 02 03 04 05 06
Time (1995-2006)
Hotels
Gambling

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Group Think in Financial Analysis? A Multivariate Study

Robert L. Webster

Abstract

This multivariate behavioral research investigates if financial assessments made by analysts may be affected by the professional employment group or sector in which the analyst works. Professional financial analysts from two separate groups were studied. The two groups were analysts for state public service commissions who regulate the public utilities industry and professional private sector analysts who specifically follow stocks and bonds of public utility companies. Members of both groups were asked by way of a mailed survey to analyze multi-year comparative financial statements of a publicly traded electric utility company using variables related to liquidity, long term debt, cash flow, dividends, profitability, as well as the overall financial condition of the firm. The paper describes the data collection process, statistical analysis, and results of the research.

I. Introduction

Statement of Financial Accounting Concepts No.1 promulgated by the Financial Accounting Standards Board (FASB, 1978) established that the overall purpose of financial reporting is to give external users information that will enhance their ability to analyze financial information and make business and economic decisions. Accordingly, effective financial reporting should meet the following three broad objectives: (1) information must be useful in making investment and credit decisions, (2) information must be useful in assessing cash flow prospects, and (3) useful information concerning the resources of enterprise resources, claims to those resources, and changes in resources must be provided. (FASB, 1978).

The financial reporting objectives are derived from the informational needs of external users. These users lack the authority to prescribe what information they want and what format such desired information must take (SFAC No. 1, 1978); therefore, they must rely on the information communicated by management.

The FASB recognizes that there are many potential groups of financial information users and that financial reporting must attempt to satisfy each group simultaneously. Over the years, a number of studies have questioned whether or not current systems of financial reporting meet the needs of diverse user groups. Abdel-khalik (1971) proposed that the informational needs of users are dynamic and therefore subject to change over time. Hendriksen (1982) pondered how we can be sure that current disclosure rules meet the informational needs of users. Johnson (1992) questioned if informational needs of users might not differ according to user group affiliation.

This research investigates the affects of user group differences when performing financial analysis of a firm using a set of comparative financial statements. The research specifically

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seeks to determine if one's professional employment group affiliation affects the financial statement user's analysis of the financial condition of a business enterprise.

II. Literature Review

In the specific domain of financial analysis, Johnson (1992) postulates that financial informational needs may differ by user class. Elliott and Jacobson (1994) express the belief that financial disclosure will change in the future, most likely, with the amount of disclosure increasing to meet differing user group needs. Wallman (1995) expresses concern that current financial reporting is not keeping pace with changes in business and may not meet the objective needs of users in the future. McEwen and Hunton (1999) catalog that differing sets of analysts focus on different aspects of reported financial information. Hendriksen and Van Breda (1992) postulate that various user groups may hold to differing objectives in financial reporting, and by extension, view the same financial information differently. Johnson (1992) goes so far as to question if differing user groups do not in fact have differing financial information needs.

Different users/user groups may arrive at different interpretations from identical financial information. It seems plausible that differences in analysis, if existent, could reasonably be based upon one's professional employment position or affiliation. Scott (1997) supports this line of logic in his findings that individual analysts and groups are not unanimous in the reaction to financial accounting information. Makhail, Walther, and Willis (1999) detail that analysts following large, intensely watched firms often arrive at varied analytical conclusions concerning the financial condition of a firm. Webster, Ellis and Bryan (2004) found that male and female analysts differ somewhat in their analysis and in their confidence in their analysis.

This research seeks to add to the body of literature by testing if professional employment affiliation is a significant factor in assessing the financial condition of a firm. The research does not attempt to measure if the analysis performed by a specific professional employment group is superior to another, but concentrates on whether or not differences in outcomes of analysis exist between members of separate professional employment groups.

III. Problem Statement

It is not known if the assessment of the financial condition of a firm may be affected by the professional employment group of the analyst. The purpose of this study is to test whether financial analysis differs between professionals employed in different sectors of the profession. In the research, one group of analysts work in the regulatory setting (public service commission analysts) and the other group work in the for profit sector of the economy (securities analysts that follow publicly traded utility companies).

Sources of Data

The data collected for this study consisted of responses to a mailed questionnaire applicable to an actual but disguised set of comparative financial statements of a publicly traded utility company. The financial statements contained comparative balance sheets, income statements and cash flow statements. The financial statements were from a regulated utility

company that had no nuclear exposure and low exposure to any acid rain legislation. A utility was chosen because accounting practices and methods are more standard in this business sector than most any other. Standardization in financial statement preparation was sought in order to reduce the number of variables the participants would encounter. The response instrument provided for an assessment of the financial condition of the company in six categories (detailed later).

The survey packet was mailed to 250 professional users of financial statements. There were 125 members targeted in the survey from two different professional groups. The two groups were professional securities analysts (referred to from here on as analysts) and public service commission analysts (referred to as regulators from here on). Survey participants were selected at random from two sources. The regulators were selected from a listing of public service financial analysts compiled from documents of various state publications. The professional securities analysts were selected from the membership of the New York Society of Security Analysts. Of the 250 survey packets mailed, 65 usable responses were returned, for a response rate of 26 percent. Of the 65 responses, 33 were from the securities analysts and 32 were from the regulators. The survey response instrument is presented at the end of the paper.

After compilation of the returned surveys, potential nonresponse bias was investigated. Larson and Catton (1959) demonstrated a now commonly used proxy to test for nonresponse bias. Using their general methodology, models were constructed to test for differences between early and late respondents in each group. No statistically significant differences were found between the early and late responders. Additionally, Berdie (1989) found that even in the event of nonresponse bias in mail surveys, typically the bias did not alter survey findings.

Null Hypothesis

H_0: A statistically significant difference does not exist in the financial analysis between public service commission financial analysts and professional private sector securities analysts who follow the utilities industry in assessing the financial condition of a publicly traded utility firm.

IV. Design of the Study

The design for this study was one in which a categorical independent variable was measured in order to evaluate its effect on six metric (scaled) dependent variables. The independent class variable was the professional employment group of the responder (either financial analyst or utility regulator).

The six scaled dependent variables (described below) were measures of the respondents' assessments of the firm's future abilities or future financial conditions. These measurements were obtained from respondent scores in the six areas using a seven point Likert scale for each of the six variables. On the scale, one indicated a very low ability rating of the firm and seven indicated a very high ability rating.

The dependent variables were chosen after a review of the financial analysis literature which indicated that analysis should, as a minimum, incorporate measurements of liquidity, both short and longer terms, profitability, and cash flow. (Strong, 2001); (Hirt and Block, 2003); (Besley and Brigham, 2005); (Moyer, McGuigan, and Kretlow, 2006). Additionally, Kolb and DeMong (1988), Mayo (2000), as well as Bodie, Kane, and Marcus (2001), indicate that much of the analysis performed on a firm is done by persons external to the firm, and these analysts must make use of existing financial statements. All authors cited immediately above assert that these parties are most interested in liquidity, profitability, and cash flow. These writers also agree that in addition to assessing individual financial areas, a combined assessment of the entity should be made prior to reaching a conclusion concerning the overall well being of the firm. The dependent variables were therefore chosen to incorporate the consensus of thought concerning important aspects of financial analysis utilizing financial statements.

Description and Methodology of Analysis

The data were analyzed by using Multivariate Analysis of Variance (MANOVA). MANOVA is concerned with differences between groups or experimental treatments. MANOVA is termed a multivariate statistical procedure as it is used to assess group differences across multiple dependent metric variables simultaneously (Hair et al, 1998).

MONOVA is deemed particularly useful when employed in conjunction with an experimental design in which the researcher controls and manipulates one or more independent variables to determine the effect on two or more dependent metric variables (Hair et al, 1998). Additionally, MANOVA does away with the problem of a series of individual F-tests (which may lead to increased type 1 errors) by testing the linear combination of all dependent variables simultaneously.

In the study, the six dependent variables are metric variables based upon a scaled input. The use of scale based metric variables is a common practice and is demonstrated and supported by Hebert and Freeman (1992), Hair, Anderson, Tatham, and Black (1998), and Johnson and Wichern (1998). The six dependent variables are listed below along with the independent class variable.

The Research Model

$Y_{jk} = U + Aj + Ej_k$

where:

Y_{jk} = the vector of responses for each rating category item (6 items) from a participant k in group j.

U = overall or grand mean effect.

A_j = effect of level j of factor A (user group) on the six response items for j=1,2.

Ej_k = random error present in response k in cell j, for i=1,2,...nj.

Practically stated, the model was as follows, with the shortened titles of the variables listed for use in subsequent tables and figures.

$$Y_1, Y_2, Y_3, Y_4, Y_5, Y_6 = X_1 \text{ where:}$$

Y_1 = Assessment of the ability of the firm to meet its short-term obligations as they come due.
Y_2 = Assessment of the ability of the firm to meet its long-term obligations as they come due.
Y_3 = Assessment of the ability of the firm to continue paying its current cash dividend in the future.
Y_4 = Assessment of the ability of the firm to increase its common stock cash dividend in the future.
Y_5 = Assessment of the ability of the firm to increase its profitability in the future.
Y_6 = Assessment of the over-all future financial condition of the firm.
X_1 = Employment group. (Financial analyst, Utility regulator)

V. Results

Table I shows the results of the multivariate test of the null hypothesis. The results demonstrate that there is a statistically significant difference between the analysis of the regulators and the private securities analysts. The exact F Value was computed to be 3.453. The significance of the F Value was 0.019, an indication of a distinct difference in the overall analysis of the two groups. The observed power of the F-test was .842.

Table II displays the mean assessment scores reported by the analysts and regulators for each of the six dependent variables. The table also shows the results of the *post hoc* univariate analysis performed. This analysis was undertaken to determine which if any of the individual dependent variables were significant and to determine if only one or two or the variables were instrumental in affecting the outcome of the MANOVA test. As can be seen from the table, the regulators had higher mean scores in each of the six areas of assessment. In four of the six areas, the differences between the mean scores of the two groups were statistically different at the 0.10 level. These *post hoc* results demonstrate that the MANOVA results were not overly influenced by only one or two of the six assessment variables. This adds support to the overall finding of the model. Additionally, it is of particular interest that there is a statistically significant difference at the 0.036 level between the mean scores of the two groups for the variable measuring the over-all future financial condition of the firm. This single variable may well be, in the minds of the respondents, a summary variable that describes the over-all assessment of the firm, as both analysts and regulators would focus on the future conditions of the enterprise.

VI. Summary of Findings and Discussion

The results of the multivariate analysis (MANOVA) showed that there was a statistically significant difference in assessment results of the regulators and the securities analysts. These results are in consonance with the current literature suggesting that differing user groups may draw different conclusions from identical financial information. The separate ANOVA performed on each of the six dependent variables yielded results that showed the regulators had higher mean scores than did the analyst for all six variables. Four of the six variables were significantly different at the 0.10 level. These individual results generally support the multivariate findings and indicate that the multivariate findings were not skewed by only one or two of the six variables. The research indicates that the general purpose financial statements

required by the FASB may convey somewhat different information to the two studied user groups.

Objective analysis should be accomplished without bias. But, is this possible? In the current research it would seem the each group of users brings its own forms and methods of analysis to the task. This is likely to happen as each group may have differing objectives in performing their analysis. Such is not particularly surprising however, as often times in other professions two professionals see the same facts but view them differently. For instance in the court room, the prosecution and the defense are at opposite ends of the opinion spectrum although they are dealing with the same case and the same facts. Securities analysts often vary in their opinions of the value of a stock although presented with the same information. In the current research it may be useful to conclude that analysis is affected by one's professional employment group even when such other variables such as education and experience are taken into account. In other words, "group think" may impact analysis.

The findings are however limited and preclude projection to the larger population due to a relatively small sample. Additionally, correlation between the dependent variables, although the use of such variables is called for in the financial literature, may also limit the findings. Additional research should be undertaken to determine if other variables such as gender, experience, age, and ethic background may affect financial analysis.

TABLE I
MANOVA RESULTS FOR HYPOTHESIS OF NO DIFFERENCE IN ASSESSMENTS BETWEEN REGULATORS AND ANALYSTS

Wilks Lambda	Exact F Value	Significance of F
.703	3.453	0.019

TABLE II
MEANS AND *POST HOC* ANOVA RESULTS FOR HYPOTHESIS OF NO DIFFERENCES IN FINANCIAL ASSESSMENTS BETWEEN ANALYSTS AND REGULATORS (7 POINT SCALE)

Variables	Analysts n=33	Regulators n=32	F- test	Significance of F
Ability of the firm to meet its short-term obligations	4.94	5.48	3.341	.073
Ability of the firm to meet its long-term obligations	4.61	4.91	1.050	.310
Ability of the firm to continue paying current cash dividend	4.73	4.74	.001	.972
Ability of the firm to increase cash dividend in the future	4.03	4.54	3.106	.098
Ability of the firm to increase profitability in the future	3.61	4.26	5.278	.035
Overall assessment of the future financial condition of the firm	3.91	4.57	5.306	.036

FINANCIAL STATEMENT ANALYSIS
SURVEY RESPONSE SHEET

For each of the six items below, please record your response by circling one of the numbers for each of the six questions. Indicate your assessment of the company based upon your review of the enclosed Financial Statements.

Response Scale: WEAK/LOW 1 2 3 4 5 6 7 STRONG/HIGH

CIRCLE YOUR LEVEL OF ASSESSMENT FOR EACH ITEM

1. Ability of the firm to meet its short term obligations as they come due.
   1 2 3 4 5 6 7

2. Ability of the firm to meet its long term obligations as they come due.
   1 2 3 4 5 6 7

3. Ability of the firm to maintain its current cash dividend on common stock.
   1 2 3 4 5 6 7

4. Ability of the firm to increase its cash dividend on common stock in the future.
   1 2 3 4 5 6 7

5. Ability of the firm to increase its level of profitability in the future.
   1 2 3 4 5 6 7

6. The overall future financial condition of the firm.
   1 2 3 4 5 6 7

COMMENTS: If you would like to make any additional comments, please do so on the back.

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Does Investing in Interim-Terms Pay Dividends?

Lise Graham and Thomas Krueger

Abstract

Interim-term course offerings are becoming more common as universities attempt to respond to student demand for courses outside the traditional semester time frames and to more fully utilize their resources (both faculty and facilities). One of the concerns with these courses is that the compressed time frame may compromise student learning, in terms of both learning within the course and knowledge retention. This paper considers these issues by comparing the performance of finance majors enrolled in the principles course in an interim session with that of students taking this course in a traditional term. For students in our study, we find that there is no statistical difference in the two groups' performance within the principles class itself or in the subsequent courses required of all finance majors.

I. Introduction

The University of Wisconsin-La Crosse has offered undergraduate courses during interim sessions (January and May) since 1995. Offering courses during these time intervals allows administrators to maximize course availability, instructors to obtain additional income, and students the chance to catch up on courses, take courses which otherwise would not fit into their program, or get a head start on the next semester. It appears to be a win-win-win situation for all of the parties involved.

But is it? Are students learning as much as they would during a semester-long class? Krueger (2002) reports that a majority of students taking J-term courses felt that they had sufficient time between instruction periods to master the material. Fewer than ten percent of the students felt they had gotten less out of the J-term experience than out of a normal semester-long course.

Despite these opinions, the true value of interim session courses is still debatable. Some argue that, without effective study habits, students may be unable to handle the unique challenges arising from the focus required to do well in a concentrated learning course. Others claim that students simply do not have enough time to fully understand the information presented in these compressed time formats. Conversely, some argue that the intensive, single-course immersion results in greater long-term benefits. A faculty committee at the university was charged with evaluating these abbreviated classes to ensure they do not compromise student education. Gauging the value of interim terms thus becomes a significant assessment issue.

As Finance faculty, one of our concerns was that those students who completed the principles course in an interim session not be at a disadvantage relative to those who completed a traditional course. To examine this, we compared the performance in subsequent courses of students taking Principles of Financial Management in an interim term with that of students taking this course in a traditional term. In our curriculum, Principles of Financial Management is the prerequisite for Corporate Finance, Investments, and Financial Institutions, which are in turn prerequisites for the capstone course, Problems and Cases in Finance. An analysis was also made of additional characteristics that could impact the relative ability to benefit from interim offerings, including gender, prior grade point average, and university experience. With over 500 students that had completed interim-session finance courses at the time of the study, although a majority of them were not finance majors, we now had a sufficient sample to contrast the

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performance of these finance majors in subsequent courses to those that had taken prerequisites during traditional semester periods.

Assessment is critical in the educational environment, regardless of accreditation concerns. Faculty members attempt to enhance their performance and verify that efforts are paying off in the form of improved student understanding. The results of this research have provided critical input to decision making regarding the proper format of the College of Business' interim-term offerings. In addition, since interim-term courses are taught in most disciplines, the results are of interest to a wide array of academic professionals.

II. Literature Review

The relationship between time and learning is uncertain. Given that human development and the acquisition of knowledge take place over time, time may be a necessary, but not a sufficient, condition of learning. Furthermore, effort or "time on task" is probably a critical determinant of learning. Krueger (1993) refers to this phenomenon as a "motivation effect" and finds that students employed for less than ten hours per week do better than unemployed students. At higher employment levels, a "substitution effect" reduces study time and class grades.

Most published studies of the relationship between time and learning have focused on weekly hours of study time without regard to course length. Both Schmidt (1983) and Gleason and Walstad (1988) find that total study time is unrelated to course achievement. Specifically, Gleason and Walstad's (1988) findings do not support the hypothesis that there exists a student perception of an inventory of study time that is then consciously allocated among courses in order to maximize overall GPA.

In economics education, Murphy (1979) compared pre-course and post-course scores on the Test of Understanding College Economics (TUCE) for enrollees in a two-week summer institute to a national TUCE norming group in semester-long courses and found no difference. Research began to address the relationship between course length and student learning in the 1980s. Course intensity and duration variables are positive and negative an equal number of times in Watts and Lynch's (1989) study of 2,800 economics students at Purdue University. Watts and Lynch also find that more committed students sign up for the intensive "Maymester" education format more frequently. Grimes and Niss (1989) compared the learning of students that watched two *Economics U$A* videos a week to a control group with only one exposure and a discussion session. Although students in the multiple-video class studied more per week, across the course the control group studied more. Grimes and Niss found no significant difference in student performance on standardized tests. Furthermore, Van Scoyoc and Gleason (1993) mention several institutional studies showing that students in intensive summer sessions enrolled in various subjects have performed at least as well as those who took the course during the regular term at Indiana University, the University of Minnesota, and the University of Nebraska.

One of the biggest steps forward was Van Scoyoc and Gleason's (1993) analysis of economic learning in courses that were largely identical except for course length. As with the current study, they compared a 3-week "term" where students met five times a week for three hours each day and a more traditional 14-week semester where students met twice a week for one and one-half hours. Van Scoyoc and Gleason's dependent variable was the post-course TUCE test, while the independent variables included pre-course TUCE test, pre-course GPA, pre-course credits, gender, student age, instructor, and session length.

These variables were able to explain one-third of the variation in post-course TUCE scores. As expected by Van Scoyoc and Gleason, the regression coefficients on GPA and pre-course TUCE variables were positive and significant. An unexpected result was that the gender term was significant, with male students learning more than women. In their study, the 3-week students did 10.5 percent better than the 14-week students. In a test of grades in the economics course, Van Scyoc and Gleason find better grades among students with higher GPA, higher pre-course TUCE scores, and those taking the course during the abbreviated time period.

More important than end-of-course performance is information retention. To assess retention, Van Scyoc and Gleason gave the TUCE test to students at the beginning of their intermediate economics course. Once again, prior GPA, course grade, and student gender were significant. However, the number of prior credits and the length of time since the economics course were not significant. Also, most importantly, the regression coefficient on the length of the principle's course term was insignificant, suggesting that students taking the 3-week course retain knowledge from the principles of economics course as well as the 14-week students do.

Despite its importance and relevance to university calendars, Van Scyoc and Gleason's research has seldom been cited. In a subsequent test of economic literacy, Gleason and Van Scyoc (1995) find that adult males remember more economic information than females, but unfortunately do not question whether the adults had learned economics in traditional or concentrated teaching environments. Lage and Treglia (1996) cite Van Scyoc and Gleason's (1993) gender findings and demonstrate that the difference between male and female performance is reduced by including the latest scholarship on women in the economics course.

Only a few articles in the finance literature have analyzed the teaching interval's impact on knowledge retention. The Spring 2002 issue of Research for Educational Reform (Krueger, 2002) published results of a survey of student perceptions regarding the January term. Approximately eighty percent of the students taught during J-term felt that they had sufficient time between instruction periods to master the material. A plurality of students with an opinion, including three that felt they had insufficient time to master the subject matter, felt they got more out of the J-term class than out of a normal semester's course. Only ten percent of the students felt they had gotten less out of the J-term experience than out of a normal semester-long course.

This is the first study of success in concentrated interim terms in the finance discipline. The present study improves upon Krueger's efforts in several ways, including:

- focuses on finance majors, who have the most to lose through experiencing a poor teaching environment in the principles course,
- examines actual performance, not perceived performance,
- considers performance before, during and after the principles course,
- looks at a variety of other factors beyond course duration that could influence student performance,
- has a much larger sample size, and
- considers an updated time period.

III. Methodology

The study examines the performance of finance majors who graduated in the time period spanning May 1998 through May 2005. This time period was chosen because the first time

students graduated who had been enrolled in a May or January-term finance course was in May 1998. Two hypotheses were tested:

> H_1: Finance majors who take the principles course in interim sessions will exhibit the same performance (as measured by grades) as those finance majors who take the course in traditional sessions.

Although students are taking the course in a more compact time frame, the total number of hours in the classroom (3 hours per day x 5 days per week) is equivalent to a typical 15-credit full time load. Consequently, there was no reason to expect that the first null hypothesis would not be supported.

> H_2: Finance majors who take the principles course in interim sessions will exhibit the same performance in their major courses (FIN core) as those students who complete the course in a traditional semester.

Every principles course at the university is required to offer 770 minutes of instruction (approximately 14 hours) per credit, whether taught during a traditional or interim time period. In addition, our department has worked hard to ensure that we teach with the same learning objectives in mind and do not compromise on our expectations or requirements. Furthermore, students have indicated that they reduce their outside commitments in order to have more hours of study time per day. Consequently, there was no reason to expect that the second null hypothesis would not be supported.

IV. Results

Comparison of Student Grades

The first hypothesis investigated the performance differences of the finance majors in the principles class itself. Population characteristics are detailed in Table 1. Approximately ten percent of the finance majors in the study had taken advantage of the interim offerings of Principles of Financial Management. A 1994 Department of Education monograph summarizes a variety of studies by stating that most, but not all, research concludes that "grades are related to cognitive development and academic learning" (Gardiner, p.66). Comparison of each of the grade-related rows of Table 1 suggests that learning is very similar across the two samples.

A t-test for difference in means was done for each of the above variables, with the null hypothesis that the mean was zero. In each case, the observed differences were statistically insignificant. In other words, finance students who enrolled in the interim sessions and those who enrolled in traditional offerings had, on average, the same grade point average at the time they enrolled in the principles course. Unlike Watts and Lynch's (1989) findings, there does not appear to be a tendency for better students to sign up for interim classes. Unlike Van Scyoc and Gleason (1993), we do not find better performance of students during the interim class.

Analysis of Subsequent Student Performance

Even if student performance is similar across the duration of their principles course, there may be different factors influencing their academic performance. To investigate the impact of several variables, the second hypothesis was tested using the following regression equation:

$$\text{FIN CORE GPA} = \beta_0 + \beta_1 \text{ INTERIM} + \beta_2 \text{ GRADE} + \beta_3 \text{ GPA} + \beta_4 \text{ CREDITS} + \beta_5 \text{ FEMALE}$$

The dependent variable, FIN CORE GPA, was the average of the student's grades in the four courses comprising the core of the finance major – Corporate Finance, Investments, Money and Capital Markets, and the capstone class, Problems and Cases in Finance. INTERIM was a dummy variable that equaled 1 if the student completed the principles class in a compressed time format (either a January or May interim session) and 0 otherwise. GRADE was the student's grade in the principles course, while GPA was the student's cumulative grade point average at the time he or she enrolled in the principles course, as measured on a four-point scale. CREDITS referred to the number of credits the student had earned prior to enrolling in the principles course. Finally, FEMALE was a dummy variable with a value of 1 if the student was female, 0 otherwise. This variable's inclusion arose from the importance of gender in several of the reviewed articles.

Because the primary concern of the study was whether students who took the interim courses performed as well in their subsequent finance classes as those who enrolled in more traditional offerings, the coefficient for the dummy variable INTERIM was of most interest in this equation. A significant negative coefficient would indicate that students who completed such courses performed below those who completed a traditional length course; a significant positive coefficient would indicate a higher level of subsequent performance for students completing an interim course.

The results of the regression are set forth in Table 2 below. The R square of 0.557 means that 55 percent of the variation in the finance core grades was explained by the independent variables in the equation. The F-statistic of 72.96 was significant at the 0.01 level.

The coefficients for the students' principle course grade (GRADE) and cumulative grade point average prior to taking the course (GPA) were both positive and statistically significant at the 0.01 level. This indicates that a student's general academic achievement level and the performance in the principles class are directly related to student performance in the subsequent classes. The dummy variable coefficient for the interim sessions was positive, but not statistically significant. Although the interim variable's sign is consistent with Van Scyoc and Gleason's finding that interim students perform better, the difference found here is insignificant. The coefficient for the number of credits earned prior to enrolling in the principles class was not significant, perhaps because most finance majors take this course as soon as they are eligible to do so, in order to satisfy the prerequisite requirements of the later courses. Finally, gender does not appear to be significant in influencing performance in the remainder of the finance core classes.

V. Summary

The principles course in finance serves two purposes: It is the foundation for the remainder of the finance major and it provides non-finance majors with the basics of financial management. There has been concern that students enrolled in compressed time sessions are receiving a less rigorous course and that the level of learning may be less than that in traditional 14-week semesters. If so, it might disadvantage those students relative to their peers in terms of their ability to be successful in the subsequent classes. After examining the performance of finance majors in the core finance classes for this time period, it appears that there was no difference in grades in the subsequent required finance classes between those who complete the compressed time principles courses and others.

Table 1. Sample size and grades across educational time frames

	Finance Majors Enrolled in Interim Terms	Finance Majors Enrolled in Traditional Terms
Total students	27	250
Average Pre-Principles GPA	2.976	3.009
Average Principles grade	2.963	2.954
Average FIN core GPA	3.089	3.075

A t-test for difference of means found no statistically significant differences in the above GPAs.

Table 2. Regression Results

Regressors	Intercept	Interim	Grade	GPA	Credits	Female
Coefficient	0.7066***	0.0239	0.3025***	0.4798***	0.0004	0.0114
t-statistic	3.6960	0.2988	7.9824	7.1252	0.2356	0.2311
	$R^2 = 0.557$		F-statistic = 72.96			

Asterisks denote level of significance using the following scale:
*** = .01 ** = .05 * = .10

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Mutual Funds with Hedge Fund Characteristics:
Diversification Benefits and Costs

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Abstract

Hedge funds claim higher returns with lower risk and low correlation with the U.S. stock market, albeit at a higher cost than alternative investments. This paper examines the corresponding properties of mutual funds that employ hedge fund type strategies. Results show that mutual funds in the Morningstar long-short category, compared to a matched mutual fund samples, have slightly lower total returns but higher risk-adjusted performance measures based on lower risk statistics. Lower beta and R^2 for the long-short funds highlight their main benefit as a portfolio diversifier. Expense ratio and turnover costs are higher for long-short funds.

I. Introduction

The poor performance of the stock market since March 2000 highlights the benefits of the "market neutral" strategy employed by many hedge funds. As a result an increasing number of traditional mutual funds began to seek greater flexibility from their investors to employ strategies that mimic those of their hedge fund competitors (Laise, 2006). New mutual funds recently launched specifically to replicate hedge fund methods prompted Morningstar to create a separate "long-short" category in 2006, which contained 51 funds in 2007 (after controlling for multiple classes of the same fund).

The category has existed long enough for an examination of the performance characteristics of the mutual funds employing hedge fund strategies listed in the long-short category and a comparison of the performance of these funds to mutual funds that are similar based on the funds stated objective in their prospectus, the equity style box category created by Morningstar, and size as measured by total assets.

Results indicate mutual funds employing hedge fund strategies generate lower three-year returns, higher three-year alphas and lower Sharpe ratios than comparable funds. The long-short category has lower risk (beta and standard deviation) which improves its risk-adjusted performance (alpha and Sharpe). Lower R^2 and beta highlight the comparatively low correlation of long-short funds and their potential diversification benefits. Those benefits are offset by higher turnover rates and expense ratios than comparable funds.

II. Literature Review

This section discusses hedge fund characteristics and details the diverse types of strategies included under the long-short category of mutual funds. Following the rapid expansion in hedge fund investing during the nineties, a large volume of academic literature explored various aspects of the industry including performance, risk, risk-adjusted performance, and costs. The persistence of hedge fund performance is examined by Agarwal and Naik (2000) and Malkiel and Saha (2005). Survival rates of hedge funds are detailed by Brown, Goetzmann, and Park (2001) and Liang (2000). Our study builds on the literature that focuses on the risk-adjusted performance of hedge

fund strategies. Articles by Liang (1999) and Ackerman, McEnally, and Ravenscraft (1999) study the performance of hedge funds and compare that performance to mutual funds using data that ranged from 1988 to the late nineties. Liang finds that hedge funds do provide significant systematic risk reduction benefits, as evidenced by beta coefficients that were significantly below 1.0 when returns were regressed on the S&P 500 index. The funds did not completely neutralize market risk, however, as the betas were also significantly above zero. The study employs Sharpe ratios to compare the risk-adjusted performance of hedge funds with that of mutual funds for the period 1992-1996. The Sharpe ratio is defined as,

$$\frac{(R_i - R_{rf})}{\sigma_i},$$

where R_i is the return on the fund, R_{rf} is the risk-free return as measured by short-term treasury bills, and σ_i is the standard deviation of the fund's return. The results show that hedge funds outperformed mutual funds on a risk-adjusted basis, with hedge funds producing an average Sharpe ratio of 0.44 compared with 0.26 for the mutual funds. This difference was significant at the 1 percent level. Ackerman et al. find similar results using 2-, 4-, 6-, and 8-year samples all ending in December 1995. The average Sharpe ratio for hedge funds is 21 percent higher than that for comparable mutual funds. Our study employs the Sharpe ratio to assess whether the long-short category of mutual funds has produced similar risk-adjusted performance.

We also use Jensen's alpha (α) as a risk-adjusted performance measure controlling for the fund's systematic risk, as estimated by the following regression of excess fund return on expected return given the risk premium of the benchmark index, $(R_m - R_{rf})$, and the fund's estimated Beta (β):

$$R_i - R_{rf} = \alpha + \beta(R_m - R_{rf}).$$

Beta (versus standard deviation) measures the risk contribution to a diversified portfolio of assets and long-short portfolios are seldom, if ever, recommended as a large percentage of an investor's portfolio. Thus, alpha is an appropriate risk-adjusted performance measure for the long-short category.

The long-short category broadly defines a diverse set of strategies that seek to neutralize the effect of the direction of the overall stock market on portfolio returns. The most common of these strategies are characterized as "market neutral" and "equity variable long-short". The market neutral approach utilizes long and short positions of roughly equal value to neutralize the impact of the overall market direction. As such, a key selling point of long-short funds is their ability to provide returns that exhibit substantially lower correlation with the broad market, greatly reducing portfolio systematic risk and enhancing measures of risk-adjusted performance. In addition to offering risk reduction benefits, the manager seeks to purchase undervalued shares and short overvalued shares with similar market correlations, thus providing the opportunity to earn strong returns in both up and down markets. Alternatively, a more conservative strategy is to short a market index rather than attempting to identify specific overvalued securities for short sale. The equity variable long-short strategy also uses short sales to enhance returns. However,

unlike the market neutral approach, managers of these funds may move from a net long or short position to take advantage of their expectation for the direction of the market.

Other funds categorized by Morningstar as long-short utilize other popular hedge fund strategies. For example, in merger risk arbitrage, the manager may go long the stock of the target firm and short the stock of the acquiring firm, with a larger position in the target if the manager believes the deal is likely to be consummated. Distressed debt and equity investing is another example of an event-driven strategy that may be included in long-short investing, where managers attempt to take advantage of market imperfections that require the sale of these securities by certain institutional investors. Global macro investing involves taking long and short positions in various asset classes including stocks, bonds, currencies, commodities and their derivatives, with an emphasis on relative valuation across national economies and markets. While relatively new, the long-short category encompasses a variety of investment strategies and techniques (Norton, 2008).

The alternative strategies involved in long-short investing also result in differences in fund structure and costs. The methods described above employ transactions that are usually limited by mutual fund bylaws. These include the use of short sales, leverage, and derivative contracts on equities, debt, currencies and commodities. These funds may also invest in illiquid securities. Existing funds seek approval from their investors to allow managers to more fully utilize these techniques. Long-short strategies may also result in significantly higher costs to investors. Maintaining the market hedge can require higher portfolio turnover, resulting in increased trading costs and taxes. In addition, these funds typically have higher expense ratios associated with their more aggressive management style (Kinnel, 2003). Similarly, hedge funds are often cited for high costs for their investors (Cassidy, 2007).

III. Data and Methodology

Morningstar created a separate long-short category in its Principia database in 2006. The category contained 51 funds in 2007 after controlling for multiple share classes of the same fund (A shares are employed when available). Twenty-five of the 51 funds had at least three years of return data and those 25 funds make up the long-short portfolio. The performance characteristics evaluated include three-year total return, three year alpha, Sharpe ratio, three-year beta, three year R^2, three year standard deviation, turnover ratio, and the audited expense ratio (see http://search.morningstar.com/Glossary/Glossary_Q_S.html for a description of all the statistics). All data is taken from the Morningstar Principia database with data updated through January 31, 2008.

To find comparable mutual fund portfolios the Principia database was searched using three criteria that matched funds in the long-short portfolio: prospectus objective, equity style box, and size by total assets. Each fund in the long-short category was matched with three funds selected as comparable based on the above criteria. One of the comparables for each fund was randomly selected without replacement for inclusion in a portfolio and three comparable portfolios of 25 funds each were constructed. The risk and return measures for all four portfolios are calculated on an equally weighted basis. Results detail the statistics cited above for the long-short portfolio, the three comparison portfolios, and an aggregate comparison portfolio

composed of the entire comparison sample (75 funds). This allows for analysis of the variability inherent in the comparison sampling process.

IV. Analysis and Results

Table I presents the data for eight measures used to compare long-short mutual funds with hedge fund characteristics, parsed by the 25 fund sample of long-short funds, the three 25 fund comparison mutual fund samples, and an aggregate sample of all 75 comparison funds. Performance measures (three-year returns, alpha and Sharpe) indicate that the long-short mutual funds have a lower three-year return (5.75% versus 7.47%, 7.39% and 7.6%) and lower Sharpe (.14 versus .32, .35 and .36) but a higher alpha (.41% versus -.48%, -.43% and -.04%). Alpha is a risk-adjusted performance measure that uses beta as a risk measure, thus it's best used when the mutual fund is expected to be a smaller percentage of an investor's diversified portfolio. Since the Sharpe uses standard deviation as its risk measure, it is more applicable when the mutual fund is expected to be a larger percentage of an investor's portfolio. Because no reputable financial advisor would recommend that long-short mutual funds be held as a large percentage of an investor's portfolio, alpha is the more appropriate risk-adjusted performance measure for this category. Taken together, performance results show that the lower three-year return for the long-short category is more than compensated for by a lower beta (see below) and that the long-short category is a reasonable investment as a portfolio diversifier, held as a smaller percentage of an investor's portfolio.

Correlation and risk measures in Table I (R^2, beta and standard deviation) also highlight the role of the long-short category in reducing overall portfolio risk. R^2, the coefficient of determination, measures the percentage of the change in the mutual fund that can be explained by changes in the S&P500 stock market index, so lower R^2s indicate lower correlation with the overall stock market. The long-short category R^2, 31%, is much lower than all of the comparison sample R^2s (74.6%, 75% and 77%). The average standard deviation of the long-short category is also lower than the three comparison samples (6.3% versus 10.3%, 10.26% and 10.3. Beta measures the contribution to the risk of a well-diversified portfolio and the average beta is one by definition. Most telling, the long-short category beta (.34 versus 1.09, 1.06 and 1.07) indicates that the long-short category has much less than average risk when held as a smaller percentage of a diversified portfolio.

Table I also details cost comparisons for the long-short category versus the three comparison portfolios. Turnover represents the total amount of buy/sell transactions compared to the total assets held by a fund and thus proxies for transactions costs incurred by fund investors. The long-short category turnover, 280%, is considerably higher than the three comparison samples (78%, 83% and 72%). The audited expense ratio contains all the year-by-year charges as a percentage of total assets, including the 12b-1 and management fees. The long-short category expense ratio of 1.95% is higher than each of the three comparison samples (1.21%, 1.27% and 1.17%). Results also show average load/deferred load for long-short category is .90/.43. By comparison, the large blend category is .76/.57, midcap blend .76/.50, and small blend .72/.46. There is some evidence that long-short funds have relatively higher front loads and smaller deferred loads. Overall, this evidence shows that the high cost of hedge fund investments is mirrored in the long-short mutual fund category.

ANOVA tests show that the long-short sample mean was significantly different from the three comparison portfolios at the .01 level for beta, R^2, and standard deviation (all lower than the comparison portfolios), and audited expenses and turnover (higher). The three-year return, alpha and Sharpe were not significantly different. Overall, results show that long-short category returns are slightly below comparison funds, a fact mitigated by the lower risk and correlation of the category, especially when these funds are held as a smaller percentage of a diversified portfolio. The cost of this portfolio diversification is higher average turnover charges and expense ratio.

Table II presents year-by-year total returns from 1998-2007 for the long-short category, big stock (S&P500) and small stock (Russell 2000) market indexes, and selected Morningstar mutual fund categories (the same 3 X 3 matrix discussed above). Its results are highlighted by the long-short category's lowest annual standard deviation (8.9%) and low downside potential (only one negative year, -1.5% in 2002). So even though the long-short category mean return of 8.8% is middling compared to other table categories, its coefficient of variation, a measure of variability around the mean, is lowest of all by a healthy margin. Overall, the purported lower risk of hedge fund returns seems to be emulated in the long-short category over the longer ten year period (versus three years for Table I).

V. Conclusion

In recent years a number of mutual funds have been developed that attempt to mimic the strategies employed by hedge funds. Like hedge funds, these long-short mutual funds seek to provide their investors enhanced risk-adjusted returns, typically by taking short positions against the overall market. The market for long-short mutual funds has only recently matured to a point where their costs and benefits can be quantified.

Our results indicate that long-short funds deliver higher-risk adjusted returns than similarly positioned traditional mutual funds, especially when the funds are held as a smaller percentage of an investor's diversified portfolio. While these funds generated slightly lower three-year returns, their lower beta more than compensated for the lower returns, as evidenced by a higher alpha for the period. The risk reduction benefits are also evidenced by an R^2 statistic that was less than half that of the comparison portfolios and a portfolio standard deviation that was about 40% lower. However, long-short category diversification benefits do not come cheap as turnover and the expense ratio are significantly higher. Taken together, the results indicate that, as a group, funds in the long-short category generally share the risk, risk-adjusted performance, and cost characteristics of the hedge funds that they are purported to mimic. The findings suggest that for those investors seeking portfolio diversification but lacking access to hedge funds, long-short mutual funds may offer a useful alternative.

Table I
Descriptive Statistics for Performance, Correlation, Risk and Cost for Long-Short Category Mutual Funds and Three Comparison Samples

Data as of December 31, 2007. The long-short sample includes the 25 Morningstar Long-Short Category mutual funds with data for the three-year period used to calculate the statistics, after controlling for multiple share classes. The three comparison samples were chosen randomly based on matching prospective objective, equity style box, and fund total assets for each long-short fund as described in the text. Using three samples gives an indication of the volatility inherent in the sampling procedure. The aggregate comparison sample simply sums the three comparison samples. Alpha, beta, and R^2 calculated versus the S&P500.

***** Indicates ANOVA test shows the comparison sample mean is significantly different from long-short category mean at the 1% level. The long-short sample mean was significantly different from the three comparison portfolios at the .01 level for beta, R^2, and standard deviation (all lower than the comparison portfolios), and audited expenses and turnover (higher).

Total Return

Sample Description	N	Mean %	Standard Deviation %	Maximum %	Minimum %
Long-Short Sample	25	5.75	3.65	12.83	-3.35
Comparison Sample 1	25	7.47	4.38	23.32	1.32
Comparison Sample 2	25	7.39	2.93	13.75	3.45
Comparison Sample 3	25	7.60	2.29	11.81	3.32
Aggregate Comparison	75	7.49	3.27	23.32	1.32

Alpha

Sample Description	N	Mean %	Standard Deviation %	Maximum %	Minimum %
Long-Short Sample	25	.41	3.53	8.61	-7.75
Comparison Sample 1	25	-.48	3.07	6.18	-6.76
Comparison Sample 2	25	-.43	2.55	5.12	-3.99
Comparison Sample 3	25	-.04	1.96	3.44	-4.43
Aggregate Comparison	75	-.31	2.56	6.18	-6.76

Sharpe Ratio

Sample Description	N	Mean	Standard Deviation	Maximum	Minimum
Long-Short Sample	25	.1408	.63197	1.08	-1.98
Comparison Sample 1	25	.3252	.30071	1.18	-.18
Comparison Sample 2	25	.3500	.30369	1.26	-.04
Comparison Sample 3	25	.3568	.21326	.77	-.04
Aggregate Comparison	75	.3440	.27235	1.26	-.18

Beta*

Sample Description	N	Mean	Standard Deviation	Maximum	Minimum
Long-Short Sample	25	.3448	.3635	1.23	-.27
Comparison Sample 1	25	1.0960	.2481	1.50	.40
Comparison Sample 2	25	1.0576	.2887	1.47	.21
Comparison Sample 3	25	1.0660	.2218	1.67	.66
Aggregate Comparison	75	1.0732	.2514	1.67	.21

R^2 *

Sample Description	N	Mean	Standard Deviation	Maximum	Minimum
Long-Short Sample	25	31.08	27.58	80	0
Comparison Sample 1	25	74.56	16.17	93	32
Comparison Sample 2	25	74.96	16.14	98	27
Comparison Sample 3	25	77.48	12.19	100	53
Aggregate Comparison	75	75.67	14.80	100	0

Standard Deviation *

Sample Description	N	Mean	Standard Deviation	Maximum	Minimum
Long-Short Sample	25	6.325	2.922	14.80	3.00
Comparison Sample 1	25	10.276	3.313	16.45	3.20
Comparison Sample 2	25	10.262	2.835	14.55	2.62
Comparison Sample 3	25	10.259	2.993	17.59	4.45
Aggregate Comparison	75	10.266	3.012	17.59	2.62

Turnover *

Sample Description	N	Mean	Standard Deviation	Maximum	Minimum
Long-Short Sample	25	280.22	417.18	2110	3
Comparison Sample 1	25	78.32	62.94	224	1
Comparison Sample 2	25	83.13	67.44	315	7
Comparison Sample 3	25	71.76	65.51	233	5
Aggregate Comparison	75	77.66	64.56	315	1

Audited Expense Ratio *

Sample Description	N	Mean	Standard Deviation	Maximum	Minimum
Long-Short Sample	25	1.956	.782	3.999	.95
Comparison Sample 1	25	1.209	.637	3.490	.68
Comparison Sample 2	25	1.270	.440	1.800	.14
Comparison Sample 3	25	1.174	.413	2.350	.25
Aggregate Comparison	75	1.217	.502	3.490	.14

Table II
Year-by-Year Total Return Comparison by Category*

	1998 %	1999 %	2000 %	2001 %	2002 %	2003 %	2004 %	2005 %	2006 %	2007 %	Mean %	Ann. Std. Dev. %	Coeff. of Var.
Morningstar Long-Short Category	20.1	27.1	3.5	1.6	-1.5	13.7	6.9	4.7	8.0	4.4	**8.8**	**8.9**	**1.00**
Number of long-short funds ex multi-share classes	6.0	11.0	12.0	16.0	17.0	21.0	24.0	25.0	33.0	47.0			
S&P 500 TR	28.6	21.0	-9.1	-11.9	-22.1	28.7	10.9	4.9	15.8	5.5	**7.2**	**17.3**	**2.39**
Russell 2000 TR	-2.6	21.3	-3.0	2.5	-20.5	47.3	18.3	4.6	18.4	-1.6	**8.5**	**18.6**	**2.20**
MSCI World Ex US LCL	10.1	32.1	-7.8	-17.5	-26.9	17.8	10.3	25.8	13.9	1.7	**6.0**	**18.7**	**3.14**
Morningstar Large Core TR	23.2	17.8	4.2	-14.4	-23.8	24.7	14.0	3.8	15.5	8.7	**7.4**	**15.8**	**2.14**
Morningstar Large Growth TR	51.2	42.6	-33.5	-29.1	-33.2	30.7	0.2	3.4	5.7	12.3	**5.0**	**30.5**	**6.06**
Morningstar Large Value TR	17.9	0.6	5.7	-3.4	-15.1	26.3	14.1	7.1	25.8	-0.4	**7.8**	**13.2**	**1.69**
Morningstar Mid Core TR	2.9	1.9	14.8	6.1	-12.4	38.7	19.1	10.1	14.7	2.0	**9.8**	**13.5**	**1.39**
Morningstar Mid Growth TR	9.5	52.5	-11.1	-21.6	-32.5	40.0	15.5	16.3	9.6	19.7	**9.8**	**26.1**	**2.67**
Morningstar Mid Value TR	5.9	-6.8	24.6	5.1	-10.0	35.9	24.3	11.5	18.8	-5.5	**10.4**	**15.4**	**1.48**
Morningstar Small Core TR	-7.6	16.7	23.2	14.6	-14.2	42.6	23.6	6.3	21.2	-5.4	**12.1**	**17.4**	**1.43**
Morningstar Small Growth TR	-6.6	46.8	-12.1	-12.9	-36.9	52.7	13.5	5.8	10.0	11.1	**7.1**	**27.1**	**3.80**
Morningstar Small Value TR	-3.7	-5.2	18.7	18.6	-8.2	48.9	24.0	5.1	20.0	-8.2	**11.0**	**18.4**	**1.67**

* From Morningstar Principia Pro database, as of January 31, 2008.

Coeffecient of variation = standard deviation/mean

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INSIDER TRADING: IN SEARCH OF DEFINITIONAL CLARIFICATION

John S. Bowdidge, George S. Swales, Jr. and C. Edward Chang

I. Introduction / Literature Review

A person who is only a beginner at investigating what is happening in the stock markets has already heard the term "insider trading." An ultra-simple definition of the term could easily be: "Purchasing or selling shares of a corporation's stocks by an insider of that corporation."

But very quickly we can enlarge upon - and complicate - that definition by indicating that such a purchaser or seller could have the advantage of additional (and **secret**) knowledge regarding the stock. As we shall see in the pages to follow, such **secret** knowledge may cause an insider to *violate certain rules* set by the Securities and Exchange Commission.

The pages to follow are dedicated to bringing clarification to insider trading - of both the *legal* and *illegal* types. And unfortunately we shall experience that numerous writers on the subject make little or no effort to differentiate between the *legal* and *illegal*.

II. Some Mass Media Treatment Of Insider Trading

Usually, when an American encounters the term "insider trading," it comes to them through the mass media. Here are some examples.

Warning to the reader! Each of these four reports commits improper use of the term "insider trading!"

The internationally-respected news service *Reuters* on November 18, 2003 reported on the fate of Martha Stewart friend Samuel Waksal, founder of ill-fated ImClone Systems: "Waksal is currently serving a seven-year term for insider trading in his own company" (Charges). A year and a half later, Larry Neumeister of *The New York Sun* reported:

> Two friends of jailed ImClone Systems founder and former chief executive officer Samuel Waksal were arrested yesterday on insider trading charges, prosecutors said (Neumeister)

Even within *The Concise Encyclopedia of Economics*, David Haddock has written:

> Since the depths of the Great Depression, the Securities and Exchange Commission (SEC) has tried to prevent insider trading in U.S. securities markets (Haddock).

Even our nation's leading business periodical, *The Wall Street Journal*, joins the club with a

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story by a team of its reporters for the issue of May 9, 2007:

> Yesterday, the Securities and Exchange Commission filed a lawsuit against Kan King Wong and his wife, Charlotte Ka On Wong Lueng, in U.S. District Court in Manhattan, charging them with insider trading in connection with their purchases of 415,000 Dow Jones shares (Scannell, *et al.*).

The concept has been introduced; let's examine it.

III. Mini-Analysis Of "Insider Trading"

Each of the preceding reports, authored by responsible journalists, is equivalent to the following statement by a driver on a busy Interstate highway: "A state trooper stopped me and gave me a ticket for **driving!**"

For driving? There is nothing illegal about **driving!** *However,* driving B just as in the case of *insider trading* B can indeed be done in an *illegal* manner. Even Webster's 1988 Dictionary has a hard time separating *fully legitimate* insider trading from *illegal* insider trading: "Insider trading ... the buying or selling of a company's stock by one who has access to information not made public: trading on such information may be illegal" (Webster's, p. 699). The current authors would counsel Webster's: "Work on that definition!"

Flagrant Display Of Not Understanding The Term

It is easily understood that a journalist far, far removed from Wall Street could slip up and misuse our key term. But there is indeed surprise when a writer closely watching nationally-important transactions makes that very same slip-up! Especially surprising when the writer's publication specializes in *business*! Credit such a slip-up to Paul Davies of *The Wall Street Journal*. Here's a look. Not even the headline writer's words could rescue Paul Davies: "Goldman Ex-Analyst Is Fifth to Plead Guilty in Broad Insider-Trading Scheme."

Here are short excerpts from the Davies article under that headline for August 29, 2007:

> A former Goldman Sachs Group Inc. analyst pleaded guilty to his role in an insider-trading scheme that was hatched in a Russian day spa and grew to include more than a dozen conspirators in the U.S., Germany and Croatia. The scandal caught the attention of Wall Street and prompted investigators to intensify efforts to root out insider trading, with more cases said to be under investigation.... Eugene Plotkin, a Russian-born Harvard graduate and onetime competitive ballroom dancer, pleaded guilty to conspiracy and eight counts of insider trading.... Mr. [Stanislav] Shpigelman pleaded guilty last year to insider trading and was sentenced in January to 37 months in prison (Davies)

From a strictly **legal** standpoint, there is no crime mentioned in the preceding excerpt: insider trading is a legal stockholder activity. And that passage (with its headline) has committed

six typographical errors. Very clearly, for accuracy to prevail, the term "illegal" should precede each of those six mentions.

Who Is An Insider?

Very clearly, David D. Glass is an "insider" at Wal-Mart. He was Chief Finance Officer there from 1976 to 1984, Chief Operating Officer 1984 to 1988, CEO from 1988 to 2000, and as of last report was still a member of the Board. Glass owns $67.2 million in Wal-Mart stock (*Wal-Mart Watch*), and there are reports from time to time of his buying or selling Wal-Mart stock. Yes indeed, Glass would definitely be defined as an "insider."

His "insider trading" especially made the news in March of 2000 when Kevin Connoley wrote the following for *Missourinet*:

> Where do you get 96 million dollars to buy a baseball team? The Kansas City Star reports that David Glass will sell nearly 40 percent of his Wal-Mart stock to raise the money. Glass has filed with the Securities and Exchange Commission to sell 2-million shares, valued at about 111-million dollars. The transaction will leave Glass with about 3 million shares of Wal-Mart stock (Connoley).

So far as the current authors can determine, Glass has never served any prison time whatsoever, not for *illegal* insider trading or for any other charge! Remember from a previous page, ImClone Systems founder Samuel Waksal is *in prison* for seven years!

As a person searches for a definition of a corporation's "insider," a definition that frequently comes up is: member of management, member of the board of directors, or owner of at least 10 percent of the stock of the company. However, the current study acquired a much more simple definition from the *official website* of the *Securities and Exchange Commission*, or SEC:

> The legal version is when corporate insiders - officers, directors, and employees - buy and sell stock in their own companies. When corporate insiders trade in their own securities, they must report their trades to the SEC ("Insider Trading," available on the Internet at *www.sec.gov/answers/insider.htm*).

Note that sentence: "When corporate insiders trade in their own securities, they must report their trades to the SEC" (*Ibid.*). We look now at a high-level "corporate insider" who followed completely that instruction from the SEC.

Lee Scott Buys Shares of His Firm's Common Stock

For its issue of January 9, 2007, *The Morning News* of Northwest Arkansas furnished this report for its readers:

> Lee Scott, president and CEO of Wal-Mart Stores Inc., picked up almost $1.5 million this week when he sold more than 30,000 shares of Wal-Mart shares [somewhat unique wording from *The Morning News*]. In two separate transactions filed Friday with the

> U.S. Securities [and] Exchange Commission, Scott sold 31,544 shares of [Wal-Mart] common stock at $47.39 and another 594 shares at the same price to pay taxes on the 31,544 shares sold (Scott Sells).

The current authors add mathematical accuracy by stating that selling 31,544 shares at $47.39 per share would result in proceeds of the sale reaching $1,494,870.10 - wisely rounded off by *The Morning News* at $1.5 million. The attention to tax considerations involved Scott selling an additional 594 shares at the same price of $47.39 per share, netting Scott $28,149.66 to pay the appropriate taxes. And it is proudly noted in *The Morning News* version that Scott filed the two "separate transactions" with the Securities and Exchange Commission.

The narrative which you have just read describes a major case of *insider trading!* And the authors proudly note that the action was **perfectly legal!**

In certain situations, however, the temptation for an insider to engage in an ***illegal*** form of insider trading can be *overwhelming!* Let's create such a fictional situation.

An Attempt At An Example Of Doing It Illegally

Here is a *fictional* example. *Fictional* because to describe a **true** case and make *errors* in the *presentation* of it could possibly result in deep legal difficulties for such an author.

> Bulldog Chemicals, Incorporated is confident that it has at last produced a simple medication that can thankfully eradicate the HIV virus among millions of children in Sub-Saharan Africa. What a blessing, a blessing reported in news reports around the globe. However, the World Health Organization (WHO) notifies Bulldog Chemicals - very secretly for the moment - that the new medication has no impact whatsoever! Such word becoming public *right now* could cause a catastrophic drop in share price on Bulldog Chemicals' millions of shares of common stock traded via the New York Stock Exchange (NYSE). As might be easily guessed, Bulldog Chemicals has previously publicized the "blessed healing power" of its new drug. Price per share of Bulldog Chemicals common stock has shot up considerably! Immediately, the small circle of Bulldog Chemicals officers and the few holders of large amounts of Bulldog Chemicals stock - call them all "***insiders***" **-** sell their shares as quickly as they can at the NYSE.

Members of the general investing public make no such move. They know of no good reason to sell Bulldog Chemicals stock!

Those insiders, however, escape *financially* from a tragic loss in the value of their stock holdings. But they will soon face charges of engaging in a kind of insider trading that is clearly **illegal!**

Documenting Further Public Confusion

Just as the American press gives ample evidence of not understanding "insider trading," Great Britain's *The Economist* falls into the same trap. In its issue of May 15, 2007, there is a

reference to "Ivan Boesky, an arbitrageur who went to jail for insider trading" (Greed is still good).

The Economist of May 26, 2006 treats America's Enron scandal and tragedy, by referring to Kenneth Lay and Jeffrey Skilling in this manner:

> Mr Lay was found guilty by the jury of six counts of conspiracy and fraud and Mr Skilling on 18 counts but was acquitted on all but one charge of insider trading (The fraudsters).

Even Great Britain's respected *The Economist* worded the sentence improperly.

A scandal in Croatia was treated by *The Economist* on June 19, 2007:

> The Croatian authorities on June 16th announced the arrest of six officials from the Croation Privatisation Fund (HPF).... The officials are suspected of accepting bribes; selling state firms without competitive tenders, usually at a large discount; real estate fraud; and insider trading.

Here at home, the Martha Stewart case really became legally complicated. Harry Browne, writing humorously for *LewRockwell.com*, enjoyed joking about her case, which involved selling - just in time - ImClone Systems stock. Allegedly she had some inside information but was not an ImClone insider. Here's how Browne treated it:

> In the first place, the law does *not* say that insider trading is a crime. And she wasn't indicted for insider trading.... Thus she was convicted on three counts of lying about something that isn't a crime and that she wasn't charged with doing. If the government can't charge her with insider trading, what difference does it make whether she *lied* about insider trading? (Browne).

IV. Expansion Of The Term "Insider"

Earlier in this research effort, there was quoted the following quick definition of "insiders" from the Securities and Exchange Commission:

> The legal version is when corporate insiders - officers, directors, and employees - buy and sell stock in their own companies. When corporate insiders trade in their own securities, they must report their trades to the SEC ("Insider Trading," available on the Internet at *www.sec.gov/answers/insider.htm*).

Such insiders - officers, directors, and employees - are indeed **not** to use very special inside information of the firm as a means to profit before the general public knows some indeed bad news of the firm. As of summer 2007, F. John Reh of *About.com*, a part of *The New York Times* company, spread the word that the SEC has a broader definition of an insider. Here's how Reh explained it:

> The SEC includes in its definition of insiders those who have "temporary" or "constructive" access to the material information. If the President of a company tells you that the company's best hope for a breakthrough product isn't going to get regulatory approval, you are now every bit as much an insider as he is, with respect to that information. It is illegal for him to trade based on that knowledge before it becomes public knowledge. It is equally illegal for you to do so because you are now a "temporary insider." This remains true regardless of how many times the information is passed. If the president tells his barber, who tells her [?] baby sitter, who tells her doctor, who tells you, [then] the barber, baby sitter, doctor and you are all "temporary insiders" (Reh).

Let's expand upon that idea which F. John Reh picked up from the SEC. Sometimes by carefully watching a firm and its personnel in action, one can produce a look at the inside mood B and perhaps acquire some *inside* information. The next section contains an example of this.

Things May Be Developing Inside

For *The Wall Street Journal* edition of August 8, 2007, Nicolas Brulliard attempted to peek into the windows of the Xerox Corporation. His opening paragraph went this way:

> Three of Xerox Corporation's top executives recently made a move seldom duplicated at the maker of printers and copiers: They bought some of their company's stock (Brulliard).

Author Brulliard quoted several people who saw nothing unusual in that move by some top executives. He then gave space to another view:

> However, Jack Adamo editor of Insiders Plus, a weekly investment newsletter that follows insider activity, said he is suspicious when several executives buy their company's stock at the same time. The unanimity among Xerox's top executives suggests that they acted in concert and that their actions may have been more of a public relations move in the wake of the drop of the stock price (*Ibid.*).

It was clear that the company did not want to provide any discussion of the *Journal* story: "A Xerox spokesman declined to comment and said all three executives were unavailable for comment" (*Ibid.*). At least for the moment, the company's attitude seemed to be: "This is *inside* information, and it will remain *inside*."

The Classic Case of R. Foster Winans

Very clearly, we've seen that the illegal side of insider trading involves someone making use of information not available to the general public. From 1982 to 1984, a journalist by the name of R. Foster Winans wrote a column titled "Heard on the Street" for *The Wall Street Journal*. According to *Wikipedia, the free encyclopedia*, here's how Winans entered the insider arena:

> During a well-publicized crackdown on insider trading that would later snare some of the hottest traders on Wall Street (such as Michael Milken and Ivan Boesky), [Winans] was indicted by then-U.S. Attorney Rudolph Giuliani and convicted in 1985 of violating Federal law by leaking advance word of the contents of his columns to a stockbroker, Peter N. Brant, at Kidder, Peabody & Co., an old-line brokerage firm (R. Foster Winans).

Said another way, Winans would have extremely important information on major American firms and - prior to the appearing of his column in *The Wall Street Journal* - he would have a broker make moves to greatly help some of Winans' friends. Certain of these moves were **very helpful** to Winans' buddies - to a total tune of an estimated $1,000,000**! His** cut was only $31,000. He served about eight months in prison and paid a $5,000 fine (Where are they now?)

As for the Winans cut of $31,000, *Time* writer William A. Henry III explained it in the following manner. Note that Henry mentions two other brokers employed at the time by Kidder Peabody:

> But in May [1984] the SEC charged in a civil suit that two stockbrokers who shared in the scheme, David Brant and Kenneth Felis, both then employed by Kidder Peabody, paid Winans $31,000 disguised as interior-decoration fees to his New York City roommate, David Carpenter (Henry).

The U.S. Supreme Court spoke in a manner completely harmonious with the mood of this current study: there is still misunderstanding regarding insider trading! And that misunderstanding has indeed seeped into the Supreme Court. As Winans wrote in a *New York Times* op-ed, when the U.S. Supreme Court ruled on his case in 1987, the Justices **agreed** that he had defrauded the *Journal* but **split** on whether it constituted insider trading - legal or **illegal!** (Where are they now? - **bold** emphasis by the current authors).

V. Conclusion

Like so many human activities, *insider trading* can be carried out in a legal manner as well as in an illegal way. The current study has attempted to show both ways of *insider trading*. Further, the study has clearly established that there are indeed respectable journalists who regularly - by error - give the term a strictly criminal meaning. May we all learn to engage in this activity in a perfectly legal manner. May we also encourage appropriate officials to punish and eliminate those who use the technique in an illegal manner.

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On the Pricing of Credit Risk in Eurocurrency Market

Chu-Sheng Tai

Abstract

Most of previous studies on credit risk have been focused on corporate bond markets. This paper focuses on whether the credit risk is priced in the Eurocurrency market. The empirical test relies on a multivariate GARCH (1,1)-in-mean version of the ICAPM model to describe the joint stochastic process of three state variables: world market risk, interest rate risk, and credit risk, during the period January 1986 to December 2002. The paper documents a negative, significant, and time-varying systematic credit risk premium.

I. Introduction

The corporate bond and risk management literature have over the last years clearly emphasized the benefits and limits of credit risk diversification for corporate bond portfolios (see Crouhy, Galai and Mark (2001) or Jarrow and Turnbull (2000) for a survey). However, our understanding of the credit risk structure is limited and empirical work that aims at characterizing credit risk structure of interest rate in well-established capital markets such as the Eurocurrency market is still lacking. This study attempts to fill the gap by empirically characterizing the time-variation of the credit risk premium in the Eurocurrency market. Eurocurrency deposits as corporate liabilities have finite lives and pre-specified terminal value. Therefore, Eurocurrency deposits involve two types of risk: interest rate risk and credit risk. These two types of risk and their interactions are fundamental determinants of the valuation of Eurocurrency deposits and their derivatives. This study attempts to establish whether credit risk is priced in the Eurocurrency deposit rates. In particular, a conditional version of Merton's (1973) intertemporal CAPM is used to pursue this objective. For that purpose, I introduce the TED spread, which is the yield spread of three-month futures contracts for U.S. Treasuries and three-month contracts for Eurodollars having identical expiration months, as a state variable in addition to an interest rate risk state variable in a multivariate GARCH (1,1)- in-mean (MGARCH-M) return generating model in order to examine whether systematic credit risk is indeed priced in the Eurocurrency deposit rates. The empirical results show that the credit risk premium is negative, significant and time -varying.

The paper is organized as follows. The next section motivates the use of stochastic discount factor (SDF) model. The econometric model - MGARCH-M is described in Section III. Section IV discussed the data used. The empirical results are reported in Section V. Some concluding remarks are reserved for Section VI.

II. The Theoretical Motivation: Stochastic Discount Factor (SDF)

We know that the first-order condition of any consumer-investor's portfolio optimization problem can be written as:

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$$E[M_t R_{j,t} \mid \Omega_{t-1}] = 1, \ \forall j = 1 \cdots\cdots N \tag{1}$$

where M_t is the known as a stochastic discount factor, an intertemporal marginal rate of substitution, or pricing kernel; $R_{j,t}$ is the gross return of asset j at time t and Ω_{t-1} is market information known at time $t-1$. Essentially equation (1) is the first-order condition of any consumer-investor's portfolio optimization problem, and it says that the expected present value of future payoffs, $R_{j,t}$, discounted at M_t from investing \$1 in asset j today should be equal to \$1. In other words, M_t satisfying equation (1) is a valid stochastic discount factor which ensures that there is no arbitrage opportunity when market is complete and in equilibrium. Without specifying the form of M_t, equation (1) has little empirical content since it is easy to find some random variable M_t for which the equation holds. Thus, it is the specific form of M_t implied by an asset-pricing model that gives equation (1) further empirical content (e.g., Ferson (1995)). Suppose M_t and $R_{j,t}$ have the following factor representations:

$$M_t = \alpha_0 + \sum_{k=1}^{K} \beta_k F_{k,t} + u_t \tag{2}$$

$$r_{j,t} = \alpha_j + \sum_{k=1}^{K} \beta_{jk} F_{k,t} + \varepsilon_{j,t} \quad \forall j = 1 \cdots\cdots N \tag{3}$$

where $r_{j,t} = R_{j,t} - R_{0,t}$ is the raw returns of asset j in excess of the risk-free rate, $R_{0,t}$, at time t, $E[u_t F_{k,t} \mid \Omega_{t-1}] = E[u_t \mid \Omega_{t-1}] = E[\varepsilon_{j,t} F_{k,t} \mid \Omega_{t-1}] = E[\varepsilon_{j,t} \mid \Omega_{t-1}] = 0 \ \forall j,k$; $F_{k,t}s$ are common risk factors which capture systematic risk affecting all assets $r_{j,t}$ including M_t; β_{jk} are the associated time-invariant factor loadings which measure the sensitivities of the asset to the common risk factors, while u_t is an innovation and $\varepsilon_{j,t}$ are idiosyncratic terms which reflect unsystematic risk. The risk-free rate, $R_{0,t-1}$, must also satisfy equation (1).

$$E[M_t R_{0,t-1} \mid \Omega_{t-1}] = 1 \tag{4}$$

Subtract Eq.(4) from Eq.(1), we obtain

$$E[M_t r_{j,t} \mid \Omega_{t-1}] = 0 \quad \forall j = 1 \cdots\cdots N \tag{5}$$

Apply the definition of covariance to equation (5), obtaining:

$$E[r_{j,t} \mid \Omega_{t-1}] = \frac{Cov(r_{j,t}; -M_t \mid \Omega_{t-1})}{E[M_t \mid \Omega_{t-1}]} \quad \forall j = 1 \cdots\cdots N \tag{6}$$

Substitute equation (2) into equation (6):

$$E[r_{j,t} \mid \Omega_{t-1}] = \sum_{k=1}^{K} \frac{-\beta_{jk}}{E[M_t \mid \Omega_{t-1}]} Cov(r_{j,t}, F_{k,t} \mid \Omega_{t-1}) = \sum_{k=1}^{K} \lambda_{k,t-1} Cov(r_{j,t}; F_{k,t} \mid \Omega_{t-1}) \tag{7}$$

where $\lambda_{k,t-1}$ is the time-varying price of factor risk. Equation (7) is a general conditional multi-factor asset-pricing model derived from the intertemporal consumption-investment optimization problem. In empirical test, the SDF is projected onto three risk factors: the world market risk, interest rate risk, and credit risk. I can now rewrite the conditional multi-factor asset-pricing model in equation (7) as

$$r_{j,t} = \lambda_{MKT,t-1} Cov(r_{j,t}, r_{MKT,t} \mid \Omega_{t-1}) + \lambda_{INT,t-1} Cov(r_{j,t}; r_{INT,t} \mid \Omega_{t-1}) + \lambda_{TED,t-1} Cov(r_{j,t}; r_{TED,t} \mid \Omega_{t-1}) + \varepsilon_{j,t} \tag{8}$$

where "*MKT*" , "*INT*", and "*TED*" denote world market, interest rate, and credit risks, respectively. In modeling the stochastic evolution of interest rate and credit risk factors, I assume that they are mean-reverting as suggested by Longstaff and Schwartz (1995) and Duffee (1999). Based on these empirical facts, I define the interest rate factor (*INT*), and credit risk factor (*TED*) as follows:

$$INT_t = \beta_0 + \beta_1 INT_{t-1} + \varepsilon_{INT,t} \quad (9)$$

$$TED_t = \gamma_0 + \gamma_1 TED_{t-1} + \varepsilon_{TED,t} \quad (10)$$

III. Econometric Methodology

The conditional ICAPM in equation (8) has to hold for every asset, including the market portfolio. However, the model does not impose any restrictions on the dynamics of the conditional second moments. Given the computational difficulties in estimating a larger system of asset returns, parsimony becomes an important factor in choosing different parameterizations. In this paper, a parsimonious GARCH process originally proposed by Ding and Engle (1994) is modified to accommodate the GARCH-in-mean effect. Specifically, the dynamic process for the conditional variance-covariance matrix of asset returns is specified as:

$$H_t = H_0 * (\iota\iota' - aa' - bb') + aa' * \varepsilon_{t-1}\varepsilon_{t-1}' + bb' * H_{t-1} \quad (11)$$

where H_t is $(N+3)\times(N+3)$ time-varying variance-covariance matrix of asset returns and risk factors. $N+3$ is the number of equations where the first N equations are those for the Eurocurrency deposits, the $(N+1)^{th}$ equation is for the interest rate risk factor; the $(N+2)^{th}$ equation is for the credit risk factor, and the $(N+3)^{th}$ equation is for the world market risk factor. H_0 is the unconditional variance-covariance matrix of innovations, ε_t. ι is a $(N+3)\times 1$ vector of ones, a and b are $(N+3)\times 1$ vectors of unknown parameters, and * denotes element by element matrix product. The H_0 is unobservable and has to be estimated. As suggested by De Santis and Gerard (1997, 1998), it can be consistently estimated using iterative procedure. In particular, H_0 is set equal to the sample covariance matrix of the excess return in the first iteration, and then it is updated using the covariance matrix of the estimated residual at the end of each iteration. Under the assumption of conditional normality, the log-likelihood to be maximized can be written as:

$$\ln L(\theta) = -\frac{TN}{2}\ln 2\pi - \frac{1}{2}\sum_{t=1}^{T}\ln | H_t(\theta) | - \frac{1}{2}\sum \varepsilon_t(\theta)' \, H_t(\theta)^{-1}\varepsilon_t(\theta) \quad (12)$$

where θ is the vector of unknown parameters in the model and T is the number of observations over time. Since the normality assumption is often violated in financial time series, a quasi-maximum likelihood estimation (QML) proposed by Bollerselv and Wooldridge (1992) which allows inference in the presence of departures from conditional normality is used. Under standard regularity conditions, the QML estimator is consistent and asymptotically normal and statistical inferences can be carried out by computing robust Wald statistics. The QML estimates

can be obtained by maximizing equation (12), and calculating a robust estimate of the covariance of the parameter estimates using the matrix of second derivatives and the average of the period-by-period outer products of the gradient. Optimization is performed using the Broyden, Fletcher, Goldfarb and Shanno (BFGS) algorithm, and the robust variance-covariance matrix of the estimated parameters is computed from the last BFGS iteration.

IV. Data and Summary Statistics

The sample consists of weekly data on four Eurocurrency deposit rates and spot exchange rates: deutsche mark (DM), Japanese (JP), U.K. pound (UK), and Swiss franc (SW). Three risk factors are a world market risk measured as the log first difference of Datastream world total return index (dividend included) in excess of the 7-day Eurodollar deposit rate (MKT), an interest rate risk measured as the yield difference between 10-year Treasury constant maturity rate and 7-day Eurodollar rate (INT), and a credit risk proxied by the TED spread (TED). The 7-day Eurodollar deposit rate is used as risk-free rate to compute the excess world equity returns, and the four Eurocurrency deposits. Excess world equity return is calculated as $\ln(\frac{p_{t+1}}{p_t}) - \frac{1}{52}\ln(1+i_t^{us\$})$ where p_t is the Datastream world total return index at time t; $i_t^{US\$}$ is annualized 7-day Eurodollar rate. Excess Eurocurrency return is calculated as $\frac{1}{52}\ln(1+i_t^*) + \ln(\frac{s_{t+1}}{s_t}) - \frac{1}{52}\ln(1+i_t^{US\$})$ where s_t is the spot exchange rate at time t expressed as U.S. dollar price of one unit of foreign currency; i_t^* is the annualized 7-day Eurocurrency deposit rate known at time t. The instruments used to model the dynamic of three risk prices include a dividend yield on Datastream world total return index in excess of the 7-day Eurodollar deposit rate (DIV), a change in the implied volatility index (VIX) from Chicago Board Option's Exchange, which provides an objective, observable, and dynamic measure of stock uncertainty, and a constant ($CONSTANT$). All the data are extracted from Datastream and cover the period from January 1, 1986 through December 22, 2002, which is a 887-data-point series. However, this paper works with rates of return and use the first difference of information variables, and finally all the instruments are used with a one-week lag, relative to the excess return series; that leaves 885 observations expanding from January 17, 1986 to December 27, 2002. All the data are extracted from Datastream.

Table 1 presents summary statistics of the continuously compounded excess world equity returns and Eurocurrency returns. As can be seen from Panel A, among the four Eurocurrency returns, UK has the highest mean return (0.056%) and JP has the lowest mean return (0.007%). As for the risk factors, TED has the highest mean return (0.567%), and MKT registers the lowest mean return (0.068%). Table 1 also reports Bera-Jarque and Ljung-Box statistics. In all cases, the Bera-Jarque test statistic strongly rejects the hypothesis of normally distributed returns. The Ljung-Box test statistics, which is defined as: $LB(k) = T(T+2)\sum_{j=1}^{k}\frac{\rho_j^2}{T-j}$ where ρ_j is the j^{th} lag autocorrelation, k is the number of autocorrelations, and T is the sample size (See Ljung and Box (1978)), for raw returns, $LB(24)$, is not significant for any of the Eurocurrency returns, implying that the

Eurocurrency market is weak-form efficient. For squared returns, $LB^2(24)$ is significant at least at the 5% level for in all cases, indicating strong nonlinear dependencies in those returns. This is consistent with the volatility clustering observed in most financial asset returns: Large (small) changes in prices tend to be followed by large (small) changes of either sign. The GARCH models used in this study are well known to capture this property. The unconditional correlation coefficients reported in the bottom half of Table 1 show that all Eurocurrency returns are positively correlated with all three factor returns except SW which is negatively correlated with TED.

V. Empirical Evidence

Many empirical studies have shown that the prices of risk are time varying. (e.g., Harvey (1991), Dumas and Solnik (1995), De Santis and Gerard (1997, 1998), Tai (1999, 2001), and among others.) This time-varying price of risk is economically appealing in the sense that investors use all available information to form their expectations about future economic performance, and when the information changes over time, they will adjust their expectations and thus their expected risk premia when holding different risky assets. The dynamics of prices of risk are chosen according to the theoretical international asset pricing model developed by Adler and Dumas (1983). In their model, the price of world market risk is a weighted average of the coefficients of risk aversion of all national investors. Since the weights measure the relative wealth of each country and if all investors are risk averse, the world price of market risk should be positive. Thus, similar to Bekaert and Harvey (1995) and De Santis and Gerard (1997,1998) an exponential function is used to model the dynamic of $\lambda_{MKT,t-1}$ and for the dynamics of $\lambda_{INT,t-1}$ and $\lambda_{TED,t-1}$, a linear specification is adopted because the model does not restrict the prices of interest rate and credit risks to be positive.

$$\lambda_{MKT,t-1} = \exp(\varphi'_{MKT} z_{t-1}) \tag{13}$$

$$\lambda_{INT,t-1} = \varphi'_{INT} z_{t-1} \tag{14}$$

$$\lambda_{TED,t-1} = \varphi'_{TED} z_{t-1} \tag{15}$$

where $z_{m,t-1} = \{CONSTANT, DIV, VIX\}$

is vector of information variables observed at the end of time $t-1$ and φ's are time-invariant vectors of weights. Table 2 contains the estimation results for equation (8). The parameter estimates for both the conditional mean and variance processes are reported in Panel A. Summary statistics concerning the risk premia and diagnostic test statistics for the standardized residuals are shown in Panel B. Finally, the hypothesis tests regarding the prices of risk and the predictability of information variables are presented in Panel C. The results are very encouraging. For example, the joint null hypothesis of zero prices of market, interest rate, and credit risks is strong rejected by the Wald test statistic with a p-value of zero. The joint null hypothesis of constant prices of three risks is also significantly rejected with a p-value of zero. Next, the null hypothesis of constant price of factor risk is tested individually, and the Wald test statistic rejects the null at 1% level for INT and TED, suggesting that not only are interest rate and credit risks priced in the Eurocurrency market, but also they are time-varying. The two information variables selected to predict the dynamics of the risk prices are all significant, which are confirmed by the Wald test statistics. The strong predictability of VIX found here shed a

new light on the usefulness of implied volatility index in predicting the dynamics of risk prices since *VIX* has not been used in testing conditional asset-pricing model.

Next, consider the parameter estimates for the conditional variance process. As can be seen in the table, the elements in the vectors a and b are statistically significant at 1% for all return series, suggesting strong GARCH effect in both Eurocurrency and world equity markets.

Panel B reports some diagnostic tests performed on the standardized residuals and the standardized residuals squared for the purpose of assessing the adequacy of the model. Most of the Bera-Jarque test statistics for the standardized residuals are lower than the corresponding statistics for the original return series. However, the hypothesis of normality is still rejected for all cases but *DM* . Such evidence against normality validates the use of robust standard errors computed from using the quasi-maximum likelihood method of Bollerslev and Wooldridge (1992). I also compute the Ljung-Box portmanteau statistics to test the null hypothesis of zero autocorrelation up to 24 lags in both the standardized residuals and the standardized residuals squared. The results in Panel B indicate that the MGARCH(1,1)-M specification used in this study performs quite well in capturing the dynamics of the conditional first and second moments with few exceptions.

One advantage of modeling the conditional second moments via MGARCH approach is that it enables one to recover some interesting statistics such as conditional volatility, and, more importantly, the size of different risk premia. These interesting statistics will not be available if one leaves the condition second moments unspecified such as the pricing kernel approach employed by Dumas (1993), Dumas and Solnik (1995), and Tai (1999).[2] Panel B of Table 2 reports those statistics. For example, the predicted weekly average risk premium for Eurocurrency return is –0.0004% for *DM* , 0.0221% for *JP* , -0.0058% for *UK* , and -0.01% for *SW* . All these risk premia are basically dominated by the market risk premia; however, the credit risk premium is still an important component risk premium in Eurocurrency market because the annualized credit risk premia range from negative 52 basis points for *DM* to negative 64 basis points for *SW* . These statistics suggest the importance of modeling the time-varying credit risk premium in the Eurocurrency market.

VI. Summary and Concluding Remarks

Most of previous studies on credit risk have been focused on corporate bond markets. This paper focuses on whether the credit risk is priced in the Eurocurrency market. The empirical test relies on a multivariate GARCH (1,1) - in- mean version of the ICAPM model to describe the joint stochastic process of three state variables: world market risk, interest rate risk, and credit risk, during the period January 1986 to December 2002. The paper documents a negative, significant, and time-varying systematic credit risk premium.

[2] See the comments provided by Campbell Harvey in Dumas (1993).

Table 1
Summary statistics of Eurocurrency and risk factor returns [a]

	DM	*JP*	*UK*	*SW*	*INT*	*TED*	*MKT*
Mean (%)	0.023	0.007	0.056	0.015	1.188	0.567	0.068
Std. Dev. (%)	1.520	1.673	1.372	1.682	1.245	0.321	1.979
Minimum (%)	-5.244	-6.174	-10.095	-6.775	-3.652	0.088	-13.755
Maximum (%)	5.144	14.500	5.005	6.023	3.721	1.624	7.608
$B-J$	13.145**	1852.35**	518.58**	23.851**	12.783**	101.166**	768.406
$LB(24)$	19.922	29.481	26.101	17.987	15107.40**	13612.64**	31.679**
$LB^2(24)$	90.914**	65.445**	41.605*	42.253*	15230.11**	12987.74**	45.836**
	DM	*JP*	*UK*	*SW*	*INT*	*TED*	*MKT*
DM	1						
JP	0.505	1					
UK	0.701	0.363	1				
SW	0.928	0.521	0.666	1			
INT	0.025	0.064	0.000	0.018	1		
TED	0.006	0.032	0.013	-0.007	-0.426	1	
MKT	0.135	0.238	0.150	0.062	-0.014	0.010	1

[a] (i) The statistics are based on weekly data from 01/17/1986 to 12/27/2002 (885 observations). The excess Eurocurrency returns are deutsche mark (DM), Japanese (JP), U.K. pound (UK), and Swiss franc (SW). Three risk factors are a world market risk measured as the log first difference of Datastream world total return index (dividend included) in excess of the 7-day Eurodollar deposit rate (MKT), an interest rate risk measured as the yield difference between 10-year Treasury constant maturity rate and 7-day Eurodollar rate (INT), and a credit risk proxied by the TED spread (TED). The 7-day Eurodollar deposit rate is used as risk-free rate to compute the excess world equity returns, and the four Eurocurrency deposits. (ii) The Bera-Jarque ($B-J$) tests normality based on both skewness and excess kurtosis and is distributed χ^2 with two degrees of freedom. (iii) $LB(24)$ and $LB^2(24)$ denote the Ljung-Box test statistics for up to the 24th order autocorrelation of the raw and squared returns, respectively. (iv) * and ** denote statistical significance at the 5% and 1% level, respectively.

Table 2: ICAPM with time-varying risk prices [a]

Panel A: Parameter estimates

Conditional mean process
world prices of market, interest rate, and credit risks

	CONSTANT	*DIV*	*VIX*
φ_{MKT}	1.683	0.382	-0.672
	(0.667)*	(0.550)	(2.715)
φ_{INT}	888.159	813.791	326.920
	(242.401)**	(162.298)**	(606.315)
φ_{TED}	-132.570	-112.896	-291.583
	(25.353)**	(26.887)**	(103.458)**

Conditional variance process

	DM	*JP*	*UK*	*SW*	*INT*	*TED*	*MKT*
a	0.187	0.225	0.183	0.191	0.362	0.352	0.180
	(0.016)**	(0.030)**	(0.024)**	(0.017)**	(0.001)**	(0.011)**	(0.030)**
b	0.965	0.963	0.959	0.962	0.929	0.934	0.978
	(0.007)**	(0.011)**	(0.013)**	(0.007)**	(0.000)**	(0.004)**	(0.008)**

Panel B: Summary statistics and residual diagnostics

Summary statistics

	DM	*JP*	*UK*	*SW*	*INT*	*TED*	*MKT*
Predicted total risk premium (%)	0.0004	0.0221	0.0058	-0.0100	1.1727	0.5660	0.1173
Market risk premium (%)	0.0174	0.0322	0.0169	0.0091			0.1600
Interest risk premium (%)	-0.0070	-0.0212	0.0006	-0.0067			0.0034
Credit risk premium (%)	-0.0100	0.0111	-0.0117	-0.0124			-0.0472
Prices of factor risk					289.733	-49.707	411.628
Conditional volatility (%)	1.5087	1.6315	1.3618	1.6725	0.4187	0.0920	1.9298

Residual diagnostics

$B-J$	4.929	513.09**	3613.77**	556.35**	297310**	733.66**	918.65**
$LB(24)$	16.171	26.910	16.246	18.926	46.048**	32.090	31.885
$LB^2(24)$	37.134*	12.304	12.582	9.868	3.251	100.32**	13.747

Table 2 (continued)

Panel C: Hypothesis tests concerning prices of risks and the predictability of instruments

Null Hypothesis	Wald	d.f.	P-Value
1. Are the prices of interest rate, credit and market risks equal to zero? $H0: \varphi_{INT}^{Z} = \varphi_{TED}^{Z} = \varphi_{MKT}^{Z} = 0; Z = \{CONSTANT, DIV, VIX\}$	1597.33	9	0.000
2. Are the prices of interest rate, credit and market risks constant? $H0: \varphi_{INT}^{Z} = \varphi_{TED}^{Z} = \varphi_{MKT}^{Z} = 0; Z = \{DIV, VIX\}$	60.476	6	0.000
3. Are the prices of interest rate risk equal to zero? $H0: \varphi_{INT}^{Z} = 0; Z = \{CONSTANT, DIV, VIX\}$	28.936	3	0.000
4. Are the prices of interest rate risk constant? $H0: \varphi_{INT}^{Z} = 0; Z = \{DIV, VIX\}$	25.145	2	0.000
5. Is the price of credit risk equal to zero? $H0: \varphi_{TED}^{Z} = 0; Z = \{CONSTANT, DIV, VIX\}$	46.907	3	0.000
6. Is the price of credit risk constant? $H0: \varphi_{TED}^{Z} = 0; Z = \{DIV, VIX\}$	30.776	2	0.000
7. Is the price of market risk equal to zero? $H0: \varphi_{MKT}^{Z} = 0; Z = \{CONSTANT, DIV, VIX\}$	9.496	3	0.023
8. Is the price of market risk constant? $H0: \varphi_{MKT}^{Z} = 0; Z = \{DIV, VIX\}$	0.488	2	0.783
9. Is there any predictability from the excess dividend yield? $H0: \varphi_{INT}^{Z} = \varphi_{TED}^{Z} = \varphi_{MKT}^{Z} = 0; Z = \{DIV\}$	31.958	3	0.000
10. Is there any predictability from implied volatility? $H0: \varphi_{INT}^{Z} = \varphi_{TED}^{Z} = \varphi_{MKT}^{Z} = 0; Z = \{VIX\}$	8.228	3	0.041

[a] Returns: $r_{j,t} = \lambda_{INT,t-1} h_{jINT,t} + \lambda_{TED,t-1} h_{jTED,t} + \lambda_{MKT,t-1} h_{jMKT,t} + \varepsilon_{j,t}$

$j = DM, JP, UK, SW, MKT$

$INT_t = \beta_0 + \beta_1 INT_{t-1} + \varepsilon_{INT,t}$

$TED_t = \gamma_0 + \gamma_1 TED_{t-1} + \varepsilon_{TED,t}$

$\boldsymbol{\varepsilon}_t \mid \Omega_{t-1} \sim N(0, H_t)$

where $\lambda_{TED,t-1} = \varphi_{TED}^{'} z_{t-1}$; $\lambda_{INT,t-1} = \varphi_{INT}^{'} z_{t-1}$; $\lambda_{MKT,t-1} = \exp(\varphi_{MKT}^{'} z_{t-1})$;

$Z_{t-1} = \{CONSTANT, DIV, VIX\}$

GARCH: $H_t = H_0 * (\iota\iota' - aa' - bb') + aa' * \varepsilon_{t-1}\varepsilon_{t-1}' + bb' * H_{t-1}$

Standard errors are given in parentheses. $LB(24)$ and $LB^2(24)$ are the Ljung-Box test statistics of order 24 for serial correlation in the standardized residuals and standardized residuals squared. * and ** denote statistical significance at the 5% and 1% level, respectively.

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Investor and Management Commitment in Socially Responsible Mutual Funds

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Abstract

We explore the behavior of investors and managers of socially responsible mutual funds in order to gain insight into their commitment to ethical investing. Management fees, fund turnover, loads, and fund flows are contrasted between matched samples of ethical and traditional mutual funds. Our findings indicate that both managers and investors exhibit commitment in that they appear willing to sacrifice fee revenue and financial returns, respectively, for their ethical goals.

I. Introduction

A considerable body of research has been devoted to the examination of issues relating to ethical or socially responsible mutual funds. Perhaps the two most significant questions that have been asked are i) what are the returns to socially responsible funds and ii) does socially responsible investing influence the actions of corporate management in a socially desirable way? While these are important questions, this paper addresses two other distinct, yet related questions. First, how ethical is the behavior of socially responsible fund managers toward their investors? More specifically, are these managers purely profit-motivated or do they share a commitment to ethical, socially responsible behavior in their roles as the investors' agents. Second, how committed to ethical ideals are socially responsible investors relative to their desires for financial returns?

II. Socially Responsible Fund Management and Investor Behavior

As we've suggested, the ability of socially responsible investing to persuade corporate management to act in a socially desirable manner is clearly a question of interest. This is difficult to answer, in part because of difficulties in defining what constitutes a socially desirable outcome. Cullis, Jones and Lewis (2006) provide a thorough review of the related literature and conclude that socially responsible investing seems to be capable of influencing firm behavior, at least to some extent. The question remains as to how significantly corporate behavior is influenced. This is an important question because, as Cullis, Jones and Lewis' review suggests, socially responsible investors may realize lower risk-adjusted returns, relative to other less constrained investors. Socially responsible investors may be willing to incur such a financial penalty if they knew their behavior was going to influence firms to act in a socially responsible manner. They likely would not be willing to incur this penalty if the influence on firms was insignificant.

We believe it is important to examine the behavior of the management of socially responsible funds. Arguably, fund managers more committed to the idea of ethical behavior or social responsibility could be expected to better achieve the desired outcome of positively affecting firm behavior. If fund mangers instead were motivated solely by

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by profit and not committed to the concept of social responsibility, they may be less determined to pursue investment that would have the desired effect on firms' actions.

A fund's fee structure and turnover ratio can provide an indication of the fund manager's commitment to ethics and social responsibility. Mutual funds committed to social responsibility should be more likely to limit the costs of trading (management fees, marketing fees, and transactions costs as a result of turnover) to investors. Mutual funds not interested in social responsibility are more likely to maximize management fees.

As noted in Cullis, Jones, and Lewis (2006), there is mixed evidence regarding the financial performance of socially responsible funds. Most evidence suggests that social funds return comparable, or lower, risk-adjusted returns relative to unconstrained firms. While the evidence one way or another is not conclusive, there may be a financial trade-off for investing in socially responsible funds. Thus, we might expect socially responsible investors to accept the chance of a financial penalty as a trade-off for realizing the non-financial utility of investing in socially responsible firms.

Sirri and Tufano (1998) suggest that investors tend to chase returns. Mutual funds that exhibit superior performance in a certain period attract higher flows into the fund the next period, other things constant. Mutual funds that exhibit inferior performance have lower flows subsequently, but the magnitude of the flow change is not as great as is seen on the positive side. Given that socially responsible investors apparently place less relative importance on financial returns than other investors, we expect that flows into and out of socially responsible mutual finds would be less sensitive to return performance, in comparison to traditional funds.

III. Data and Sample

We collected domestic socially responsible mutual funds and a matching sample of conventional mutual funds from MorningStar.com. Domestic equity ethical funds were selected using Morningstar's screening feature, and then we chose matching domestic equity funds based on fund investment styles identified by Morningstar (small, medium and large company equity growth funds; small, medium and large company equity income funds; and small, medium and large company equity blended funds). Both groups were constrained so that for any fund family (e.g., Vanguard, Franklin, etc.) only one fund was included for each of the investment styles. Fund returns and characteristics are taken from the CRSP Survivor-Biasfree U.S. Mutual Fund Database. Our sample spans January 1990 to December 2007, and yielded 120 ethical funds and 157 matching funds.

Table I provides several characteristics of the funds over the sample period, such as mean ages, size (TNA), turnover, the percentage of firms with either front-end or back-end loads, 12b1 (marketing) fees and non-12b1 (management) fees for both ethical funds and matching funds. As can be seen, the socially responsible funds are significantly younger and smaller than the control funds. The variables relating to fees and turnover

are of more interest as they are indicative of management's commitment to social responsibility.

Table I. Characteristics of U.S. Ethical Funds and Controlling Mutual Funds

This table presents the characteristics of U.S. ethical funds and the matching conventional mutual funds (control funds) during the period of 1990 to 2007. Total net assets (TNA), turnover, load, 12b1 fees (in percentage) and non12b1 fees (in percentage) are first averaged across funds each month, and then averaged over the whole time period. The turnover ratio is the minimum of aggregate purchases of securities or aggregate sales of securities, divided by the average total net assets of the fund. Load is the percentage of

	Age	TNA (Million)	12b1Fee (%)	Non12b1Fee(%)	Turnover	Load
Ethical Funds	5.47 (1.00)	109.86 (28.17)	0.32 (0.04)	1.09 (0.12)	0.73 (0.22)	0.36 (0.17)
Control Funds	8.21 (1.20)	390.95 (147.25)	0.18 (0.02)	1.14 (0.08)	0.96 (0.32)	0.47 (0.12)
Difference	-2.75*** (1.11)	-281.09*** (107.34)	0.14*** (0.03)	-0.05*** (0.10)	-0.23*** (0.28)	-0.11*** (0.15)

funds that charge either front-end load or back-end load. Age is the average life of funds in the sample, in terms of years, where fund life is defined as the time between the first and last reported monthly returns. Inside parentheses are the standard deviations. *** denotes significance at 1% level.

Marketing activities generally would be expected to benefit the fund itself more than the investors in the fund (Freeman, 2007). If socially responsible fund managers are committed to ethical behavior, we would expect 12b1 fees, associated with marketing the fund, to be lower for the ethical firms. However, 12b1 fees are significantly higher for the ethical group. This may be an indication that socially responsible funds are not fully committed to ethical behavior. Alternatively, these funds may believe that additional marketing expenses are necessary because of the unique challenges of promoting socially responsible funds. Traditional funds may be able to self-promote based on their return performance, but if social funds are perceived by investors to provide lower returns relative to comparable traditional funds, higher marketing expenditures may be necessary to keep the fund, along with its social agenda, alive.

Non-12b1 fees are significantly lower for ethical funds. This provides some evidence in support of the hypothesis that socially responsible fund managers are interested in ethical behavior. However, because of the higher 12b1 fees, total expense fees are significantly higher for the socially responsible sample.

The turnover ratio is significantly lower for socially responsible funds. This is contrasted with ethical behavior by socially responsible fund managers as it indicates that they are reluctant to pass on the additional transaction costs to investors. However, we should note that ethical funds' lower turnover may be because the ethical behavior of the firms in their portfolios is more stable than a typical firm's less predictable financial performance. So, while a company's financial performance may fluctuate greatly, causing the firm to go in and out of analysts' favor (necessitating higher portfolio turnover), the ethical/non-ethical behavior of a particular firm is likely less variable. Finally, turnover may be lower for socially responsible firms simply because there is a smaller universe of ethical firms to choose from.

Our evidence documents a significantly lower percentage of socially responsible funds charge either a front-end or back-end load. This is consistent with ethical behavior by socially responsible fund managers, especially considering the well-established negative relationship between loads and performance.

Table II reports the financial performance, in terms of monthly returns, of the ethical funds and the control sample. We observe no significant difference in either raw or risk adjusted returns for the two groups.

Table II. Performance of Ethical Mutual Funds

This table reports the average of cross-sectional fund raw returns and risk adjusted performance (Alpha). Alpha is estimated with the Carhart (1997) 4-factor model. Inside parentheses are the standard deviations.

	RawReturns	Alpha
Ethical Funds	0.79 (3.15)	-0.11 (0.66)
Control Funds	1.04 (4.24)	-0.43 (4.71)
Difference	-0.26 (3.75)	0.33 (3.33)
P-value (Difference)	0.49	0.40

Next, we examine investors' response to financial performance. We estimate the following regression equation:

$$FLOW_{i,t} = a + B_1 Expense_{i,t-1} + B_2 Size_{i,t-1} + B_3 RawRet_{i,t-1} + B_4 RawRet*EthicalDum_{i,t-1} + B_5 EthicalDum + E$$

FLOW measures the quarterly percentage growth in a fund's total net assets (TNA) as a result of new money flowing into the fund (or existing money withdrawn), after controlling for growth due to the returns earned by each fund's beginning-of-period assets. We include the control variables *Expense* and *Size*. *Expense* includes the total

expenses including 12b1 and management fees and should be negatively related to *FLOW*. *Size*, measured as the log of the total net assets of the fund in the prior period, is included since similar absolute flows will have different percentage effects on funds of different size.

RawRet is the fund's return for the preceding quarter and tests investors' responsiveness to performance. A positive coefficient would indicate that investors chase positive returns and flee from negative fund returns. We include *EthicalDum*, a (0,1) binary variable (1 = ethical fund), to control for any increase in flow into social funds unrelated to financial performance. This variable is necessary because we know that, over our sample period, investment in socially responsible mutual funds became a much more accepted investment practice. An increase in social awareness by investors could create significant inflows to ethical funds unrelated to financial performance. We include the interaction term *RawRet*EthicalDum* to test for differential responses to financial performance by socially responsible investors. *RawRet*EthicalDum* is the focal point of the regressions because it most directly measures the commitment of ethical investors.

Table III provides the regression results. In Panel A, financial performance is measured by raw returns. We observe similar results to Sirri and Tufano (1998) in that investors, in general, appear sensitive to a fund's financial performance. This can be seen by the positive and significant coefficient for *RawRet*. Periods of superior performance lead to higher levels of new money flowing into the funds, while negative returns tend to reduce fund flows. As expected, *Size* lowers the flows when they are measured as a percentage change and ethical funds (*EthicalDum*) exhibit statistically significant growth over the study period independent of fund performance.

The negative and significant coefficient for *RawRet*EthicalDum* provides support for our hypothesis that investors in socially responsible mutual funds are less sensitive to financial performance than traditional fund investors. This result may be interpreted as ethical fund investors being committed to a socially responsible agenda in that they are willing to "stay the course" with little regard to fund returns. As shown in Panel B, where performance is measured by market-adjusted returns, these conclusion are robust with regard to the performance metric.

Table III. Past Performance and Fund Flows

This table reports the quarterly Fama and Macbeth (1973) cross-sectional estimation of fund flows on the fund's past performance. Fund flows is defined as $FLOW_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} * (1 + R_{i,t})_{i,t}}{TNA_{i,t-1}}$ where $TNA_{i,t}$ is fund *i*'s total net assets during the last quarter t; $R_{i,t}$ is the fund's compounded return during last quarter. This flow measurement reflects the percentage growth of a fund in excess of the growth if there was no change in fund flows, after controlling for fund merging activities. Significance levels are noted at the .01 (***) and .05 (**) levels.

A. Pooled Regressions:
Using Raw Returns as Control Variable

Expense	3.23	
Tstat	1.17	
Size	-0.04	
Tstat	-3.82	***
RawRet	2.67	
Tstat	3.50	***
Ret*EthicalDum	-2.62	
Tttat	-2.78	***
EthicalDum	0.19	
Tstat	2.69	***
adjrsq	0.12	

B. Pooled Regressions:
Using the Abnormal Returns (Raw Returns-Market Returns) as Control Variable

Expense	10.92	
Tstat	4.74	***
Size	-0.02	
Tstat	-3.41	***
RawRet-Mkt	1.31	
Tstat	3.60	***
Ret*EthicalDum	-1.33	
Tstat	-2.19	**
EthicalDum	0.09	
Tstat	1.78	**
adjrsq	0.09	

IV. Conclusions

We examine the fee structures and turnover ratios of socially responsible mutual funds in order to determine the degree of management commitment to social responsibility. We find support for this in that a smaller percentage of ethical funds charge front-end or back-end loads, and turnover ratios and management fees are lower for ethical funds. However, 12b1 marketing fees are higher for ethical funds. This may indicate a lack of concern for ethics by these managers, or that ethical funds may require more marketing because of their newness or perceptions that they provide inferior performance.

In terms of investor response to financial performance, we find evidence to suggest that investors in socially responsible firms are not as concerned with financial performance as more traditional investors. While traditional investors chase positive performance, socially responsible investors do not seem to exhibit this behavior, or at least not to the degree that other investors do. We conclude, therefore, that these investors are committed to their social agendas.

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Enriching a Personal Finance Class with Free Online Video Clips

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Abstract

In spite of the fact that many of the video clips available at YouTube and other video providers are designed for entertainment, an increasing number are educational in nature. Extensive searching by the author revealed a multitude of videos relating to the topics covered in a personal finance course. The purpose of this paper is to provide a topical video guide to professors of personal finance interested in utilizing video clips as a teaching tool. Various approaches to the effective use of video clips in the classroom are also suggested.

I. Introduction

In February of 2005 a company was founded in a garage in Menlo Park, California. The company and the service it offers were officially launched in December of 2005. A little less than a year later in November, 2006 this company was acquired by Google for $1.65 billion and now operates as an independent subsidiary. It's probably no surprise to many that the company just described is YouTube, the leader in online video.

Even though You Tube was not the first to offer online video, its success has certainly led to a dramatic increase in the number and variety of online video clips available. According to industry statistics, YouTube has approximately 20 million unique visitors monthly and serves 3 billion minutes of video every month and 100 million videos daily. YouTube serves 60 percent of all videos viewed.

II. Literature Review

Before proceeding to the video guide, a review of the literature relating to visual learning and the use of video clips is in order.

Educators have long recognized the importance of appealing to multiple senses to enhance learning. Blackboards, whiteboards, films, bulletin boards, posters, and overhead projectors are some of the resources used to appeal to the visual sense of students. With the widespread availability of computers and high speed Internet, many schools now have classrooms which enable professors to access and project Web pages, show video clips, etc. Even if the Internet is not directly available in the classroom, materials for use in the classroom and be downloaded to files and shown.

The majority of research in the use of visuals indicates that they aid in the learning process. Lambert and Carpenter (2005) point out, "Say it with words and you're lucky if they hear it or bother to read it. Tell your story with imagery, and its grabs attention, evokes emotions, and is processed." Hodges (1994) indicates that "visuals help learners isolate and identify important material, recall prior knowledge, provide interaction with content, and

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enhance information content." Dyck (2006) emphasizes that "video can prompt discussion, inspire writing, and create emotional connections that will stick with students for a long time." However, Sherry (1996) cautions that to be effective an analysis of the underlying meaning conveyed by the visual must be emphasized rather than the exciting or entertaining aspects of the presentation. Williams and Dwyer (1999) stress that just seeing does not maximize student achievement. Simmons (2004) argues that in the past there has been a great emphasis upon teaching students how to analyze text, but in light of today's highly visual environment increased emphasis needs to be placed on learning how to analyze images.

Hoover (2006) in using video clips in a United States History class found that 60 percent of students indicated they had used the videos as a learning device. An interesting finding highlighted in the survey of students was that 17 percent of freshmen and sophomores had used the clips in preparation for a test while over 60 percent of juniors had done so. Approximately 70 percent of students felt the clips had improved their overall attitude toward the class. For example, one of the 60 students in the two class sections surveyed noted, "I've never found history very interesting. The . . . clips made me want to come to class, and even more, PAY ATTENTION!!" Choi and Johnson (2005) in a study comparing text-based instruction and video-based instruction in an online course found that video-based instruction was more effective in helping students remember content as well as in holding their attention.

Cardine (2008) points out that several well known academic institutions (such as UC Berkeley, University of Southern California, Northwestern, Harvard Kennedy School, Vanderbilt, and Carnegie Mellon) have entered into agreements with YouTube which enable them to establish channels where faculty, students, and staff can post video clips. Kinzie (2007) emphasizes that some professors from major universities are even making their lectures freely available on YouTube. Such channels over time may greatly increase the educational video clips available to professors.

An aspect of using online videos that should not be ignored by potential users is the copyright issue. Prior to utilizing YouTube and other similar on-line video providers, professors should validate that their intended use of the videos will not violate another's copyright interest. In recent years, copyright holders have invested tremendous resources in protecting their copyrighted works that exist on peer to peer networks. A good example is the over 20,000 lawsuits filed by the Recording Industry Association of America against individuals who utilized free online recordings rather than purchasing CDs (Fisher, 2007). Similar lawsuits have been and will likely continue to be lodged against those who violate copyright law when using online videos. While the intersection of technology, copyright, and educational fair use is beyond the scope of this article, Das (2000) offers a thorough summary of these issues for those who want more in depth coverage of this extremely important topic.

III. Suggestions for Use of Video Clips

There are many ways in which video clips can be used to enrich a personal finance class. Student learning can be facilitated and enhanced in the following ways with the strategic use of videos.

1. Introducing the terminology of a new section. A good way to start a new topic of study is to show a video clip which introduces the student to the terminology with which they must become acquainted. For example, a short video on auto insurance can be utilized to introduce such terms as liability, collision, comprehensive, limits, deductibles, etc.
2. Stimulating discussion either in a class or small group setting. For instance, a video on auto insurance could serve as a springboard for a thorough discussion of the types of auto insurance.
3. Heightening student interest and attention. Even if a professor is an outstanding lecturer, his students will likely welcome the opportunity for a new approach to learning. In addition, videos appeal to the visual as well as auditory senses of students.
4. Having an "expert guest speaker" without the logistics involved in having one physically present. Many videos feature nationally recognized experts which the professor would likely be unable to attract as a guest speaker. Experts who offer advice similar to that given earlier by a professor reinforce the professor's credibility in the eyes of students.
5. Pausing or replaying videos. One very attractive feature of video clips is that they can be paused immediately after the presentation of a particular concept to allow the professor to elaborate or students to ask questions. Also, segments can be replayed if it appears students did not comprehend what was presented.
6. Utilizing video clips as an effective study aid. Since videos are available on the Web, students can access them on their own time as often as they wish. Students find this form of study much easier than reading from the text or their notes. Also, students may be more prone to use videos because they contain an entertainment component.

Even though the entertainment aspect of videos may appeal to students, it can perhaps be the biggest problem a professor must overcome in using video clips. Since over their lifetimes students have spent so many hours watching television, they often have the tendency to view the clips passively. The minds of some students seem to automatically disengage when a professor shows a video. To overcome this tendency, a professor should show a video with clear objectives in mind. The professor should ask, "What learning outcomes do I expect from using the video?" Before showing a video, the professor should introduce it, explain how it relates to the subject matter being studied (or the chapter students have read), and inform them that they will be expected to provide oral or written feedback concerning the content of the video. One last point which should be obvious is that a professor should never play a video in class without first having previewed it.

Topical Video Guide

The following guide provides a link to each video, a brief description of the content of the video, and the length of time for which the video runs. Videos which have tended to be most useful in teaching personal finance are preceded by the following designation: ***. For those interested, an electronic copy of this paper with active links can be accessed at the following address: http://www.obu.edu/business/arye/videopaper.htm.

Auto Insurance:

****Auto Insurance Quiz* http://www.iii.org/individuals/videos/ Important questions about auto insurance are asked members of the public and explained if the answers provided are not correct. (This video has no address of its own; it will be necessary to review the video listings which

appear when the URL provided is accessed. The video is located near the end of the listings) Time: 5:06

******Five Things You Need to Know about Auto Insurance*** http://www.blinkx.com/video/5-things-you-need-to-know-about-auto-insurance/Y0t17-faxE0hJsdB01zIWg Kimberly Lankford, contributing editor of *Kiplinger's* Personal Finance Magazine, shares some ways to save money on auto insurance. Time: 2:59

Banking and Bank Reconciliation:
Summer Dye: How to Balance a Checkbook http://www.expertvillage.com/expert/1644.htm This is a series of short video clips on the following subjects: Balance a Checkbook to a Bank Statement, How to Balance a Checkbook, How to Balance Outstanding Checks, How to Find the Best Checking Account, How to Fix Bank Fraud, How to Fix Bank Statement Errors, How to Reconcile a Checkbook, How to Settle Bank Discrepancies, How to Spot Errors in a Bank Statement, How to Understand Your Bank Statement, How to Use a Checkbook Register, How to Write a Check, Tips on How to Reconcile a Checkbook, What to Put on a Bank Check, What You Need to Balance a Checkbook. Time: Approximately 2:00 to 4:00

How to Balance Your Checkbook http://www.videojug.com/film/how-to-balance-your-checkbook This video goes step-by-step through the reconciliation process. Time: 3:06

Bond Investing:
Investment Bond Basics http://www.videojug.com/interview/investment-bond-basics Scott Leonard, CFP, RIA, founder and president of Leonard Wealth Management, answers the following questions: What Are the Pros and Cons of Investing in Bonds? Are Bonds Always Safer Investments Than Stocks? What Is a "Bond Swap"? What Is a "Bond Rating"? What is "Moody's"? What Is "Bond Yield"? What Is "After-Tax Yield"? Time: 4:35 Each question can be accessed and viewed separately; the longest answer is 00:46; the shortest is 00:14.

Choosing a Bond Investment http://www.videojug.com/interview/choosing-a-bond-investment Scott Leonard, CFP, RIA, founder and president of Leonard Wealth Management, answers the following questions: What are the top things investors should know about investing in bonds? What are the most common mistakes people make when investing in bonds? What are the key factors to consider when investing in bonds? What market factors impact bond value and rates of return? Time: 3:43 Each question can be accessed and viewed separately; the longest answer is 1:24; the shortest is 00:36.

Budgeting:
******Five Easy Ways to Budget*** http://www.brightcove.tv/title.jsp?title=1150778034&channel=174424181&lineup=1152290526 Janet Bodnar, Deputy Editor of Kiplinger Personal Finance Magazine, makes the following budgeting suggestions: track your expenses, make it personal, psyche yourself out, get someone to save for you, and have a goal. Time: 3:01

******How to Create a Household Budget*** http://www.videojug.com/film/how-to-create-a-household-budget The steps in creating a budget are discussed. Time: 2:37

***Envelope System Tutorial* http://www.youtube.com/watch?v=mwtkD5KXihw How to use the envelope budgeting system is detailed. This method often appeals to young people due to its simplicity. Time: 3:53

How t*o Budget Personal Finances* http://www.expertvillage.com/interviews/set-budget.htm This is a series of short video clips on the following subjects: What is a Personal Finance Budget; Why You Should Use a Budget; How to Start a Budget; How to Evaluate Your Current Spending; How to Track Your Expenses; How to Maintain a Budget; How to Use the Envelope System to Manage your Budget; Cash, Credit, or Debit? Personal Budget Tips; Ideas for Cutting Back on a Budget; Resources for Creating a Budget; How to Use Quicken or Microsoft Money; Online Resources for Personal Finance Budgeting; Why Budgets Fail; Using a Budget at Home and at Work. Time: Approximately 2:00 to 3:00

***Don't Buy Stuff* http://www.hulu.com/watch/1389/saturday-night-live-dont-buy-stuff This Saturday Night Live segment presents in a very entertaining way a sure-fire method for getting out of debt. Time: 2:28

Car Buying:

Car Finding Basics http://www.videojug.com/interview/car-finding-basics James Bell, an auto reviewer, answers the following questions: How Do I Find the Right Car? What Should I Consider when Buying a New Car? Should I Buy a New or Used Vehicle? What are the Biggest Mistakes in Choosing a New Car? Should I Consider My Environment when Buying a Car? How Important is Fuel Economy when Buying a Car? (Other questions are answered on the advantages and disadvantages of SUVs, convertibles, luxury cars, and classic cars, as well as the difference between a standard and automatic transmission if the professor wants to show them) Time: 4:55 Each question can be accessed and viewed separately; the longest answer is 1:09; the shortest is 00:38.

How to Buy a Car? http://www.edmunds.com/video/howtos.html# This series of videos includes the following: Initial Decisions, Pricing, The Test Drive, Trading In, Making the Deal, Closing the Deal, Buying a Used Car, Purchasing Alternatives, Leasing. The use of tools provided on the Edmunds Web site is emphasized. Time: Around 3 minutes per video.

***Buying a Car in Cyberspace* http://abcnews.go.com/Video/playerIndex?id=3463151 Barbara Terry, auto expert, provides tips for buying a car online. Time: 4:37

How to Sell a Car? http://www.edmunds.com/video/howtos.html# Three subjects are covered in three separate videos: Setting the Selling Price, Your Selling Options, Conducting the Sale. The use of tools provided on the Edmunds Web site is emphasized. Time: Around 3 minutes per video

***How to Negotiate with a Car Salesman* http://www.videojug.com/film/how-to-negotiate-with-a-car-salesman Ten steps to successfully negotiating the price of a car are highlighted. Time: 3:42

Credit (establishing credit, credit reports, and credit scores):
***Establishing Credit* http://www.creditlearningcenter.com/display.php?content_id=63 Walter Burch, editor of CreditLearningCenter.com, discusses three steps for establishing credit. Time: 1:24

***What's in Your Credit Report?* http://www.creditlearningcenter.com/What-is-in-Your-Credit-Report.html Walter Burch explains the role of credit bureaus and the categories of information included in a credit report. Time: 4:39

How to Read a Credit Report http://video.about.com/credit/How-to-read-a-credit-report.htm Don Schechter with about.com Money discusses how to decipher a credit report and report mistakes discovered. Time: 3:54

***Understand Your Credit Score* http://www.creditlearningcenter.com/Understanding-Your-Credit-Score.html Walter Burch explains the importance of credit scores and the weighting of information in determining credit scores. Time: 5:38

Credit Cards:
***Avoiding the Credit Card Monster* http://www.creditcard.fsu.edu/video.html This video created by students at Florida State University provides some sound advice to college students on managing their financial affairs. Especially entertaining but informative are the "Top Ten Reasons to Not Have a Credit Card." Time: 10:00

Managing Credit Cards: Planning to Prosper http://www.edfund.org/real/managing_credit_cards/index.cfm The first segment of this video is Credit Card Basics (advantages and disadvantages of credit cards, and the difference between debit and credit cards); the second segment is Using Credit Cards (difference between needs and wants, consequences of making minimum monthly payments, and understanding APR, grace period, and fees). Time: Approximately 2:00 for the first segment and 5:00 for the second

Credit Card Traps http://www.brightcove.tv/title.jsp?title=958529475&channel=174424181 Credit card fees and interest rate traps are discussed, as well as how to avoid them. Time: 1:49

Young and in Debt http://www.brightcove.tv/title.jsp?title=1078597542&channel=494910443 This video highlights the growing debt among young people and their lack of financial knowledge. Time: 1:45

Want a Lower Interest Rate: Just Ask http://video.msn.com/dw.aspx?mkt=en-us&from=truveo&vid=9da804d1-bc2a-4474-85cb-2db3436aa109 This video stresses that credit card companies will often lower your rates if you ask. Time: 1:30

Disability Insurance:
***Shopping for Financial Security* http://www.youtube.com/watch?v=qEkOo9voDd0 The importance of having disability insurance is emphasized through the illustration of a young couple dealing with the severe illness of the wife. Time: 4:00

Disability Insurance Basics http://www.videojug.com/interview/disability-insurance-basics Elliot Matloff, President of the Matloff Company, answers the following questions: What is disability insurance? Do I need disability insurance? When should I consider buying disability insurance? How do I determine how much disability insurance I need? What are the basic types of disability insurance? What is a residual claim? What does renewability mean, and how does it affect me? What is presumptive disability insurance? What is a cost-of-living rider? What is the CPI, or Consumer Price Index? What is benefit period? What is elimination or waiting period? Time: 9:50 Each question can be accessed and viewed separately; the longest answer is 1:56; the shortest is 00:24.

Emergency Fund:

Got an Emergency Fund http://www.blinkx.com/video/got-an-emergency-fund/-uUchbByhT597Vy9Mj8h8Q The amount needed for an emergency fund and where to invest the funds are discussed. Time: 1:36

Financial Planning:

Financial Documents for Young Families http://video.aol.com/video-detail/financial-documents-for-young-families/558866735 The importance of drafting a will, setting up a trust, and getting term life insurance are emphasized. Time 3:36

****Financial Checklist for Your 20s* http://www.brightcove.tv/title.jsp?title=1184496023&channel=174424181 Erin Burt, Contributing Editor for Kiplinger.com, offers five steps for getting off on the right foot financially during your 20s. Time: 2:27

How Long Should I Keep My Financial Records? http://www.iquestions.com/video/view/212 Financial planner Ron Blue gives advice on which records need to be kept and for what length of time. Time: 00:42

I Don't Know What a Financial Planner Does? http://youtube.com/watch?v=IShpiQhO7Cs This video explains how financial planners help people manage their financial affairs. Time: 5:42

Personal Finance 101 http://www.smartmoney.com/smartmoneytv/?vid=1155199837 Three things every college student should know about money are highlighted. Time: 2:51

Health Insurance:

****Insur – Animals #!* http://www.youtube.com/watch?v=s-Cn2PZUndY This animated video spoofs the health care system but in the process introduces such terms as the following: deductibles, co-pays, pre-existing conditions, and premiums.

****Health Insurance Basics, Part1* http://www.healthination.com/Videos/Health-Insurance-Basics The two major providers of health insurance and the two major types of health insurance (fee for service and managed care) are discussed. Time: 2:52

****Health Insurance Basics, Part 2* http://www.healthination.com/Videos/Health-Insurance-Basics Health insurance terminology such as premium, out-of-pocket expenses, co-pays, co-insurance, deductibles, spending caps, etc. are explained. Time: 3:22

***_Shopping for Health Insurance_ http://www.healthination.com/Videos/Health-Insurance-Basics The features, advantages, and disadvantages of fee for service plans and managed care (HMOs, PPOs, and POSs) are contrasted. Time: 4:57

Health Insurance at Every Stage of Life http://www.brightcove.tv/title.jsp?title=715965795&channel=174424181 This video makes suggestions for ways students can continue health insurance coverage after graduation, as well as how workers who begin drawing Social Security before full retirement age can have health coverage. Time: 2:48

Home Buying:

How Much Home Can You Afford Loan http://keybank.mindblazer.com/(S(zc4pxy55yp2vq045ttfwtx45))/first-time-home-buyers/dmc.aspx?vBW=_hi This video relates the five Cs of credit to buying a home. Time: 3:16

***_How to Buy a Home_ http://www.brightcove.tv/title.jsp?title=823481214&channel=627035070 Nine steps to buying a home are discussed. Time: 9:21

Homeowner's Insurance:

***_Homeowner's Insurance Quiz_ http://www.iii.org/individuals/videos/ Important questions about homeowner's insurance are asked members of the public and explained if the answers provided are not correct. (This video has no address of its own; it will be necessary to review the video listings which appear when the URL provided is accessed. The video is located near the end of the listings) Time: 4:47

***_Home Insurance_ http://tniq.com/clientwebsites/neamb/homeowner_insurance This video outlines the features and coverages of a homeowner's insurance policy. Time: 4:39

Five Things You Need to Know about Homeowner's Insurance http://www.brightcove.tv/title.jsp?title=1148215466&channel=174424181 Kimberly Lankford, contributing editor of _Kiplinger's_ Personal Finance Magazine, explains how to get homeowner's insurance at the best price. Time: 3:13

College Students Quiz http://www.iii.org/individuals/videos/ This video highlights the importance of making sure personal possessions taken to college are insured. (This video has no address of its own; it will be necessary to review the page of video listings to find it; the video is near the end of the listings.) Time: 4:11

Identify Theft:

***_Defer. Detect. Defend Avoid ID Theft_ http://www.ftc.gov/bcp/edu/microsites/idtheft/ Overall, the author considers this the best video on identity theft. Time: 10:20

***_James Bierstaker Forensic Accounting_ http://www.youtube.com/watch?v=1YCrnMpelmg The importance of students not putting their personal information on Facebook is emphasized. Time: 1:37

Nine Ways to Protect Yourself from IdentityTheft http://www.creditlearningcenter.com/Nine-Ways-to-Protect-Yourself-from-Identity-Theft.html Walter Burch, editor of CreditLearning Center.com, discusses nine important steps to preventing identity theft. Time: 4:19

A Great New Way to Fight Identity Theft http://www.dolans.com/video/DOEL_great_new_way_to_fight_id_theft.html Daria Dolan contrasts fraud alerts and a newer technique, credit freezes, for minimizing the damage once you realize you have become a victim of identity theft. Time: 4:32

Life Insurance:

****Life Insurance 101* http://www.lifehappens.org/insurance-101-videos/life The following questions are discussed in this video: Who needs life insurance? How much life insurance do I need? What kind of life insurance should I buy? Time: Approximately 10:00

Life Insurance Quiz http://www.iii.org/individuals/videos/ Important questions about life insurance are asked members of the public and explained if the answers provided are not correct. (This video has no address of its own; it will be necessary to review the video listings which appear when the URL provided is accessed. The video is located near the end of the listings) Time: 3:34

Five Things You Need to Know about Life Insurance http://www.starpulse.com/Television/Life_As_We_Know_It/Videos/?vxChannel=&vxClipId=&video_title=5+Things+You+Need+to+Know+about+Life+Insurance&video_count=2 Kimberly Lankford, contributing editor of *Kiplinger's* Personal Finance Magazine, explains how to get the best life insurance at the best price. Time: 2:50

Mortgages:

Types of Mortgages-Bloomberg: Your Money http://www.youtube.com/watch?v=qLGm_M24WIE This video reviews 30 year fixed-rate mortgages, adjustable-rate mortgages, and hybrid mortgages. Time: 2:55

Getting the Best Home Loan http://keybank.mindblazer.com/(S(uqwryk45hbgfbnz3zsf5ig3d))/first-time-home-buyers/dmc.aspx?vBW=_hi Five questions which should be answered in order to get the best home loan are reviewed. Time: 3:30

Mutual Funds:

Mutual Fund Basics http://www.videojug.com/interview/mutual-fund-basics Scott Leonard, CFP, RIA, founder and President of Leonard Wealth Management, answers the following questions: What is a mutual fund? What are the pros and cons of investing in mutual funds? What are the fees and costs I pay to invest in mutual funds? What is a load fund? What is a no load fund? What is a 12b-1 fee? What is a fund manager? What are the most common mistakes people make when investing in a mutual fund? Are mutual funds a safer investment than individual stocks? Time: 10:52 Each question can be accessed and viewed separately; the longest answer is 3:16 and the shortest is 00:26.

***How to Pick a Mutual Fund http://www.blinkx.com/video/how-to-pick-a-mutual-fund/wpIRap8crNgCTnvo9FYoVg The importance of investment goal, management tenure, and the assets of a mutual fund are emphasized. Time: 1:29

Retirement:

Planning for Retirement: Start Young http://www.cbsnews.com/stories/2006/03/15/earlyshow/contributors/raymartin/main1405272.shtml This video emphasizes the importance of starting early and taking advantage of employee matching. Time: 2:35

Fixed vs. Variable Annuities http://www.iii.org/individuals/videos/ This video discusses the basics of annuities and the various types. (This video has no address of its own; it will be necessary to review the page of video listings to find it. The video is near the bottom of the list.) Time: 2:10

Five Best Ways to Save for Retirement http://www.blinkx.com/video/5-best-ways-to-save-for-retirement/Tfsnyb8J6Q1v5xcuVRRq3g Mary Beth Franklin, Senior Editor for Kiplinger's Personal Finance Magazine, makes five suggestions for effective retirement planning. Time: 2:16

Stocks and Investing in General:

***Invest It's Best* http://www.youtube.com/watch?v=Yw0wgOCvTjo This is a music video that is kind of juvenile but is very enjoyable and has a great message. Time 4:34

Terry Savage: How Can I Invest Without a Lot of Money? http://www.youtube.com/watch?v=UFtZtftAti0 Investing in mutual funds with low required opening balances, buying stocks using shareholder.com are two of several ways suggested to invest with a small amount of money. Time: 1:15

***How to Understand the United States Stock Market* http://www.videojug.com/film/how-to-understand-the-us-stock-market Four steps to understanding the stock market are reviewed: Step 1 Begin with the Basics; Step 2 Buy Low, Sell High; Step 3 Do Your Homework; Step 4 Keep an Eye on Things. Time: 1:55

Investing Basics http://www.videojug.com/interview/investing-basics Scott Leonard, CFP, RIA, founder and president of Leonard Wealth Management, answers the following questions: What is an investment? What is an investment portfolio? What is a stock? What is a bond? What is a mutual fund? What is a dividend? Do all companies pay dividends? What is a Treasury note? What is an asset class? What is asset allocation?) Time: 4:36 Each question can be accessed and viewed separately; the longest answer to a question is 00:49; the shortest is 00:13.

Stock Investing Strategies http://www.videojug.com/interview/stock-investing-strategies Scott Leonard , CFP, RIA, founder and president of Leonard Wealth Management, answers the following questions: What factors should I consider in making investing decisions? What is the power of compounding? What is dollar-cost averaging? What are the advantages and disadvantages of dollar-cost averaging? What is investing on margin? What are the pros and

cons of investing on margin? What is a call provision? What is an option? What is the difference between trading an option and writing an option? What is shorting? What is day trading? Is day trading riskier than other form of investing? What are the pros and cons of online trading? What are market trends and how should they impact my trading decisions? Should I invest in foreign companies? What is liquidity? What percentage of my money should I keep in cash? What is tax loss selling? Should I follow advice of the TV and magazine investment experts? What are the key facts investors should know about investing in stocks? What are the top mistakes people make when investing in stocks? Time: 18:58 Each question can be accessed and viewed separately; the longest answer to a question is 1:30; the shortest is 00:31.

Student Loans:

How to *Get the Best Deal on Student* Loans http://www.blinkx.com/video/how-to-get-the-best-deals-on-student-loans/RPvPGpk13HXUklKOwYtl3w Janet Bodnar, Deputy Editor of Kiplinger's *Personal Finance* Magazine, emphasizes the importance of seeking Federal aid. Time: 2:45

Paying Off Your Student Loans http://www.youtube.com/watch?v=dSYzHJ1EmWo Janet Bodnar, Deputy Editor of Kiplinger's *Personal Finance* Magazine, suggests ways to get a reprieve if needed on paying student loans. Time: 2:57

Taxes:

*********How to Electronically File a Tax Return* http://www.videojug.com/film/how-to-electronically-file-a-tax-return Three steps to filing a tax return electronically are outlined. Time: 3:03

*********How Should I Prepare for My Taxes?* http://www.iquestions.com/video/index?media_id=213 Financial Planner Ron Blue emphasizes the importance of not having your employer over withhold income taxes—give the government an interest free loan. Time: 1:24

TaxDefined http://www.videojug.com/interview/tax-defined John Stoller, CPA, answers the following questions: What I need to know about taxes? What are income taxes? Who needs to file income taxes? What is the IRS? Where do my taxes go? What are tax favored investments? Why are the tax laws so complicated? What's new this year in the tax law? What is total tax? What's a dependent? What's a deduction? What are state taxes? What does tax deductible mean? What's taxable income? What's a marginal tax rate? Time: 12:10 Each question can be accessed and viewed separately; the longest answer is 1:42; the shortest is 00:12.

Tax Returns: Getting Started http://www.videojug.com/interview/tax-returns-getting-started Steven J. Duben, CPA, answers the following questions: How do I get started doing my taxes? Where can I find tax forms? Where can I find great reference materials? Can I get help with my taxes from the IRS? Should I use tax preparation software? What are the advantages of filing

electronically? How can I file my taxes electronically? How many taxpayers get audited? What should I do if I am missing receipts? Time: 5:00 Each question can be accessed and viewed separately; the longest answer to a question is 1:03; the shortest is 00:20.

Five Things You Must Know about Taxes and Your Investments http://www.brightcove.tv /title.jsp?title=1152288032&channel=174424181&lineup=1152290526 Kevin McCormally, Editorial Director of Kiplinger Publications, points out five ways of managing investments to minimize taxes.

IV. Conclusion

The video topical guide provided in this paper should be helpful to professors desiring to utilize online video clips as a teaching aid in their personal finance classes. The guide should also prove beneficial to anyone wanting to learn more about personal finance. As time passes the guide will become less useful due to outdated content, changing URLs, etc. However, assuming the availability of video clips increases as it has over the last two or three years, professors desiring to use video clips will easily be able to find new and better video clips at one of the video "supersites" which follows: You Tube (http:// www.youtube.com), Video Jug (http://www.videojug.com), Google Video (http://video.google.com), Yahoo Video (http://video.yahoo.com) AOL Video (http://video.aol.com), MSN Video (http://video.msn.com) SuTree (www.sutree.com), Brightcove TV (http://www.brightcove.tv), Smart Money TV (http://www.smartmoney.com/smartmoneytv).

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NASDAQ Sector Returns and Market Conditions

Jayen B. Patel

Abstract

This study compares stock returns for NASDAQ sector indices over varying market conditions. The results reveal that, during relatively shorter periods of time, some sectors have generated statistically significantly greater mean monthly returns than those of other sectors. However, for the overall recent ten-year period 1998 through 2007, there were no statistically significant differences between any two NASDAQ sectors. These results therefore indicate that individual long-term investors should not re-allocate funds among sectors based on varying short-term market conditions.

I. Introduction:

Since investors have numerous alternatives available to them in many sectors of the stock market, it is important to examine and understand equity return performance, not only for broad composite indices, but also for various sector indices. An understanding of the performance of various sectors in recent years may be an important component of equity analysis for many individual investors. In particular, the performance of individual sectors over varying market conditions can be important to investors in several ways. First, it will inform investors about relative sector performance during up-markets and down-markets. Investors can then determine which sector returns are more (or less) sensitive to market downturns. Second, this analysis provides insight for investors so that they can re-allocate resources to those sectors that are least sensitive to economic downturns. Finally, this analysis allows us to more thoroughly compare sectors in order to determine whether any particular sector consistently outperforms others over varying market conditions.

This study first examines and compares the performance of the sectors of the NASDAQ Composite index during a recent ten-year period. Second, the performance of each sector during two different market scenarios, up-markets and down-markets, is determined during this period. Then, the study investigates whether any particular sectors are relatively less integrated with the remaining sectors under the two market conditions. For the short-term, investors may obtain diversification benefits by re-allocating funds to sectors that are less correlated with the remaining sectors. Finally, the re-allocation issue from a long-term investment perspective is investigated; that is, it is examined whether any sector outperforms others over a longer holding period.

This paper is organized as follows. The literature relevant to this study is discussed in the next section. The following section presents the data used in the study, and the subsequent section discusses empirical findings. The final section provides conclusions and summarizes the major findings.

II. Literature Review:

Eakins and Stansell (2007) examine various rebalancing strategies based on investments in sector funds. They studied nineteen sector funds over the period December 1995 through

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December 2002, and concluded that investors should rebalance frequently so that their portfolios are not over-weighted in a particular sector fund. They indicate that even investors who maintain well-diversified portfolios improve their risk protection with rebalancing. Since relative fund performance can vary substantially from one year to the next, investors are well-served by rebalancing portfolios among the various sectors.

Sassetti and Tani (2006) note the equity markets' negative returns during the recent three year period (2000 through 2002), and conclude that it is critical for investors to develop strategies to outperform the market during extended periods of poor performance. Since returns for various sectors follow differing patterns over time, they conclude that investors should pay attention to sector rotation, which can result in outperforming the benchmark in the long run.

Ewing and Malik (2000) investigate the performance of various sectors, relative to that of the overall market, because it is important for investors to determine whether this relationship changes over time. The authors examine risk-return relationships among S&P sector indices for time periods before and after the 1987 market crash. They observe that, because relative volatility of some sectors compared to the market may change after major events, investors should revisit their investment allocations after major economic events.

In a later study, Ewing, Forbes and James (2003) explain that the popularity of index investing in sector specific funds prompted their investigation of the impact of macroeconomic shocks on sector returns. They examined five S&P sector specific indices during the post-crash period 1988 through 1997.

Ratner, Meric and Meric (2006) observe that, because investors do not invest equally in various equity sectors, a disparity of information may exist among these sectors. It is therefore possible that economic expansions and recessions have differential effects on sector returns.

Taing and Worthington (2005) examined relationships among five equity sectors in six European countries during the period 1999 through 2002, and found that few sectors exhibited significant interrelationships with other sectors. The authors conclude that these results indicate opportunities for diversification by sector in the European Union markets.

Chan, Lakonishok and Swaminathan (2007) state that industry classifications are commonly used to create homogenous stock groups for comparison purposes. They add that industry effects are relatively stronger for larger firms than for smaller firms.

Prior research indicates that larger firms appear to have more pronounced sector effects than do smaller firms. Therefore, this study hypothesizes that NASDAQ sectors may be relatively less integrated with each other, so that investors may have the opportunity to diversify. Further, in recent years, investors face increased offerings among investment alternatives representing various equity sectors. Recognizing the importance of these opportunities, NASDAQ sectors are examined in this paper over a recent ten-year period. The description of the data for this study is in the following section.

III. Data:

In this study, the NASDAQ Composite index is used to represent a broad-based market index. The NASDAQ Composite index measures returns for a portfolio of over 3,000 publicly traded stocks, and is therefore widely followed and quoted in the media. The *Wall Street Journal* (WSJ) reports performance of the NASDAQ Composite, along with some of its component indices, as a major U.S. stock market index. The NASDAQ website provides data for the seven sub-indices examined in this study:

- The NASDAQ bank index.
- The NASDAQ computer index.
- The NASDAQ industrial index.
- The NASDAQ insurance index.
- The NASDAQ other finance index.
- The NASDAQ telecommunications index.
- The NASDAQ transportation index.

This study emphasizes relatively recent data; specifically, the sample period is the ten-year period from January 1998 through December 2007. The data is comprised of NASDAQ index values, resulting in 120 monthly observations for each index. A summary of empirical results is reported in the next section.

IV. Empirical Results:

Table 1 reports return characteristics for the seven NASDAQ sector indices and the NASDAQ composite index for the period January 1998 through December 2007. For the overall period, the following four sector indices generated monthly returns greater than the returns for the composite (0.77 percent): the computer (1.12 percent), transportation (0.95 percent), other finance (0.92 percent) and industrial (0.78 percent) indices. The insurance index returns (0.77 percent) were identical to those of the composite, while the telecommunications (0.35 percent) and bank (0.29 percent) index returns were substantially less than those of the composite.

Total risk, measured by the standard deviation of returns, for the computer (10.10 percent) and telecommunications (9.84 percent) indices was greater than the total risk of the composite index (8.15 percent). Standard deviations for the remaining sector indices were lower than the standard deviation of the composite index. It should be noted that the bank, insurance and transportation sector indices exhibited substantially lower standard deviations compared to those for the other four sector indices. Also, the transportation sector index has higher risk and return than the bank and insurance sector indices. In addition, the coefficient of variation (i.e. risk divided by return) for each sector, other than the bank and telecommunication sectors, is lower than that of the composite index.

In Table 2, mean monthly returns for the NASDAQ composite index and for each of the seven sector indices are reported by calendar year for each year of the sample period 1998 through 2007. As expected, the NASDAQ composite index results indicate negative returns for the three consecutive years 2000, 2001 and 2002, and positive returns for the remaining years, 1998, 1999, and 2003 through 2007. In contrast to the composite index, however, the insurance,

transportation and bank sector indices do not generate negative returns from 2000 to 2002. The four remaining sector indices do generate negative returns during the period 2000 to 2002 when the composite index produced negative returns as well.

The primary objective of this study is to compare performance of the NASDAQ sector indices based on market conditions. Accordingly, two sub-periods were created: the first sub-period represents down years for the composite (the years 2000, 2001 and 2002) and the second sub-period is comprised of the seven up years of the sample period. Thus, these sub-periods contain thirty-six and eighty-four monthly observations, respectively.

Table 3 displays performance for each of the seven sector indices during up years and down years, respectively. For up years, mean return for each of the seven sectors is positive, indicating that, when the overall market (i.e., the composite index) generates positive returns, the sector indices move in the same direction. In contrast, as revealed in Table 2, mean return during down years is negative for only four of the seven sectors, so that not all sector indices move with the composite index during down years.

Also in Table 3, the results of significance tests for the difference in mean monthly return between up years and down years are presented. These tests reveal that, for three sectors (the telecommunications, computer and industrial indices), the difference between mean returns during up years is statistically significantly greater than mean returns during down years, at the 0.05 level of significance. Additionally, the other finance index generated statistically significantly greater returns during up years than during down years, at the 0.10 level of significance. Differences for the remaining three sectors (the transportation, bank and insurance indices) were not statistically significant, and differences for the transportation and bank indices were actually negative. Further, two of the three sectors with no statistically significant difference in mean return (i.e., the bank and insurance indices) play an important role in the next phase of this analysis, where correlations among the sectors are investigated. It appears that, during down years, correlations among some sectors are relatively high while other correlations between sectors are substantially lower.

Examination of Table 1 indicate the possibility that the bank, insurance and transportation sectors do not move along with the other four sector indices because standard deviations for these three sectors are substantially lower than the standard deviations for the remaining indices. When returns are separated by calendar year in Table 2, these three sector indices exhibit lower variability, compared to the other four sector indices. Further, the results in Table 3 reveal that these three sectors have positive returns over both sub-periods, up years and down years. Next, principal component analysis is performed over each market condition (i.e., up years and down years) to further detail this relationship.

The principal component analysis examines the extent to which the seven sector indices are integrated. Results are reported in Table 4. During the up-market phase, there is only one component, so that the seven sectors are integrated and highly positively correlated with each other. The implication for investors is that diversification benefits among the sectors may be relatively limited during the years of positive returns in this sample period. However, the more interesting outcome from this analysis derives from the examination of sector integration during

the years of negative returns. These results indicate that, during the down-market phase, sectors are substantially less integrated.

More specifically, the results in Table 4 indicate that, during the down-market phase, there were two components. The first component consisted of the following sectors: the telecommunications, computer, industrial, other finance and transportation indices. The second component consisted of the banking and insurance sectors. Therefore, these findings indicate that the banking and insurance sectors are clearly distinct from the other five sectors during the down-phase of market conditions, so that perhaps investors can derive diversification benefits by investing in the banking and insurance sectors during the down years.

Next, mean monthly returns are compared among the seven sectors in order to determine whether any particular sector generates significantly greater returns than others. In order to analyze these differences, pair-wise t-tests (as well as Wilcoxon signed ranks test) are utilized to identify specific differences among the seven sectors. Therefore, the mean monthly return for each sector is compared with those of the remaining six sectors in order to determine whether any pairs of sectors exhibit statistically significant differences, producing a total of twenty-one pair-wise comparisons among the seven sectors. These differences in sector returns are identified for three data groups from the sample period: (1) down years, (2) up years, and (3) the overall period. Therefore, a total of sixty-three comparisons are identified. Non-parametric Wilcoxon rank test statistics for significance in these comparisons were also performed. However, the results of these latter tests are not reported here as they are qualitatively similar to the results from the parametric t-tests, reported below.

The tests of significance indicate that, during down years, the telecommunications index has statistically significantly lower mean returns than the other six sectors. All other sector differences during down years were not statistically significant. For up-years, mean returns for the computer and telecommunications sectors were statistically significantly greater than the bank, insurance and transportation sector returns. Additionally, bank sector returns were statistically significantly less than returns for the other finance, industrial and insurance sectors. Furthermore, it is important to detect sector differences for the overall period because many investors regard their stock market investments as long-term, regardless of market conditions. For the overall sample period January 1998 through December 2007, the findings reveal that there were no specific statistically significant differences between sectors.

Finally, comparisons of mean returns for each sector index with mean returns for the composite index were performed over both short-term and long-term holding periods. During shorter time periods, some sectors exhibited mean returns statistically significantly different from mean returns for the composite. For example, during down years, composite mean returns are statistically significantly greater than telecommunications sector returns, and statistically significantly less than transportation sector returns. Additionally, during up years, composite returns are statistically significantly greater than bank, insurance and transportation index returns, and statistically significantly less than computer sector returns. More importantly, results indicate that none of the NASDAQ sector indices generated returns that are statistically significantly different from returns for the NASDAQ Composite index for the overall period 1998 through 2007.

V. Summary and Conclusion:

This study examines stock returns for NASDAQ sectors over the recent ten-year period January 1998 through December 2007. Specifically, this study is particularly focused on investigating whether any specific NASDAQ sector generated consistently greater returns than other sectors. The results revealed some specific differences in sector returns during shorter time periods. However, for individual long-term individual investors, the more critical issue is whether any sectors generate significantly greater (or lower) returns than do other sectors, or the composite index, over longer-time periods.

The results indicate that none of the NASDAQ sector indices outperformed (or under performed) other NASDAQ sector indices for the overall time period. Additionally, none of the NASDAQ sectors generated statistically significantly greater returns than did the NASDAQ Composite index over the long-run. These findings could be interpreted to indicate that long-term individual investors should not invest in any specific NASDAQ sector based on short-term market conditions.

Table 1

NASDAQ Sector Index Mean Monthly Percentage Returns
January 1998 to December 2007

Index	Mean	SD	CV	N
Insurance Index	0.77	4.20	5.45	120
Transportation Index	0.95	5.90	6.21	120
Other Finance Index	0.92	7.93	8.62	120
Computer Index	1.12	10.10	9.02	120
Industrial Index	0.78	7.69	9.86	120
Composite Index	*0.77*	*8.15*	*10.58*	*120*
Bank Index	0.29	4.03	13.90	120
Telecommunications Index	0.35	9.84	28.11	120

Note: SD is Standard Deviation, CV is Coefficient of Variation

Table 2

NASDAQ Sector Index Mean Monthly Percentage Returns
By Calendar Years

Index	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Insurance	0.21	0.62	1.41	0.63	-0.07	1.67	1.55	0.77	0.96	-0.02
Transportation	-0.34	0.25	1.38	1.23	0.34	2.65	2.11	0.87	0.60	0.39
Other Finance	0.59	3.18	-2.18	0.12	-1.48	4.73	1.64	1.03	1.41	0.15
Computer	5.70	6.71	-3.78	-0.93	-3.06	3.52	0.40	0.31	0.59	1.76
Industrial	0.96	4.84	-2.62	0.11	-2.18	3.86	1.33	0.11	1.04	0.39
Bank	-0.78	-0.62	1.30	0.85	0.42	2.25	0.91	-0.33	0.88	-2.01
Telecommunications	4.72	6.40	-5.53	-4.49	-5.47	4.54	0.75	-0.53	2.31	0.83
Composite	*3.22*	*5.59*	*-3.30*	*-1.13*	*-2.76*	*3.50*	*0.77*	*0.19*	*0.82*	*0.84*

Table 3

NASDAQ Index Monthly Returns By Market Conditions

	Up Years		Down Years			
Index	**Mean**	**N**	**Mean**	**N**	**T-Value**	***p-value***
Composite Index	*2.13*	*84*	*-2.40*	*36*	*2.87*	*0.005*
Telecommunications Index	2.72	84	-5.16	36	4.30	0.000
Computer Index	2.71	84	-2.59	36	2.70	0.008
Industrial Index	1.79	84	-1.56	36	2.23	0.028
Other Finance Index	1.82	84	-1.18	36	1.92	0.057
Transportation Index	0.93	84	0.98	36	-0.04	0.967
Bank Index	0.04	84	0.86	36	-1.02	0.311
Insurance Index	0.82	84	0.66	36	0.20	0.844

Note: Down Years are 2000 to 2002. Up Years are 1998, 1999, and 2003 through 2007. Mann-Whitney significance results were essentially similar to T-test results.

Table 4

Principal Component Analysis of NASDAQ Indices Over Market Conditions
January 1998 to December 2007

	Up Years	Down Years	
Index	**P.C. 1**	**P.C. 1**	**P.C. 2**
Telecommunications Index	**0.819**	**0.879**	-0.360
Computer Index	**0.742**	**0.913**	-0.308
Industrial Index	**0.929**	**0.938**	-0.239
Other Finance Index	**0.793**	**0.912**	0.136
Transportation Index	**0.787**	**0.695**	0.267
Bank Index	**0.792**	0.348	**0.846**
Insurance Index	**0.755**	0.244	**0.890**
Percentage of Variance	64.71%	56.91%	26.86%
Cumulative Percentage	64.71%	56.91%	83.77%

Table 5
Paired T-Test Comparisons of NASDAQ Sectors at 0.05 level Significance
Panel A: Down Years
Telecommunication < all other sector indices
Panel B: Up Years
Computer > Bank, Insurance, Transportation
Telecommunication > Bank, Insurance, Transportation
Bank < Other Finance, Industrial, Insurance
Panel C: Overall Period
None
Note: Wilcoxon Signed Ranks Test significance results were essentially similar to T-Test results.

Table 6
Paired T-Test Comparisons of NASDAQ Sector Index With Composite Index 0.05 level of Significance
Panel A: Down Years
Composite > Telecommunication
Composite < Transportation
Panel B: Up Years
Composite > Bank, Insurance, Transportation
Composite < Computer
Panel C: Overall Period
None
Note: Wilcoxon Signed Ranks Test significance results were essentially similar to T-test results.

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Managerial Decisions and the Weighted Average Cost of Capital

K. Matthew Wong

Abstract

This paper explores the relationship between the weighted average cost of capital (WACC) of a company and its marginal cost of capital. We adopt the classic economic theory of production to shed light into the conditions upon which WACC can be safely treated as the marginal cost of a company. Any violations of these conditions will lead a company to reach suboptimal capital budgeting decisions.

I. Introduction

This paper examines an important concept central to corporate finance — the weighted average cost of capital ("WACC"). Students and practitioners alike have long been told that to maximize a company's long-term market value, the company needs to maximize the number of positive net present value ("NPV") projects it undertakes. To calculate the NPV of a project, one would simply discount the expected future net cash inflows by the company's WACC. Alternatively, one should accept as many projects as possible so long as the project's internal rate of return (IRR) is greater than the company's WACC.

This IRR rule in capital budgeting, by equating the IRR of a project with the company's WACC, on the surface treats the WACC as the company's marginal cost of capital. As a result, it is easy to mistakenly believe that the WACC is the same as the marginal cost of capital of the company. In fact, a critical assumption of this "capital budgeting rule" is that the company has maintained the target capital structure whereby at that optimal level of debt, the WACC is minimized. However, the road to this WACC minimization is rarely discussed in detail. This paper adopts the classic economic theory of production to shed light into the conditions upon which WACC can be safely treated as the marginal cost. Any violations of these conditions will lead the company to reach suboptimal capital budgeting decisions.

This paper is organized as follows: in the next section, we discuss Modigliani and Miller's (MM) Proposition III since MM provide the fundamental treaties on the estimation of a company's WACC. Section 3 examines the typical textbook treatment of WACC and its relationship with MM's definition. The pedagogical issues are discussed in Section 4. Section 5 concludes the paper.

III. Modigliani and Miller's WACC

In their seminal paper (Modigliani and Miller 1958), under several restrictive assumptions, MM show that the net worth of current shareholders will increase if the expected rate of return on investment is greater than the firm's cost of capital (Proposition III). MM define the firm's cost of capital as:

$$WACC = K^{U}_{s} (1 - t \Delta B / \Delta I); \quad (1)$$

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where K^U_s is the cost of equity for the unlevered firm; t is the tax rate; ΔB is the change in debt and ΔI is the new investment. In a later paper (Modigliani and Miller 1963), MM argue that at least as a first approximation, $\Delta B / \Delta I = B^* / (B^* + S^*)$ where $B^* / (B^* + S^*)$ denotes the long-run "target" debt ratio which is constant. However, there were no formal derivations of what the "target" debt ratio should be.

III. Textbook WACC

The usual expression of WACC in textbooks (see, e.g. Brigham and Ehrhardt 2005, and Ross, Westerfield and Jordan 2006), assuming that the firm does not issue preferred stocks, is as follows:

$$WACC = K_d (1 - t) \times B/(B + S) + K_s \times S/(B + S); \quad (2)$$

where WACC is the company's overall financing cost, K_d is the company's before tax cost of debt, t is the marginal tax rate; K_s is the cost of equity; B is the market value of debt and S is the market value of equity.

This textbook WACC can be shown as identical to MM's definition of WACC by substituting MM's Proposition II into eq. (2) above and assuming that $B / S = \Delta B / \Delta S$ (see Copeland, Weston and Shastri 2005, p. 570 for proof.) [3]

IV. Managerial Issues

Most available textbooks often ignore the fact that the WACC is the average cost of capital, not the marginal cost of capital. However, when a company applies its WACC to discount future cash flows and to decide whether to accept or reject a particular project, the company is treating the WACC as the marginal cost. Basic economic theories show that to maximize a company's value, a company should continue undertaking additional projects until the point where the marginal revenue of an additional project is equal to the marginal cost of the project. (See, e.g., Baumol and Blinder 2000, p. 176). Broadly speaking, if we consider the continuous function and the new project being infinitely small, this condition is the same as investing until the point where the internal rate of return of the new unit (however the unit is defined) equals the capital cost (in percentage) of investing in the new unit. In corporate finance, we can then speak of investing until the point where the marginal return (MR) on the next project equal the marginal cost of the next project, MR = MC; or MR = WACC if we assume that the risk of the new project is similar to that of the company's average project and the company's WACC equals its MC.

In fact, we are using an average cost as if it were a marginal cost. But economic principles indicate that such an application of average cost will not maximize overall company value. So why are we using it this way? It should be noted that following MM's argument, if B/(B + S) is treated as the long run target debt to value ratio (which is constant), then the WACC

[3] MM's Proposition II states that $K^L_s = K^U_s + (K^U_s - K_d)(1 - t)(\Delta B / \Delta S)$, where K^L_s is the cost of equity of a levered firm. Note that eq. (1) can be alternatively expressed as $WACC = K^U_s (1 - t\, B / B + S)$ following MM's assumption of having the long-run "target" debt ratio.

will be constant since both K_d and K_s are constant in the MM world with perfect competition and identical risk class. As long as the WACC is constant, it is identical to the firm's marginal cost. But this nuance is often ignored. In any case, the insertion of the long term target debt to value ratio argument merely solves the issue of treating the WACC as a marginal cost *mathematically*; there is very little economic rationale behind the argument. This paper shows an alternative demonstration that the WACC can in fact be the marginal cost under certain conditions.

Microeconomic principles suggest that in the long run, all costs are variable. At the point where the long-run average total cost of production is minimized, the company's short-run average total cost of production is identical to the long-run average total cost of production; so is its marginal cost of production. That is, at that particular long-run level of output:

LRATC=SRATC=MC;

where LRATC is the long run average total cost; SRATC is the short run average total cost; and MC is the marginal cost. This argument is discussed in all microeconomic books and should be familiar to students. Figure 1 illustrates the condition. In the short run, the company targets it production level at a certain range and therefore, the minimum cost output level is where SRATC = MC. However, in the long run, the company is faced with many choices of output levels, the SRATC will shift and one can trace the LRATC that "envelopes" the SRATCs at different output levels.[4]

A. The Short-Run Solution

The company's capital costs and investments can be viewed in the same light. Many researchers portray the WACC of the company as a step function as shown in Figure 2A. When the dollar amount of new investments is low and the need for new capital is low, the WACC is low. As the dollar amount of new investments increases, the WACC will inevitably move up in steps. The reasons why the WACC rises in steps rather than continuously is that the financial market is not frictionless. For example, within certain reasonable range of debt level, the perceived risk level of the company will likely remain the same. As a result, K_d and K_s will be relatively constant at that range. By superimposing the investment opportunity schedule (IOS)[5] onto the WACC schedule, one can determine the optimal level of investments in the short-run. As long as the company's WACC is the same as its MCC, the solution is correct and the level of investments will maximize the company's value.

Obviously, the WACC schedule in Figure 2A ignores the flotation costs.[6] In fact, the calculation of WACC as expressed in eq. (2) underestimates the true WACC by focusing only on K_d and K_s before flotation costs. If K_d and K_s are adjusted for flotation costs, then this adjusted WACC curve is similar to the usual short-run average total cost (per unit of production) curve found in most economic textbooks. (See McConnell and Brue, 2002, Chapter 22.) Now we can

[4] The LRATC curve is the points of tangency of all SRATCs.
[5] IOS is a graph ranking the IRRs of each prospective project.
[6] If the WACC curve is indeed the MCC curve, then flotation costs should not matter in the short-run since flotation costs can be considered fixed costs within a certain level of capital raised. MC is related only to variable costs, not to fixed costs.

envision the adjusted WACC curve (or the average total cost per unit of capital) to slope downward when the total capital requirement for new projects are low since in the short-run,[7] companies tend to rely on debt for incremental capital because debt is relatively cheaper than equity and issuing equity dilutes equity ownership. But sooner or later, as more debt is raised, the adjusted WACC will move upward, as depicted in Figure 2B.

Even if the flotation costs remain constant, beyond a certain point, the WACC will increase as the debt to equity ratio (B/S) increases due to the increased level of financial risk. Note that the short-run marginal cost of capital (SRMCC) curve (i.e. the cost of debt in this case) intersects the WACC curve at its minimum point. This intersection point also identifies the optimal debt to value ratio in the short-run. However, implicit in Figure 2B is the condition that the company has found the optimal capital structure where the weighted average cost of capital equals the marginal cost of capital before the company can undertake projects up to the point where it short-run marginal return of capital equal its short-run marginal cost of capital.

B. The Long Run Solution

In the long-run, all resources/inputs are variable. Thus, the company may increase its equity capital to offset the increased level of debt as it strives to maintain the optimal (short run) debt to value ratio. Here, the long-run solution is far more complex.

Empirical research shows that other costs of issuing debt and equity (flotation costs) likely follow a step function. Because of economies of scale and bargaining power, flotation costs as a percentage will likely be lower in larger deals. Lee, Lockhead, Ritter and Zhao (1996) document that depending on the size of the deal, the total costs for an equity IPO range from 5.15% (> $500 mil.) to 15.36% ($2 mil. to $10 mil.); for secondary offerings, the costs are 3.64% (> $500 mil) to 12.88% ($2 mil. to $10 mil.); and for straight bonds, they range from 0.82% (> $500 mil) to 3.74% ($2 mil. to $10 mil.)[8] It is evident that the less complicated and the larger the deal, the lower its direct costs.

Now even if K_d and K_s are roughly constant within a certain range of capital raised, once we take into account of the lower percentage flotation costs in successive increments, the WACC curve will shift down as the amount of capital raised increases. Beyond a certain point though, the WACC curve will begin to shift upward. The reason is that when a company needs to raise successively more capital, its cost of capital (K_d and K_s) will eventually go up since the company must increase the investment return to entice ever more investors. In addition, the decline in flotation costs most likely cannot completely offset the increase in costs of debt and equity since these costs of capital account for the majority of the costs of funding.

Figure 3A illustrates the situation faced by the company in the long run. Suppose the company starts from short-run period 1, its optimal debt to value ratio is depicted as point A, the point of intersection between the company's short-run WACC ($SRWACC_1$) and its short-run marginal cost of capital curve ($SRMCC_1$). Point A also depicts the level of capital raised that minimizes the company's WACC. As the company changes its capital structure and the amount

[7] Short-run denotes the period when at least one of the resources is fixed.
[8] These figures were updated by Ross, Westerfield and Jordan (2006), p. 517, for the period 1990-2003.

of capital raised during the course of business in the long-run, the WACC curve and the MCC curve will shift from period 1 to period 2 and then to period 3. The WACC curve for the company in the long-run (LRWACC) is the points of tangency of the short-run WACC curves.

Following the logic espoused at the beginning of this section, in the long run when the company reaches the optimal debt to value ratio at point B, its LRWACC equals its $SRWACC_2$ and its marginal cost of capital. That is,

$$LRWACC = SRWACC_2 = SRMCC_2$$

However, before the company reaches this optimal debt to value ratio and optimal amount of capital raised in the long run (point B), the company's WACC is not equal to its marginal cost of capital. For instance, at point A the company's WACC (LRWACC) is lower than its MCC ($SRMCC_1$). Only at point B will the company's WACC equals its MCC.[9] For many companies, their practice of selecting projects by setting the project's expected marginal return against the company's WACC will lead to suboptimal results for investors.

To further clarify this point, we have a company with no capital and wants to raise $50 mil.. Assume also that the market is very liquid such that the component costs of capital remain fairly constant up to $2 bil. The tax rate is 40%. The following table shows the costs of component capital and the associated WACC.

	20% Debt	30% Debt	40% Debt
Cost of Equity	7.5%	7.7%	9.5%
Cost of Debt	10%	10.5%	12%
WACC	8.9%	8.82%	9.48%

Here, at the optimal capital structure of 30% debt, the company's WACC is 8.82%. Having successfully raised $50 mil., now the company wants to raise another $10 mil entirely in debt. Now, the marginal cost of capital for the company is 5.7% which is different from the company's WACC.[10] In the long run, the company may want to raise, say, $500 mil. Assume that the advantage of lower flotation costs alone lowers all component cost of capital by 0.2%. For example, at 20% debt level, the cost of equity is now at 7.3% and the cost of debt is at 9.8%. The associated WACCs than become 8.72% (20% debt), 8.56% (30% debt), and 9.31% (40% debt). Clearly, the company's WACC curve with different capital structures in the long run with $500 mil. of capital is lower than that in the short run in this example, similar to the conclusion drawn in Figure 3A.

C. Capital Budgeting Decision in the Long-Run

One key difference between our analysis in the short-run and the long-run is that in the long run when the company has many choices of different levels of capital raised (both debt and

[9] As an aside, in a world with no barriers to entry, at the long run optimal level of debt to value ratio (capital structure) and optimal level of capital raised, MR=WACC=MCC since there should be zero economic profit (which includes capital costs) at this point.

[10] With an additional $10 mil. in debt, the D/V ratio = $25/$60. Hence, the MC of new capital is 9.5%(1 - 40%) = 5.7%.

equity), the company's WACC will equal its MCC only if the company reaches the point where both the debt to value ratio and the level of capital raised are optimal.
Evidently, the solution presented in Figure 2A previously is only a suboptimal short-run solution even if one assumes that the company's WACC equals it MCC. The correct solution is depicted in Figure 3A if the market is frictionless. A difficulty in making capital budgeting decision in the long-run as expressed in Figure 3A is that the overall project investments, assuming each project's risk is the same as that of the overall company, must equal the optimal level of capital raised. In fact, the company needs to determine the optimal level of capital raised before it considers the projects since the point where WACC equals MCC is jointly determined by the amount of capital raised and the debt to value ratio.

In practice, however, the optimal point, point B, in Figure 3A likely is a range as depicted by the region A to B in Figure 3B rather than a point because financial market is not frictionless.[11] Figure 3B shows that economies of scale in flotation costs and other financial costs materialize quickly before point A and diseconomies of scale do not set in until point B. Therefore, the long-run WACC is constant over a wide range of possible levels of capital raised and debt to value ratios. Between points A and B, the company's WACC equals its MCC. If the company ranks its possible projects by their respective IRRs and constructs the investment opportunity schedule (IOS), then all projects up to the point I_1 (a certain combination of capital raised and debt to value ratio) should be accepted. If a different combination of capital raised and debt to value ratio is desired, then all projects up to I_2 should be accepted. However, point I_3 is not optimal because at point I_3, the company's WACC does not equal its MCC.

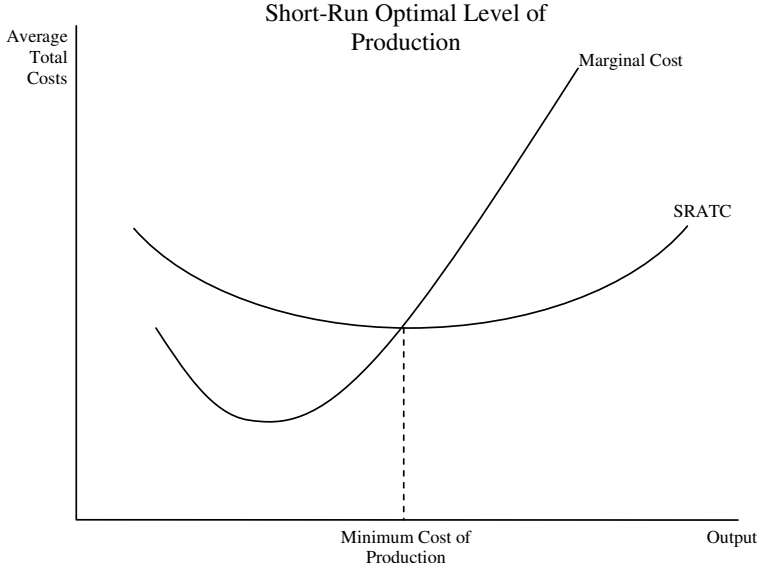
V. Conclusion

This paper analyzes the relationship between the company's weighted average cost of capital and its marginal cost of capital. We show that only under certain conditions can the company's WACC equals its MCC. Microeconomic principles are used to shed insights into the well known capital budgeting rule of investing until the point where the new project's IRR equals the company's WACC. Critical to this rule is the assumption of optimal debt to value ratio (i.e. optimal capital structure). However, this paper demonstrates that even with this assumption, this common capital budgeting rule is just a suboptimal short-run solution since it does not take into account the quantity of capital being raised.

In the long-run, to minimize its WACC the company must jointly determine the optimal debt to value ratio and the optimal level of capital. Assuming that new projects have the same risk as the company's existing projects, the company can then use its WACC as the investment cutoff rate since its WACC now equals its MCC. Any violations of these conditions will lead to suboptimal investment decisions in the long-run. In practice, however, the company will probably face a range of feasible debt to value ratios and desired levels of capital due to imperfect market conditions. As a result, the long-run solution is not as restrictive as it may first appear. Our analysis of the WACC here allows practitioners to better understand the economic rationales behind the pure mathematical arguments found in the literature.

[11] For example, flotation costs as a percentage typically do not fall continuously but in steps.

Figure 1
Short-Run Optimal Level of Production



Long-Run Optimal Level of Production

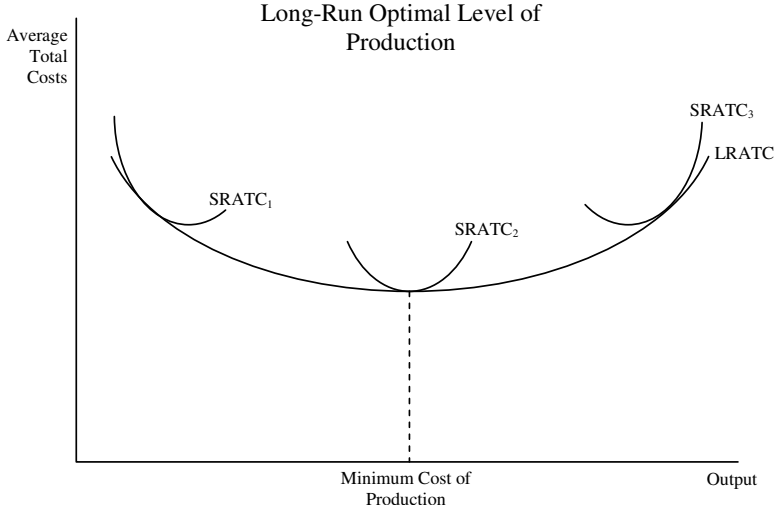
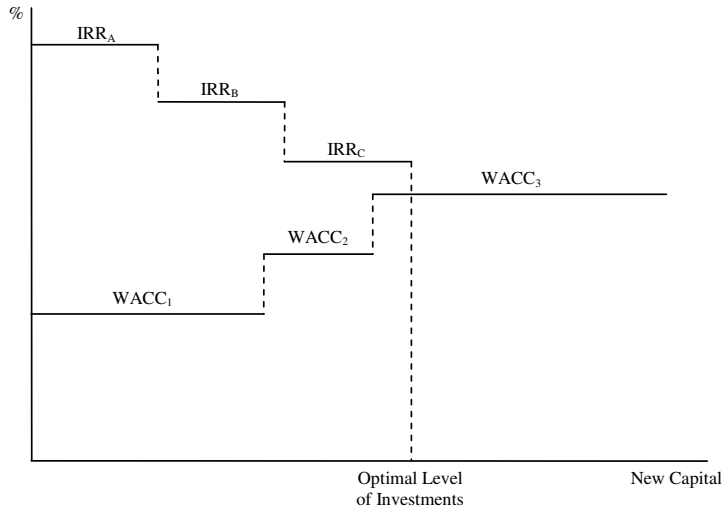


Figure 2A
Short-Run Marginal Cost of Capital Schedules



Note: By superimposing the investment opportunity schedule onto this figure, the company can determine the optimal level of investments in the short-run.

Figure 2B
Short-Run Optimal Capital Structure

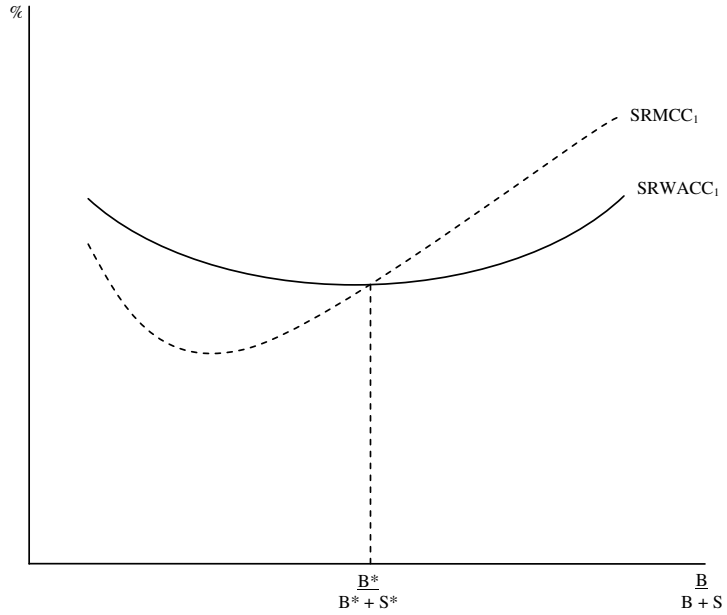


Figure 3A
Short-Run and Long-Run Optimal Level of Debt to Value Ratio and Investments

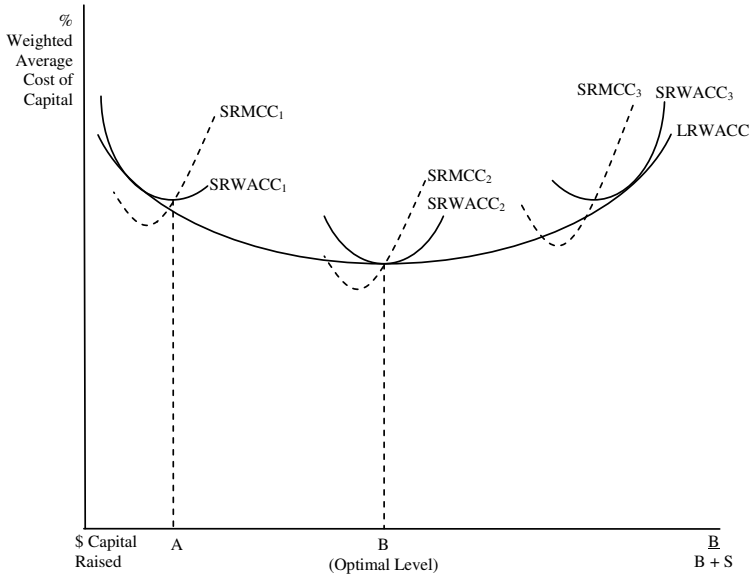
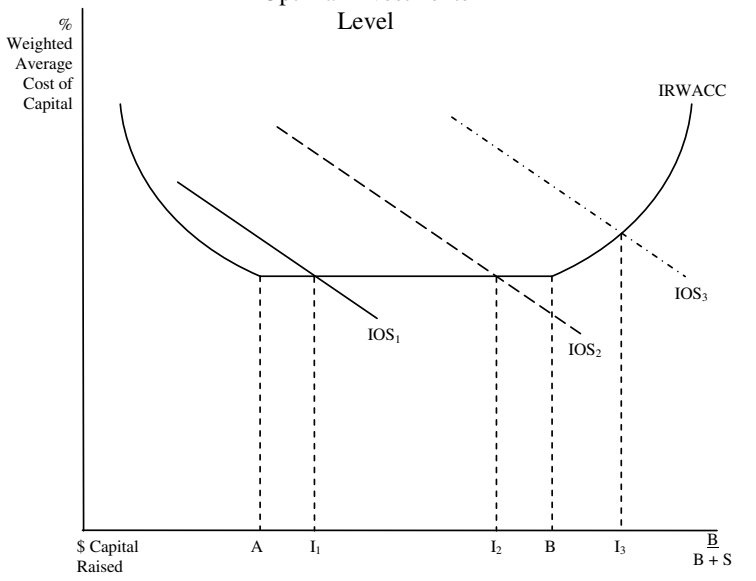


Figure 3B
Optimal Investments Level



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Financing of Entrepreneurial Ventures

Kashi Nath Tiwari

Abstract

Entrepreneurs with zero startup capital can launch new ventures through kind-financing from input-suppliers by offering higher input-prices at time t+k; and, through kind-offering at lower prices at time t+k to output-buyers who make advance payments at time t. Interests of entrepreneurs, input-suppliers, and output-buyers get intertwined through such arrangements. All parties (entrepreneurs, input-suppliers and output-buyers) joined through kind-financing, kind-offering, and advance-payments have vested interests in the success of the new-venture (and they contribute through their expertise). This improves efficiency thereby generating a higher level of output than the one generated under cash-financing and spot-selling. The value of outputs generated through kind-financing will be greater than the value of outputs owed to kind-suppliers; and, the quantity of outputs generated through advance-payments will be greater than the quantity of outputs owed to advance payers. All types of ventures (new-ventures, growing-ventures, and advanced-ventures) gain through kind-financing and forward-selling.

I. Types of Contingency Deals in the Real Sector

Through kind-financing and through forward-selling, the entrepreneurs can optimize their objective functions. Kind-financing appears to be universally superior to cash-financing for introduction, maintenance, and growth of all types of ventures (new-ventures, growing-ventures, and advanced-ventures). Under kind-financing, principals, agents, and employees have common interest in promoting the growth of their joint-ventures. The benefits of improved efficiency and stability with kind-financing outweigh the tax-benefits of cash-financing for both input-suppliers and input-buyers. Through kind-financing, entrepreneurs decrease the leverage ratio which, in turn, increases the confidence level of the public and the regulatory agencies in the new-ventures. If the weighted average of the expansion-rate and contraction-rate equals the expected rate of return during each time period, then net-venture values at each point in time would be identically zero. However, if the former exceeds the latter at any point in time, then the net venture-value will be viably positive. Positivity of the venture-value at time-h (rather than time-0) should be the venture adoptability criterion.

Markets for various goods and services appear to be segmented; and, market participants prefer to reside in their chosen habitats without making comparisons with other habitats. When markets are compartmentalized, the risk-reward tradeoff hypothesis is severely compromised. Due to efficiency gains, returns per unit of risk for entrepreneurs, kind-financiers, and output-buyers are greater under kind-financing and forward-selling than those under cash-financing and spot-selling. Some entrepreneurs may strictly prefer cash-financing while others may strictly prefer kind-financing irrespective of the level of cost differentials between cash-financing and kind-financing. Uncertainty, perception, and subjective measurements initiate market participants in selecting their habitat (preferred-habitat). As such, one cannot label market participants as rational or irrational. Rationality or irrationality in behavioral sciences is a

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subjective relative term. Buyers and sellers (without being labeled as rational or irrational) can execute trades in various ways to optimize their objective functions:

1. Price-paid at time t (spot market at time t) and the commodity-received at time-t (spot market at time t).

2. Price-paid at time t+k (spot market at time t+k) and the commodity-received at time t+k (spot spot market at time t+k).

3. Price-paid at time t+k (future) and commodity-received at time t+k (future) with the price, quantity, and quality set at time t (spot). Forwards, futures, and options [pertaining to the purchase and sale of the underlying item at a later date] are examples of such transactions. The gasoline-users that had traded such contracts did better during the price-hikes of 2008.

4. Price-paid at time t (spot) and the commodity-received at time t+k (future) with the quantity and quality of the commodity set at time t (spot). Advance ticket-buyers (concert, travel, or special events) pay the price at time-t and receive the services at time t+k.

5. Price-paid at time t+k (future) and commodity-delivered at time t (spot) with the price set at time t (spot). For example, workers (with stocks and stock options as part of the compensation package) deliver at least a part of their work-time at time t (spot) and receive the compensation at time t+k (future). Such contingency deals are more prevalent in employee-owned corporations than in the traditional corporations (private or public).

II. Market Segmentation and the Breakdown of Risk-Reward Trade-Off

The conventional theories of risk-reward trade-off, equalization of rewards per unit of risk across all transactions, and market efficiency become insignificant in the presence of compartmentalized markets. Segmented markets (coupled with government interventions that block the process of adjustments) exist for every transaction category: spots and forwards, long-term deals and short-term deals, risk-preference and risk-aversion, and others. Contingency based contracts reduce the level of risks by improving the level of efficiency; and they deliver higher rewards to input-suppliers and input-buyers (such that the rewards per unit of risk under contingency transactions are greater than the same under spot transactions). Contingency markets and spot markets may be segmented such that some economic units may prefer the latter over the former; and as such the contingent-transactions may continue to deliver higher returns to input-sellers and input-buyers. For new-ventures, uncertainty, agency costs, and fierce competition from advanced-ventures lower the probability of receiving seed-money from cash-granting firms. Kind-financing can be viewed as synthetic stock-financing, while cash-financing can be viewed bond-financing. New-ventures are aggressively relying on contingency-deals from input-providers with surpluses. Such deals reduce costs, increase revenue, and manage risks for new-ventures and input-providers with surpluses. Even in the absence of surpluses, input-providers are finding it profitable to become surrogate partners through kind-financing. While enhancing employee-loyalties, such contracts eliminate operational-risks and agency-problems. Decrease in the leverage ratio decreases the tax-benefits for the firm while increasing the same for the government and the public. Contingent kind-financing invites accelerated levels of guidance, scrutiny, and supervision from input-suppliers. The initial net venture value at time-0 could be

negative, yet the net venture values during the subsequent time periods could be positive. The decision criterion should be based upon the net venture value at the optimal holding time period rather than the initial time period.

Contingent kind-financing is superior to cash-financing in that the former intensifies the bondage between output-suppliers and input-suppliers. New-ventures and expanding-ventures could have cash-financing, kind-financing, or mix-financing. Stock-payments and stock-options (that tie up the interests of principals, agents, and employees) have experienced accelerated growth. Under contingent kind-financing, an entrepreneur pays higher input-prices (albeit at a later date when the venture succeeds) than the cash-financing; yet the overall cost is much lower and overall revenue is much higher. This is due to the fact that interest payment is virtually zero; and, the input-costs plus the interest payments under cash-financing far exceed the input-costs under contingency-operations. Moreover, the input-suppliers would help the entrepreneur produce better quality, expand the consumer base, and charge an acceptable set of higher prices. Contingency-financing is easily convertible to cash-financing, as the input-shares could be bought out at any time; however, cash financing cannot be easily converted into kind-financing since creditors are rarely input-suppliers. Cash-financing is a leverage-increasing strategy, while contingency-financing is a leverage-reducing conservative strategy. Contingency counterparties are essentially business partners. Entrepreneurs appear to focus solely on cash-financing overlooking a desirable alternative - the kind-financing; this paper demonstrates that the kind-financing is easier, quicker, and superior. The strategic decisions (venture-acceptance or venture-rejection) should not be based on the net venture-values estimated at time-0.

There are two ways to meet the capital requirements for an entrepreneur: conventional method of outright borrowing and dynamic method of striking contingency deals with various factors of production. The former is borrowed-cash-financing and the latter is contingency-kind-financing. A new entrepreneur (founder of a new-venture) may attempt to raise seed-capital and sustaining-capital from various sources: friends, families, banks, nonbank financial institutions, venture-capitalists, angel-capitalists, risk-preferring individual investors, government agencies (federal, state, and local), and world-agencies (world-bank, IMF, and other agencies of the U.N.O.). A quality business plan (and quality presentation) is a pre-requisites for raising the desired capital. With an outstanding business-plan, an entrepreneur can strike contingency-deals with input-suppliers [land-lord, regular-labor, skilled-labor, lawyers, accountants, raw-material suppliers, utility-suppliers, insurance companies, pension funds, tax-authorities]. Input suppliers would be rewarded at a much accelerated rate contingent upon the success of the new-venture. There are numerous input-suppliers that may have excess inventories (of goods, services, and time); and they may be willing to strike contingency-deals (with the entrepreneurs) in an expectation of higher potential rewards in the future (their excess inventories are virtually worth "nothing" in the marketplace at the present time anyway). The entrepreneurs will be utilizing kind-financiers' goods and services without making any payments upfront. If k is the vested time-period, and if the expectations of the entrepreneurs are realized, then all of the input-owners will receive payments in excess of their respective market rates.

The conventional models focus on cash-financing, while this paper introduces kind-financing. Kind-financing and kind-trades [swapping bonds for bonds, stocks for stocks, bonds for stocks, and other hybrid trades] are not a rarity in the financial sector. In fact, the financial swap volume has grown from $865 billion in 1987 to over $500 trillion in 2008. The authors

covering various aspects of financial-swaps [Flavell, 2002; Hull, 2009; Walker, 2003] primarily emphasize the risk-management aspect of such trades. Paradoxically, such coverage is lacking in the venture-financing literature [Adelman, 2008; Camp, 2008; Conneighton, 2003; CRMPG-III, 2008; EPA, 2008; Gladstone, 2008; Gompers 2002; Hoagland 2002; Leach, 2008; NSF, 2002; Smith 2008; Stancill 2008; Timmons, 2007; US-SBA-SBIR, 2008]. This paper attempts to fill this void.

III. Cash-Financing and Kind-Financing

In the housing sector, interest-costs are zero for house-buyers who pay the full amount in cash. The interest costs for individuals who make larger amount of down payments are lower than the same for those who make lower amounts of down payments. Individuals making higher down payments (or full payments) are no better off than the individuals making lower down payments. Individuals making lower down payments receive tax-deductibility benefits and use their savings wisely for investments in other sectors. In fact the former group may be better off than the latter group if all other factors are taken into account. Of course, if markets are efficient (which at times may not be possible under distortions created by interventions), then the combination of earning-rate and cost-rate for both sets of individuals would be identical. Some travelers choose to pay in advance by purchasing tickets prior to the travel-date, while others choose to purchase the tickets on the travel-date. Generally, the spot ticket-price is greater than the price paid in advance. Adjusting for the time-value of money and all other factors that influence the decision making process (as to why some individuals pay in advance, while others choose to pay on the spot) and assuming market efficiency (which at times may not be possible under distortions created by interventions), the satisfactions derived by both groups of individuals would be the identical. The same risk-reward principle applies with respect to all sectors, including the input sector – the sector in focus herein. The opportunity-cost of the input-supply could be zero or positive depending upon the supply and demand conditions at a particular point in time. If the inputs are in excess supply, then they have zero opportunity costs (the inputs are not in demand and hence their market value is zero). If the inputs are in shortage, then a positive opportunity-cost does exist. Accountants, lawyers, and other service-providers that have plenty of free time would be willing to provide kind-financing at a lower contingency-fee, while others with no free time would be willing to provide kind-financing at a higher contingency-fee.

Cost-Side: Case-1 (cash-financing):

An entrepreneur borrows funds and pays out market rates to input suppliers; the total cost (Z_t) at time t is:

$$Z_t = \beta_t\Omega_t + z_{1t}M_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tf}$$

z_{jt} = market price of input M_{jt} at time t (j=1,2,3,...,n) under cash-financing

M_{jt} = quantity of input M utilized at time t (j=1,2,3,...,n) under cash-financing

Ω_t = amount of funds borrowed at time t under cash-financing

β_t = capital cost rate under cash-financing

γ_{tf} = cost-reduction due to economies of scale and positive spillover effects under cash-financing operations

Cost-Side: Case-2 (kind-financing):

An entrepreneur signs contingency contracts with input-suppliers; the contingency-based total cost (S) at time t is:

$S_t = \beta_t \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}$

s_{jt} = market price of input M_{jt} at time t (j=1,2,3,...,n) under kind-financing

M_{jt} = quantity of input M_j utilized at time t (j=1,2,3,...,n) kind-financing

θ_t = funds borrowed under contingency operation

β_t = capital cost rate under kind-financing (same as cash-financing)

γ_{tc} = cost-reduction due to efficiency gain through multiparty cooperation among employees, input-suppliers, principals, and agents (along with the traditional economies of scale and net positive spillover effects) under kind-financing operations

Input-suppliers in the spot market assume zero risks, since the price for the inputs supplied is received on the spot instantaneously. However, input-suppliers through the contingency markets assume considerable risks (input prices will be paid much later and that too only if the venture meets its target). Since contingent input-suppliers are taking additional risks (they will receive full-payments only if the venture is able to attain its targets), the contingent input-prices will be higher than the spot input-prices. The cost relationship between financing-models and contingency-models can be described as

$[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt}] > [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt}]$

$s_{1t} > z_{1t}$, $s_{2t} > z_{2t}$, $s_{3t} > z_{3t}$, ..., $s_{nt} > z_{nt}$, due to the fact that

$z_{it} = s_{it} - E(L_{sit})$

$E(L_{sit})$ represents expected loss on risky contingency-contracts. When markets are efficient, the contingent input-price per-unit of risk would be identical to the spot-price per unit of risk (which approaches zero). Let

σ_{sit} = riskiness of contingency-deals measured by the standard deviation of contingent input price variations.

$\sigma_{zit} \rightarrow 0$ is the riskiness of spot-deals measured by the standard deviation of spot input price variations.

$[s_{it}/\sigma_{sit}]$ = input-price per unit of risk under contingency-contracts

$[z_{it}/\sigma_{zit}] = z_{it}\ (\sigma_{zit} \rightarrow 0)$ = input-price per unit of risk under spot-transactions

$[s_{it}/\sigma_{sit}] = [z_{it}/\sigma_{zit}]$

For the existence of risky contingency-contracts, the expected contingency-based input-price (s_{it}) must be greater than the generic borrowing-based input-price. However, the efficiency-gains under contingency-transactions (γ_{tc}) is greater than the same under spot-transactions (γ_{tf}):

$\gamma_{tc} > \gamma_{tf}$

since $\gamma_{tf} \rightarrow 0$ and,

$\Omega_t > \theta_t, \quad \beta_t\Omega_t > \beta_t\theta_t, \ \beta_t(\Omega_t - \theta_t) > 0,$

since $\theta_t \rightarrow 0$ (entrepreneurs heavily rely on kind-financing)

Furthermore,

$$[\beta_t\theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} + ... + s_{nt}M_{nt} - \gamma_{tc}]$$

$$< [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} + ... + z_{nt}M_{nt} - \gamma_{tc}]$$

due to the fact that

$$\beta_t(\Omega_t - \theta_t) + (\gamma_{tc} - \gamma_{tf})$$

$$> \{[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} + ... + s_{nt}M_{nt}] - [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} + ... + z_{nt}M_{nt}]\}$$

Thus the cost level under kind-financing is less than the same under cash-financing. The entrepreneurs will be indifferent between financing-deals and contingency-deals if

$$\beta_t(\Omega_t - \theta_t) + (\gamma_{tc} - \gamma_{tf})$$

$$= \{[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} + ... + s_{nt}M_{nt}] - [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} + ... + z_{nt}M_{nt}]\}$$

The entrepreneurs will prefer financing-deals to contingency-deals if

$$\beta_t(\Omega_t - \theta_t) + (\gamma_{tc} - \gamma_{tf})$$

$$< \{[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} + ... + s_{nt}M_{nt}] - [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} + ... + z_{nt}M_{nt}]\}$$

The entrepreneurs will prefer contingency-deals to financing-deals if

$\beta_t (\Omega_t - \theta_t) + (\gamma_{tc} - \gamma_{tf})$

$> \{[s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt}] - [z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt}]\}$

IV. Revenues at Time t+k and payments to kind-suppliers and kind-buyers

On the production-side, the entrepreneurs will be helped by their contingency-partners (input-sellers) in producing better quality (δ), selling larger quantities (Φ), and obtaining higher prices (λ), obtaining economies of scale, and deriving externality benefits. The input-sellers have vested interest in the new venture to make it survive and prosper.

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}] > [\lambda_{tf}\ \delta_{tf}\ \Phi_{tf}]$

$\lambda_{tc}\ \delta_{tc}\ \Phi_{tc} = [\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{ks} + [\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{kb} + [\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{e}$

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{ks}$ = kind-suppliers' share of revenue under kind-financing and forward-selling

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{ks}$ = kind-buyers' share of revenue under kind-financing and forward-selling

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{e}$ = entrepreneur's share of revenue under kind-financing and forward-selling

$[\lambda_{tf}\ \delta_{tf}\ \Phi_{tf}]_{fs}$ = cash-suppliers' share of revenue under cash-financing and spot-selling

$[\lambda_{tf}\ \delta_{tf}\ \Phi_{tf}]_{e}$ = entrepreneur's share of revenue under cash-financing and spot-selling

Entrepreneur's share of revenue under kind-financing and forward-selling will be greater than that under cash-financing and spot-selling:

$[\lambda_{tc}\ \delta_{tc}\ \Phi_{tc}]_{e} > [\lambda_{tf}\ \delta_{tf}\ \Phi_{tf}]_{e}$

λ_{tc} = product-price under contingency kind-financing

δ_{tc} = product-quality under contingency kind-financing

Φ_{tc} = product-quantity under contingency kind-financing

λ_{tf} = product-price under cash-financing

δ_{tf} = product-quality under cash-financing

Φ_{tf} = product-quantity under cash-financing

V. Profit-Optimization

Profit-functions under cash-financing (Π^f) and contingency-kind-financing (Π^c) can be defined as:

$$\Pi^c = [\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$$

$$\Pi^f = [\lambda_{tf}\, \delta_{tf}\, \Phi_{tf}] - [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tf}]$$

The optimization of the objective function (U) involves two steps. First, an entrepreneur chooses the optimal financing path (cash-financing or contingency-kind-financing):

$$U = \max(\Pi^f, \Pi^c)$$

Contingency-kind-financing path would be chosen if

$$[\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$$

$$> [\lambda_{tf}\, \delta_{tf}\, \Phi_{tf}] - [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tc}]$$

Borrowed-cash-based business operation would occur if

$$[\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$$

$$< [\lambda_{tf}\, \delta_{tf}\, \Phi_{tf}] - [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tc}]$$

The point of indifference occurs when

$$[\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$$

$$= [\lambda_{tf}\, \delta_{tf}\, \Phi_{tf}] - [\beta_t\Omega_t + z_{1t}Mt_{1t} + z_{2t}M_{2t} + z_{3t}M_{3t} +...+ z_{nt}M_{nt} - \gamma_{tc}]$$

Second, the entrepreneur optimizes the profit function associated with the selected business operation path. The empirical observations unequivocally indicate that a contingent kind-financing would be unambiguously superior to a cash-financing. Employee-owned corporations with kind-financing are proving to be superior to privately or publicly-owned corporations with cash-financing. Family-owned small motels and ethnic-restaurants (in the heart of the cities and along the highways) with largely kind-financing have proven to have a much higher survival rate and growth rate. The necessary conditions for profit maximization emanating through the contingency-based business-operation path ($\Pi^c = [\lambda_{tc}\, \delta_{tc}\, \Phi_{tc}] - [\beta_t\, \theta_t + s_{1t}M_{1t} + s_{2t}M_{2t} + s_{3t}M_{3t} +...+ s_{nt}M_{nt} - \gamma_{tc}]$) are given by:

$$\partial\Pi^c/\partial\Phi_{tc} = 0,\ \partial\Pi^c/\partial\delta_{tc} = 0,\ \partial\Pi^c/\partial M_{1t} = 0,\ \partial\Pi^c/\partial M_{2t} = 0,\ \partial\Pi^c/\partial M_{3t} = 0, ..., \partial\Pi^c/\partial M_{nt} = 0$$

and the sufficient conditions are:

$\partial^2\Pi^c/\partial\Phi^2_{tc} < 0,\ \partial^2\Pi^c/\partial\delta^2_{tc} < 0,\ \partial^2\Pi^c/\partial M^2_{1t} > 0,\ \partial^2\Pi^c/\partial M^2_{2t} > 0,$

$\partial^2\Pi^c/\partial M^2_{3t} > 0, ..., \partial^2\Pi^c/\partial M^2_{nt} > 0$

VI. Valuation

In the conventional cash-financing models, a venture is launched only if its expected net value at time-0 is nonnegative. In the kind-financing model, proposed by this paper, the production operations, cooperation, and distributions are a multi-stage process where the viewpoints of all units (employees, principals, and agents) at each instant in time are taken into account in an interactive and productive manner (by altering the strategic courses in order to improve the venture's growth and viability). Therefore, a venture may be launched even if the net venture value at time-0 is negative, but has the promise of altering the outcome subsequently with the joint efforts of principals, agents, and employees. Under cash-financing, a company has to go through a lengthy bankruptcy procedure under the situation of continuous losses, while under kind-financing, bankruptcy process is moot since all the concerned parties are working in unison (during good times and otherwise). Efficient business operations under kind-financing and healthy business environment will produce positive venture values.

V_t = net value of the new-venture's expected cash flows at time t (t = 1, 2, 3,...,h-1, h, h+1, ..., n)

G_t = gross value of the new-venture's expected cash flows at time t
(t = 1, 2, 3,...,h-1, h, h+1, ..., n)

K_t = gross value of the new-venture's expected capital investments at time t
(t = 1, 2, 3,...,h-1, h, h+1, ..., n)

$V_t = G_t - K_t = 0$ (t = 1, 2, 3,...,h-1, h, h+1, ..., n)

$K_h = K_0(1+Y_1)(1+Y_2)(1+Y_3)...(1+Y_h)$

$K_n = K_0(1+Y_1)(1+Y_2)(1+Y_3)...(1+Y_n)$

Using time-0 as the pivotal point, the conventional venture-valuation models provide the following criterion for a new-venture's acceptability and rejectibility,

$V_0 \in (-\infty, 0)$, then the new-venture should not be undertaken

$V_0 \in [0, +\infty)$, then the new-venture should be undertaken

However, the use of time-0 as the pivot-point may lead to regrettable decisions. It is time-n or time-h (rather than time-0) that should be the focal point of time for decision making. This paper looks at the venture-values at all phases (every time-period during the holding horizon) to determine the acceptability or rejectibility of a venture:

0 = time when the venture is acquired or started by the entrepreneur

h = time when the venture is taken-over (friendly or hostile) by other entrepreneurs
n = terminal time period

{1, 2, 3, ..., h-1} intermediate points between the undertaken (start or acquisition) and overtaken

{1, 2, 3, ..., n-1} intermediate points between the initial time-period and the expiration of the product-life

Under the assumption that the entrepreneur will sell the venture (voluntarily or involuntarily) to other entrepreneurs at time-h:

$V_h \in (-\infty, 0)$, then the new-venture should not be undertaken

$V_h \in [0, +\infty)$, then the new-venture should be undertaken

Under the assumption that the entrepreneur will continue the venture until the end of the product-life:

$V_n \in (-\infty, 0)$, then the new-venture should not be undertaken

$V_n \in [0, +\infty)$, then the new-venture should be undertaken

$V = V(e, c, p, q, r)$

E = expansion rate, C = contraction rate, p = expansion probability, q = contraction probability, and R = opportunity cost rate.

$e = 1 + E$

$c = 1 + C$

$r = 1 + R$

$e = g(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

$c = s(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

$p = p(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

$q = q(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

$r = y(x_1, x_2, x_3,..., x_n; y_1, y_2, y_3,..., y_n; z_1, z_2, z_3,..., z_n)$

x_i = economic variables that affect the values of E, C, p, q, R, and the optimal time to acquire or be acquired-by other new-ventures

y_i = policy parameters (constantly varied by regulatory agencies) that affect the values of E, C, p, q, R, and the optimal time to acquire or be acquired-by other new-ventures

z_i = natural states or human-made conditions that affect the values of E, C, p, q, R, and the optimal time to acquire or be acquired-by other new-ventures

The impacting-variables could be e-expanding or e-diminishing, c-expanding or c- diminishing, p-expanding or p-diminishing, q-expanding or q-diminishing, y-expanding or y-diminishing, h-expanding or h-diminishing, and n-expanding or n-diminishing.

$V_k > Vk\text{-}1$ if $dV_k = \frac{\partial Vk}{\partial e} de + \frac{\partial Vk}{\partial c} dc + \frac{\partial Vk}{\partial p} dp + \frac{\partial Vk}{\partial q} dq + \frac{\partial Vk}{\partial y} dy > 0$

$V_k < Vk\text{-}1$ if $dV_k = \frac{\partial Vk}{\partial e} de + \frac{\partial Vk}{\partial c} dc + \frac{\partial Vk}{\partial p} dp + \frac{\partial Vk}{\partial q} dq + \frac{\partial Vk}{\partial y} dy < 0$

$V_k = Vk\text{-}1$ if $dV_k = \frac{\partial Vk}{\partial e} de + \frac{\partial Vk}{\partial c} dc + \frac{\partial Vk}{\partial p} dp + \frac{\partial Vk}{\partial q} dq + \frac{\partial Vk}{\partial y} dy = 0$

The necessary condition for ascending venture-values ($V_n > V_{n-1} > V_{n-2} >... V_3 > V_2 > V_1 > V_0$) is

$Y_k > p_k E_k + q_k C_k$, then $V_k > Vk\text{-}1 \quad \forall_k \in (0, n)$

for descending venture-values ($V_n < V_{n-1} < V_{n-2} <... V_3 < V_2 < V_1 < V_0$) is

$Y_k < p_k E_k + q_k C_k$, then $V_k < Vk\text{-}1 \quad \forall_k \in (0, n)$

for steady-state venture-values ($V_n = V_{n-1} = V_{n-2} =... V_3 = V_2 = V_1 = V_0$) is

$Y_k = p_k E_k + q_k C_k$, then $V_k = Vk\text{-}1 \quad \forall_k \in (0, n)$

However the stronger and sufficient condition for ascending venture-values ($V_n > V_{n-1} > V_{n-2} >... V_3 > V_2 > V_1 > V_0$) is

$[Y_1 Y_2 Y_3...Y_n]^{(1/n)} > [(p_1 E_1 + q_1 C_1)(p_2 E_2 + q_2 C_2)(p_3 E_3 + q_3 C_3)...(p_n E_n + q_n C_n)]^{(1/n)}$

for descending venture-values ($V_n < V_{n-1} < V_{n-2} <... V_3 < V_2 < V_1 < V_0$) is

$[Y_1 Y_2 Y_3...Y_n]^{(1/n)} < [(p_1 E_1 + q_1 C_1)(p_2 E_2 + q_2 C_2)(p_3 E_3 + q_3 C_3)...(p_n E_n + q_n C_n)]^{(1/n)}$

or steady-state venture-values ($V_n = V_{n-1} = V_{n-2} =... V_3 = V_2 = V_1 = V_0$) is

$[Y_1 Y_2 Y_3...Y_n]^{(1/n)} = [(p_1 E_1 + q_1 C_1)(p_2 E_2 + q_2 C_2)(p_3 E_3 + q_3 C_3)...(p_n E_n + q_n C_n)]^{(1/n)}$

VII. Concluding Remarks

The paper has demonstrated that kind-financing and forward kind-selling are superior to cash-financing and spot kind-selling. Kind-financing is akin to stock-financing, while the cash-financing is debt-financing. Likewise, forward-selling is risk-reducing, while spot-selling is risk-exposing. Contingent kind-financing eliminates moral hazards and agency-costs, enhances employee loyalty, and decreases operational-risks. Investors perceive the former as a less risky enterprise than the latter, and as such cash could be readily obtained should the need arise at any point in time. Input-suppliers help entrepreneurs expand their consumer base and curtail the interest costs. Net venture value can be negative at time-0, but this should not deter an entrepreneur from accepting the project as long as the venture values at the end of the holding value is positive. If the sum of the expected value of the business expansion rate and business contraction rate is higher than the desired rate of return during the subsequent periods, then the net venture value subsequently will be positive even if the initial value is negative (the venture should be adopted if the subsequent venture values are positive and rising). That means the adoption/rejection decision criterion should be based on the positivity or the negativity of the venture values at time-n (or time-h) and not at time-0. As the expected value of the expansion rate (that is, the sum of the expansion rate multiplied by the expansion-probability and the contraction rate multiplied by the contraction-probability) rises relative to the opportunity cost rate, the venture becomes more promising. Entrepreneurs succeed in tying up the interests of input-suppliers and output-buyers with their new ventures. Good management, improved economic conditions, kind-financing, and forward-selling could shift the ventures with negative values into positive domains during subsequent time periods.

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A Survey of Corporate Social Responsibility Reporting Practices of Australian and U.S. Financial Services Firms

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Abstract

Current concern over a variety of environmental and social issues such as global warming, treatment of labor around the world, and the depletion of natural resources has caused stakeholders of firms to renew their interest in corporate social responsibility (CSR) reporting. This study examines the extent of CSR reporting used by firms in the financial services sector listed in the US S&P 500 and the Australian ASX 200. The CSR reporting by 25 Australian and 79 US firms was compared to the supplemental environmental and social performance indicators for the financial services sector established by the Global Reporting Initiative (GRI). The results of the study indicate discrete reports produced by a firm provided the greatest amount of information on CSR issues relative to coverage provided in annual reports. Although firms in both countries were found to report their codes of conduct in their corporate governance documents, the level of disclosure of a large number of environmental and social performance indicators by the largest firms in the financial services sector fell well short of meeting the GRI guidelines.

I. Introduction

The topic of corporate social responsibility (CSR) is particularly timely given the theme of this year's MBAA meeting is "Focus on Change: Succeeding in a Global Environment." The idea of firms reporting on the social and environmental impact of their business operations has its roots in the 1970s (Tsang, 1998; Mathews, 1997). Stakeholder interest in this kind of reporting waned in the 1980s as the focus of business shifted to facilitating the expansion of global economic activity. Much of this activity took place in countries such as China and Russia when they began moving to a market-based economy. The mid-1990s saw a surge in interest in CSR reporting as it relates to strategic decision-making as social and environmental concerns such as global warming, depletion of natural resources, and treatment of labor in lesser developed countries began to emerge. Firms around the world are beginning to include CSR as part of their culture in a genuine attempt to reflect social and environmental impacts of their business operations thereby enhancing their financial performance.

The rationale behind CSR means a firm accounts for social, environmental and ethical consequences that result from the operation of the business (Robins, 2006a). 'Triple Bottom Line' accounting (TBL) is a new measure of the degree that CSR has been included in strategic decision-making (Deegan 2002; Elkington, 1998). TBL includes in the firm's balance sheet, financial (economic), environmental, and social consequences of business strategy. TBL is growing in use around the world because it provides a growing accepted measure of a firm's performance in an investment world increasingly concerned about issues of quality of life on earth. The fact that investment in U. S. professionally managed portfolios that used social and environmental criteria to screen investment opportunities surged to more than $2.3 trillion in

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2005 is evidence of the growing interest in CSR (Robins, 2006b). Investment in funds that stress socially responsible investing is also growing in Australia (van der Laan & Lansbury, 2004)

A number of reporting guidelines have been developed to assist firms in their reporting of CSR issues. In some cases, countries have mandated financial reporting of environmental and social issues. For example, the United Kingdom (UK) requires companies listed on stock exchanges in the UK to provide an Operating and Financial Review in their annual report that describes any ethical, social and environmental aspects of their strategies, performance and future plans (KPMG, 2005). However, most countries allow firms to voluntarily report on most CSR issues. The US and Australia are two such counties.

In the current study, the Global Reporting Initiative (GRI) guidelines are used to evaluate the scope of CSR reporting by the financial firms listed in the US S&P 500 and the Australian ASX 200. Australia was selected to be compared to the US as it has a similar business climate. Legislation that governs business in Australia often mirrors laws enacted in the US. For example, the US enacted the Sarbanes-Oxley Act in 2001 after the accounting scandals involving Enron and WorldCom and Australia passed in 2004 the Corporate Law Economic Reform Programme after several large corporate collapses occurred in Australia (Robins, 2006a). If there is a difference between the two countries in the way firms are managed, it may be due to the fact that Australia has a history of relying on voluntary compliance with guidelines rather than civil and criminal enforcement of their laws regulating business practices (Robins, 2006a).

II. CSR Reporting and GRI Guidelines

CSR has been defined as a company's ethical behavior towards society. CSR reports usually include narratives related to workplace issues (e.g., recruitment policies and employee development), environmental issues, community involvement, and corporate governance and codes of conduct (O'Donovan, 2002). TBL extends CSR reports to include a financial measure of the above issues. While surveys have shown that company executives overwhelmingly believe CSR reports can deliver benefits to a firm (i.e., enhanced reputation), relatively few executives report they have made progress in implementing a CSR strategy (SustainAbility, 2006; KPMG, 2005; Watson & MacKay, 2003; Dickson, 2002; O'Donovan, 2002).

Detailed disclosure of environmental and social impacts of a firm's business operations remains elusive in countries that allow voluntary reporting. The annual report is often used as the vehicle to communicate to stakeholder groups the information that is environmental and social in nature (Tilt 2001; Mathews 1997). The Center for Australian Ethical Research (CAER, 2005) found that such information in annual reports is primarily targeted to employees. Hogner (1982) and Wilmshurst and Frost (2000) suggest firms report the social and environmental impacts of their business operations because it legitimizes their business activities. They predict that firms will disclose more information on environmental and social performance of the firm if more groups of stakeholders demand it. To date, the treatment of these issues is superficial because few, if any, stakeholder groups pressure firms to provide greater disclosure, and may only serve as a promotional device (Tilt 2001; Gray, Kouhy & Lavers 1995).

The GRI was established in 1997 by the Coalition for Environmentally Responsible Economies (CERES) and the United Nations Environment Programme (UNEP). Although the

original intent of the GRI was to foster environmental reporting, the GRI guidelines were expanded to include social and economic issues in 2002. In 2006, the GRI guidelines were revised to expand to include 79 performance indicators covering six categories: environmental, human rights, labor practices, society, product responsibility and economic (GRI 2007). Fifty of the performance indicators are labeled 'core' or those indicators that are considered to be of interest to most stakeholders. Twenty-nine performance and performance indicators are labeled 'additional,' or those that are considered to be emerging practice or topics that may be of interest to only some stakeholders. In addition, supplemental performance measures have been developed for various business sectors. Exhibit 1 and Exhibit 2 contain the 33 supplemental social and environmental performance indicators for firms in the financial services sector. Finally, the GRI guidelines encourage firms to seek independent assurance of the accuracy of their reports.

More than 1,000 companies throughout the world use the GRI guidelines to voluntarily report the social, environmental and economic performance of their business (CERES, 2006a). Research on the use of the GRI guidelines is only now beginning to emerge in the literature. A recent survey of Fortune's Global 250 firms by KPMG (2005) found the most common tool used to develop report content was the GRI guidelines. Moneva, Rivera-Lirio and Munoz-Torres (2007) explored the quality of CSR reports on financial performance of Spanish companies. They reported that although there was a positive relationship between using the GRI guidelines and financial performance, the relationship was not statistically significant. Furthermore, firms in the financial services and real estate investment sectors generated the weakest relationship. Galbreath (2006) examined the strategic benefits of stakeholder management as defined by corporate governance, employee management, environment performance, and social impact. Galbreath (2006) reported corporate governance and employee management were positively and significantly associated with a firm's financial performance. However, environmental performance and social impact had a negative and significant association with a firm's financial performance.

The current study contributes to the growing body of literature on the use of the GRI guidelines by conducting a content analysis of CSR information reported by the financial services firms listed in the US S&P 500 and Australian ASX 200. The financial services sector was selected because the detailed information required by the supplemental performance indicators of the GRI guidelines gives a comprehensive picture of the social and environmental consequences of investments made in other businesses.

III. Methodology

The production of CSR reports is an expense beyond the normal financial reporting requirements of firms listed on stock exchanges in the US and Australia. Therefore, it is expected that only the largest firms would be able to afford this added expense of reporting. In addition, since CSR reports are meant for a firm's stakeholders, it was assumed that publicly traded firms would be the most likely ones to prepare a CSR report because they have more external stakeholders. Therefore, the firms selected for the sample were taken from those listed on the ASX 200 and the S&P 500. The ASX 200 was selected because it represents 88.2% (July 2007) of the capitalization of the firms listed on the Australian Stock Exchange (ASX). The

S&P 500 represents the US firms with the largest capitalization listed on US stock exchanges. The financial service firms listed on these exchanges were identified by SIC.

Each firm's discrete CSR reports and annual reports were examined for use of the GRI G3 supplemental social and environmental performance indicators listed in Exhibits 1 and 2. The supplemental and environmental performance indicators were selected because they are specific to the financial services sector. The standard disclosures of the GRI guidelines are already required by Australian and U.S. regulations. For example, publicly traded companies must report corporate governance and ensure report quality as part of Australian and U.S. reporting requirements, as well as, being part of the GRI guidelines. In addition, the GRI database was examined to see if each firm had voluntarily listed its report with the GRI and whether the report was independently checked under the GRI G3 guidelines.

The web sites of the firms in the sample were examined for discrete CSR reports and annual reports on 25 Australian and 79 US financial services firms. The content of the discrete CSR reports and annual reports were analyzed following the method used by Frost *et al.* (2005). The content of each report was judged by one of the researchers using the five point scale developed by SustainAbility (2006) as presented in Table 1. To more accurately assess the amount of disclosure for each indicator, firms with measures of '0' for a particular indicator were excluded from the computation of the mean scores. A mean score was determined for each criterion to arrive at an overall assessment of the use of the supplement environmental and social performance indicators of the GRI guidelines for the financial service sector in the US and Australia.

IV. Results

Table 2 indicates the number of companies in each country listed in the US S&P 500 and ASX 200 that disclosed the information on the social and environmental performance indicators listed in Exhibit 1 and Exhibit 2. The most common sections reported by firms in the US were descriptions of corporate governance and codes of conduct. Fifty-five of the US financial services firms listed a separate corporate governance or code of conduct document. The high number of firms producing separate documents is probably due to the Sarbanes-Oxley Act. This Act requires the open reporting of such information. Only nine of the Australian financial services firms listed a separate corporate governance or code of conduct on their web sites.

All US and Australian firms reported the remuneration of senior management and board of directors (INT4). Again, this information is required by regulatory agencies in each country. Fifty-two US financial services firms (65.8%) provided a description of stakeholder dialogue and involvement procedures (CSR6) compared to nine (36%) of the Australian firms. Slightly more US firms (34.1%) provided a description of the procedures for handling issues sensitive to stakeholders and responsiveness (CSR4). Twenty-eight percent of the Australian firms provided this description. Finally, seventeen (21.5%) of the US firms and eight (32%) of the Australian firms reported contributions to charitable causes, community investments and commercial sponsorships (SOC1).

More than double of the proportion of Australian versus US firms reported descriptions of social elements of their corporate social responsibility policy (CSR1), and structure and relevant corporate social responsibilities (CSR2).

The mean score in terms of disclosure paralleled the number of firms that reported information on the supplemental social and environmental performance indicators. US firms scored relatively higher than Australian firms on describing social elements of their CSR policy (CSR1), describing the structure and relevant CSR responsibilities (CSR2), and reporting remuneration of senior management and board of directors (INT4). Australian firms provided more disclosure on describing procedures for handling issues sensitive to stakeholders (CSR4), describing stakeholder dialog and involvement procedures (CSR6), and reporting contributions to charitable causes (SOC1).

Although relatively few sample firms addressed the environmental performance indicators (F1-F13), proportionally more Australian firms did include the indicators. Firms in both countries did not do a good job of reporting these indicators. This is perhaps because most of the social performance indicators require only descriptions of processes rather than hard figures. The environmental performance indicators are more detailed in terms of amount and type of information that must be reported.

V. Discussion

This study examined the extent that the largest 79 US and 25 Australian firms in the financial services sector meet the GRI G3 sector supplemental social and environmental performance indicators. Overall, firms in both countries do not come close to meeting the standards of the GRI guidelines in terms of the information that they choose to report. This result is similar to previous studies (Baue 2006). Understandably, the highest rates of reporting are for information that is required to be disclosed by the regulatory agencies in each country. In the case of US and Australian firms, external stakeholders (i.e., investors, analysts) need to push for the disclosure of additional information on social and environmental impacts of a firm's business operations before such information is forthcoming (CERES 2006b). Until this happens, the focus of management will likely remain on short-term performance as the additional investment in time and resources cannot be justified in a highly competitive global environment. In addition, the costs in terms of staff time and checking data to ensure it is in compliance with the GRI guidelines can be significant.

The GRI report database was examined in an effort to gain further insight into the use of all of the GRI guidelines by Australian and US financial services firms included in the study's sample. It was thought that a firm would only choose to include its CSR reports in the GRI database if it was in fully compliance of the guidelines. Four US financial services firms (Bank of America, Citigroup, State Street Corporation, and Wells Fargo) and three Australian financial services firms (Australia and New Zealand Banking Corporation, National Australia Bank Ltd. and Westpac Banking Corporation) listed their CSR reports in the GRI database. Of the seven firms, only Citigroup, Australia and New Zealand Banking Corporation and National Australia Bank Ltd. had their reports independently checked by GRI for assurance of adherence to the guidelines. Westpac Banking Corporation self-checked its report for assurance of adherence to the guidelines.

Current credit crisis that is impacting the financial services sector worldwide prevented the testing of whether firms that adhere to the GRI guidelines are more profitable. Future research may explore this issue once the turbulence surrounding the credit markets settles down.

This study has some limitations that need to be highlighted when interpreting the results. First, only the largest financial firms listed in the S&P 500 and ASX 200 were included in the sample. It could be that smaller firms have a higher rate of reporting of the supplemental social and environmental performance indicators as a way to legitimize themselves and attract investors and customers that are motivated to seek out socially responsible firms. Testing for differences in reporting by size of firm is not possible given the 2006 revision of the GRI guidelines provides relatively few data points for analysis. Future research may be able to test for a possible difference based on size of firm by creating sub-groups as more data become available. In addition, privately held companies may differ in their reporting of these indicators depending on what is demanded by their stakeholders.

A second limitation is that only one judge scored the amount of coverage of these indicators. The study needs to be replicated with two more judges completing the content analysis so interjudge reliability can be computed and resolution of disagreements in scoring can be completed through normally accepted means.

A third limitation in the study is that it used the GRI supplemental indicators to assess the firms' disclosure of certain social and environmental information. Although the GRI guidelines are followed by over 1,000 firms worldwide, other organizations have developed different measures. The current study tried to address this possibility by judging the extent of the coverage of the topics contained in the indicators rather than using a discrete 'addressed' or 'not addressed' measure for each guideline.

Exhibit 1. Supplemental Social Performance Indicators for Financial Services Sector

Management System

CSR1 CSR Policy: Description of social elements of the CSR policy, including corporate definition of CSR

CSR2 CSR Organization" Description of the structure and relevant CSR responsibilities, including explanation of the installed procedures

CSR3 CSR Audits: Number of audits and auditor hours

CSR4 Management of Sensitive Issues: Description of the procedures for handling issues sensitive to stakeholders and responsiveness

CSR5 Non-Compliance: Number of non-compliance incidents with any law or regulatory code of conduct

CSR6 Stakeholder Dialogue: Description of stakeholder dialogue and involvement procedures

Internal Social Performance

INT1 Internal CSR Policy: Description of social responsibility issues covered in the company's human resources policies

INT2 Staff Turnover and Job Creation

INT3 Employee Satisfaction: Employee satisfaction, based on survey results, covering: job security, remuneration & benefits, work/life balance, training & development, internal communications, company's social performance towards society

INT4 Senior Management Remuneration: Remuneration of senior management and board of directors

INT5 Bonuses Fostering Sustainable Success: Bonuses that are not oriented purely towards short term financial success, but which contain additional sustainability elements

INT6 Female-Male Salary Ratio: Ratio of female to male salaries including bonuses per hierarchy level

INT7 Employee Profile: Employee profile per hierarchy level and country according to gender, ethnicity and disability

Performance to Society

SOC1 Charitable Contributions: Contributions to charitable causes, community investments and commercial sponsorships

SOC2 Economic Value Added: 'Value added' expresses the economic value created by a company's activities

Suppliers

SUP1 Screening of Major Suppliers: Policy and procedures to screen suppliers' social performance

Performance towards Suppliers

SUP2 Supplier Satisfaction: Supplier satisfaction with prompt payment, prices and treatment

Asset Management

AM1 Asset management Policy (socially relevant elements): Social criteria applied by the reporting organization in Asset management

AM2 asset under Management with High Social Benefit: Provision of tailored and innovative products and services applying special positive ethical/sustainability criteria

AM3 SRI Oriented Shareholder Activity: Description of activities with companies invested in, where CSR issues either are raised in communications with board and management or explicitly considered when exercising shareholder rights

Exhibit 2. Supplemental Environmental Performance Indicators for Financial Services Sector

Management System

F1 Description of environmental policies applied to core business lines
F2 Description of process(es) for assessing and screening environmental risks in core business lines
F3 State the threshold(s) at which environmental risk assessment procedures are applied to each core business line
F4 Description of processes for monitoring clients' implementation of and compliance with environmental aspects raised in risk assessment process(es)
F5 Description of process(es) for improving staff competency in addressing environmental risks and opportunities
F6 Number and frequency of audits that include the examination of environmental risk systems and procedures related to core business lines
F7 Description of interactions with clients/investee companies/business partners regarding environmental risks and opportunities
F8 Percentage and number of companies held in the institution's portfolio with which the reporting organization has engaged on environmental issues
F9 Percentage of assets subjected to positive, negative and best-in-class environmental screening
F10 Description of voting policy on environmental issues for shares over which the reporting organization holds the right to vote shares or advise on voting
F11 Percentage of assets under management where the reporting organization holds the right to vote shares or advise on voting
F12 Total monetary value of specific environmental products and services broken down according to the core business lines
F13 Value of portfolio for each core business line broken down by specific region and by sector

Table 1. Measurement Scale

Nothing = 0	The report provides no information on the criteria.
Sketchy = 1	Coverage suggests the company recognizes the criterion to some degree and is attempting to present it in a serious way.
Systematic =2	Coverage suggests the company is taking the criterion seriously and is seeking to present the information systematically. Overall there is a sense that the company is on the right track in terms of satisfying the criteria.
Extensive = 3	Coverage is serious and systematic, and does not suffer from major gaps in coverage, presentation or interpretation.
Integrated = 4	Reporting is serious, systematic and extensive, and evidence is given that shows how reporting in this area is linked to general business decision-making and core processes to improve sustainable development effectiveness.

Table 2. Comparison of US and Australian Financial Service Firms on Supplemental Social and Environmental Performance Indicators

	US Firms			Australian Firms		
Indicator	# of Firms	% of Total	Mean	# of Firms	% of Total	Mean
CSR1	8	10.10%	2.75	6	24%	2.33
CSR2	8	10.10%	2.62	5	20%	2.6
CSR3	4	5.00%	1.75	3	12.50%	1.33
CSR4	27	34.10%	1.96	7	28%	2.28
CSR5	1	1.26%	2	3	12.50%	1
CSR6	52	65.80%	2.2	9	36%	2.44
INT1	8	10.10%	1.75	7	28%	1.14
INT2	1	1.26%	2	3	12.50%	2
INT3	8	10.10%	1.75	7	28%	1.14
INT4	79	100%	2.32	25	100%	2.2
INT5	1	1.26%	1	3	12.50%	1.33
INT6	8	10.10%	1.25	7	28%	1.14
INT7	1	1.25%	2	3	13%	1.66
SOC1	17	21.50%	1.81	8	32%	2.75
SOC2	1	1.26%	2	3	12.50%	1
SUP1	5	6.30%	1.2	3	12.50%	1
SUP2	1	1.26%	2	3	12.5%	1
AM1	1	1.26%	2	3	12.5%	1.66
AM2	1	1.26%	2	3	12.5%	1.33
AM3	1	1.26%	2	3	12.5%	1
F1	1	1.26%	2	3	12.5%	1.66
F2	1	1.26%	2	3	12.5%	1.66
F3	1	1.26%	2	3	12.5%	1.33
F4	1	1.26%	2	3	12.5%	1.33
F4	1	1.26%	2	3	12.5%	1.33
F5	1	1.26%	2	3	12.5%	1.33
F6	1	1.26%	2	3	12.5%	1.33
F7	1	1.26%	2	3	12.5%	1.33
F8	1	1.26%	2	3	12.5%	1.33
F9	1	1.26%	2	3	12.5%	1.33
F10	1	1.26%	2	3	12.5%	1.33
F11	1	1.26%	2	3	12.5%	1.33
F12	1	1.26%	2	3	12.5%	1.33
F13	1	1.26%	2	3	12.5%	1.33

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A Case Study of Firm Valuation Measures and the Reversal of Fortune Among 7 Rivers Equity Index Firms

Thomas M. Krueger

Abstract

This article represents an attempt to provide readers with insight regarding common valuation metrics and how these can be applied to real companies. The same analysis could be applied in alternative settings and results compared to those presented here.

I. Introduction

The 7 Rivers Region of Eastern Minnesota and Western Wisconsin runs from just south of Minneapolis, Minnesota to just north of Madison Wisconsin. Within this region, The 7 Rivers Alliance is a regional leadership group that boosts economic growth by fostering collaboration in western Wisconsin, southeast Minnesota, and northeast Iowa. The 7 Rivers Alliance brings together public and private resources to forge entrepreneurial growth, and serves as a clearinghouse of vital information to enhance quality of life in the region. One of the pieces shared with regional leaders is insight to the performance of publicly held local companies, known as the 7 Rivers Equity Index.

Over the seven years from 2000 to 2007, publicly held firms in the 7 Rivers area earned an annualized rate of return of 8.1%. By contrast, the Dow Jones Industrial Average rose at an annualized rate of only 1.4%, and the Standard & Poor's 500 fell at by about 0.6% yearly. However, much of the performance difference can be tied to the fact that local companies were a bit more insulated from the dot.com bust, 9/11 terrorist attack, and beginning of the Iraqi War which took place early in this century. Over the December 2003 - July 2006 period, all three measures of stock market activity had similar rates of return; the 7 Rivers Index rose by sixty-three percent, the Dow Jones Industrial Average rose by forty-nine percent, and the Standard & Poor 500 rose by sixty-one percent.

However, there appears to have been a reversal of fortune in 2007! The 7 Rivers Equity Index dropped by 8.5 percent. By comparison, during our most recent year with complete data, the Dow Jones Industrial Average and Standard & Poor's 500 rose by 6.5% and 3.5%, respectively. However, the local stock performance was similar to that of the Russell 2000.

Could the relatively poor difference among 7 Rivers firms be the result of woes in the subprime market, questionable political leadership, $3 oil prices, limited industry representation in the 7 Rivers region, or specific company events? The remainder of this report will examine the investment prospects of firms in the 7 Rivers Index. The next section of this report presents the 7 Rivers Equity Index and its performance in comparison to national stock market performance. Those companies which have contributed the most to the success of the 7 Rivers index will be identified. The remainder of this report focuses on the investment merits of local companies. Research tools used in this investigation include Value Line, Morninstar.com, and my.zacks.com. This article lays out a presentation that could be adopted to any reader's vicinity.

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II. The 7 Rivers Equity Index

Two criteria must be met for inclusion in the 7 Rivers Equity Index. One, the firm must be publicly held with share price data available from the financial press or Internet sources. Two, the company's headquarters must be within 100 miles of La Crosse, which includes the 7 Rivers Region. A listing of such companies is generated with the assistance of *ReferenceUSA*, a data service allowing one to screen public corporations by state. The thirteen companies currently in the 7 Rivers Equity Index set are identified in Table 1.

Performance of the 7 Rivers Index, an equally-weighted index of regional companies, is presented in the first column of Table 2. The index is based on share prices, which are obtained from Yahoo!Finance. Index values are based on the assumption that investors reinvest their funds equally in public 7 Rivers companies on a monthly basis, earning the average rate of return on firms in the 7 Rivers Index over the ensuing period. The 7 Rivers Equity Index, like the comparison benchmarks described below, excludes dividends.

The values listed in Table 2 represent the value of $100 invested in local shares on 12/31/1999. For instance, in 2000 the value of the 7 Rivers Index dropped 9.3% to 90.7, meaning a $100 investment would have lost $9.30. Over the first eight years of this century, through December 2007, the 7 Rivers Index rose 47.0%, to 147.0. Meanwhile, $100 invested in the Dow Jones Industrial Average would have been worth only $115.4, a $15.40 increase over eight years! Worse yet, investors in the Standard and Poor's 500 companies would have experienced a dime loss per $100 invested. However, all indexes were outdone by the Russell 2000, which gained $51.80 per $100 invested.

Correlation statistics are presented in the bottom half of Table 2. The 7 Rivers Index' correlation with the Russell 2000 is 0.90. This is only second highest, behind the 0.95 correlation of the Dow Jones Industrial Average and S&P 500. The lowest correlation is that of the 7 Rivers Index and S&P 500. Figure 1 illustrates the index similarity described in Table 1.

III. Local Common Stock Characteristics

Risk and Return Insights from Value Line

As shown above, although local shares and the Russell 2000 have performed markedly better than the other two aggregate measures of stock market performance, local and Russell 2000 share prices dipped in 2007. Investors may be wondering whether this atypical performance is going to continue. In order to gain insight to this issue, information from Value Line Incorporated, Morningstar, and Zacks Investment Research was obtained. These firms are in the business of selling information. Hence, their focus is on producing accurate reports that are not necessarily biased towards the purchase of certain stocks. All information presented here is freely available at their web sites or most local libraries. Therefore, this analysis can be completed by all readers and shared with students, business leaders, or the public in general.

Value Line publishes more than a dozen print and electronic products, but is best known for *The Value Line Investment Survey*. Several measures of stock price performance are provided. Table 3 exhibits individual firm rankings and measures for the 7 Rivers firms covered by Value Line. The following paragraphs describe each measure and how some of the 7 Rivers firms size up on that metric.

Timeliness Ranking is Value Line's rating of a stock's probable performance over the next 6 to 12 months. Stocks ranked 1 (the highest) and 2 (above average) are likely to

outperform the market, while those ranked 4 (below average) and 5 (the lowest) are expected to underperform the market. As shown in the first row of Table 3, none of the 7 Rivers firms are in the extreme categories. The 2007 average Timeliness ranking is the better than it was, on average, over the prior three years.

Safety Ranking is Value Line's measure of the potential risk associated with an individual stock's financial strength (e.g., financial leverage) and price stability (e.g., stock price variance). As shown on the second row of Table 3, Hormel and HMN Financial are considered the most secure, while none of the 7 Rivers firms have a safety rating below 3. The Safety Rankings have been very stable and better than the overall average of 3.0, for all firms in the Value Line universe, over the 2004 to 2007 period.

Technical Ranking is Value Line's predictor of a stock's short-term (three to six months) relative price change. As shown in the third row of Table 3, none of the 7 Rivers companies are in the extreme technical rating levels. However, the current average technical rating is better than it was during the prior three years.

Institution Buy/Sale Ratios allow one to compare the performance and implied sentiment of professional money managers. The 1.6 values for Heartland Financial and Rochester Medical indicate that institutional investor purchases exceed sales by sixty percent. Overall, the number of institutional purchases versus sales is up slightly from the 2004-2006 average.

Price Stability, given in fifth row of Table 3, is based on a ranking of the standard deviation of weekly price changes over the past five years. Value Line reports price stability on a scale from 100 (highest) to 5 (lowest) in increments of 5. While HMN Financial has the highest possible price stability rating, Renaissance Learning and Rochester Medical's price stability rating is quite low. These values are approximately the same as they were in prior years, which is not a surprise because four of the five years used in creating the measure are identical.

Price Growth Persistence, exhibited in the sixth row of Table 3, is Value Line's proprietary measure of the tendency of share prices to rise when compared to other stocks. With ratings of 95 and 90, respectively, Fastenal and Hormel have had the most persistent stock price growth. A Price Growth Persistence rating of 15 makes sense for Wausau-Mosinee Paper, which experienced a share price rise of $7.62, followed by a loss $6.47 over the past five years, Price Growth Persistence is perhaps the best trend among local firms, with values rising from 37, to 42, to 46, and now to 57 over the past four years.

Beta measures, exhibited in the seventh row of Table 3, are reported by Value Line with a regression towards the mean using a proprietary model. Not surprisingly, industrial concerns Fastenal and Wausau-Mosinee Paper are the most sensitive to market conditions. Meanwhile, the maker of upholstered furniture for use in homes, businesses, and recreational vehicles, Flexsteel, has the lowest sensitivity to market conditions. With an average beta of 0.8, local firm beta values have consistently been defensive. However, as witnessed in 2007, the 7 Rivers Index and some stock market benchmarks can go in opposite directions.

Dividend yield, which is exhibited in the eighth row of Table 3, is the ratio of the dividend payments over the next twelve months, as estimated by Value Line, divided by the current price. Several 7 Rivers companies pay dividends at a rate exceeding what local investors would receive on savings accounts, with National Presto leading the way at 6.5%. Overall, there has been a slight rise in dividend payments per dollar invested.

Price projections, given in the last two rows of Table 3, are Value Line's estimate of the annual, compound total rate of return for the largest firms in the 7 Rivers Index. Yields are

based on appreciation from the current price to both the high and low ends of the anticipated price range in three to five years. Unfortunately, Value Line makes these predictions only for a select group of typically larger firms. While share prices for Wausau-Mosinee common might grow at a twenty-nine percent annual rate, Hormel's best, projected annual performance is only sixteen percent. Value Line thinks that, at worst, Wausau-Mosinee Paper will provide a capital gain of nineteen percent, while Fastenal's price, at worst, might rise at a ten percent rate. The current average maximum growth rate is lower than it was in the 2004-2006 period. However, the current estimated minimum growth rate is higher than before.

Valuation Insights from Morningstar

Morningstar is an investment research firm providing commentary, portfolio management tools, and detailed reports on stocks and mutual funds accessible at www.morninstar.com. After signing up for a free membership, one can access a great deal of free information. This report studies the pricing of securities, relative to earnings, sales, and cash flow, which is presented in Table 4. One advantage of Morningstar's investigation is that all public firms have a share price and are likely to have earnings, sales, and cash flows. The lone exception to this comprehensive coverage assumption is Baraboo Bancorporation, which is not covered by Morningstar. Citizens Community Bank, Flexsteel, National Presto, Rochester Medical, and TenderCare International did not have positive earnings, TenderCare had a negative cash flow, but all had sales.

Price/Earnings ratios divide a stock's current price by the company's trailing 12-month earnings per share. Generally, the higher the price/earnings ratio the more confident the investor is that the firm will provide earnings growth in the future. As shown in the first column of Table 4, approximately half of the firms with positive earnings had price/earnings ratios exceeding their industry average, which is exhibited in the second column. Investors appear to be very confident about the future prospects of Fastenal, where twenty-five years of current earnings (i.e., without earnings growth) would be necessary to pay for the stock. Since few would wait that long to be reimbursed, investors must be expecting significant earnings growth at Fastenal. The 2007 average price/earnings ratio is much lower than the 2005-2006 average. However, it exceeds the 2007 relevant industry ratio and the 2007 S&P 500 companies' price/earnings ratio, both of which declined from earlier levels.

Price/Sales ratios, exhibited in the center columns of Table 4, divide a company's current price by sales per share over the past twelve months. Price/sales ratios are commonly considered in conjunction with price/earnings ratios, because even companies with negative earnings produce sales. Generally, confident investors pay more for shares, which implies that they will pay more per dollar of sales. As with the price/earnings ratio, some of the 7 Rivers Index companies appear to be richly valued when it comes to earnings. Reviewing the center two columns of Table 4, only five of twelve local firms had price/sales ratios exceeding their industry average. Confident investors are paying almost six dollars per dollar of sales at Rochester Medical. By comparison, investors in Flexsteel are only paying twenty cents per dollar of sales.

Overall, there has been a reversal in what investors are willing to pay the most per dollar of sales. During the 2005-2006 period, buyers of 7 Rivers shares were paying a lower price per dollar of sales. In 2007, 7 Rivers Region company investors are paying more than those investors would in other firms in the same industries. However, the average price/sales ratio of the five hundred firms in the Standard & Poor 500 is higher yet.

Price/cash flow ratios, presented in the right columns of Table 4, divide a company's current price by cash flow per share over the trailing 12 months. Price/cash flow ratios show the ability of a business to generate cash and can be an effective gauge of liquidity and solvency. The greatest valuation difference was that at Citizen's Community Bank, where investors are paying almost five times the industry average per dollar of cash flow. At the other extreme investors in Marten Transportation are only paying about forty percent of its industry average. The 2007 7 Rivers' price/cash flow values exceed the industry benchmark, both the 2005-2006 7 Rivers' firm and industry average , and the average of the Standard & Poor's 500.

Average Broker Recommendations from Zacks Investment Research

The paragraphs above present a significant amount of information regarding anticipated return, risk, and current valuations. Nonetheless, one still has to decide whether or not to buy a specific company. In order to gain insight to this process, average broker recommendations (ABRs) were obtained from Zacks Investment Research. ABRs, the number of analysts giving a recommendation, perceived pricing errors, industry rank, and company rank within their primary industry are exhibited in Table 5. Among those with at least four recommendations, Fastenal (2.29) has the highest average rating and Marten Transportation (3.00) the lowest average rating. On average, local companies have a rating of 2.4, which is between "Outperformance Expected" and "Hold (current position)." Although the average ABR is only down slightly from 2006, the number of raters has fallen by over fifty percent.

An important insight provided by Zacks is a ratio of the firm's estimated value relative to its current value. The estimated value of Wausau Paper is ninety-one percent higher than the current value. At the other extreme, Fastenal is only considered to be worth four percent more than its current price—which would be absorbed by transaction costs and taxes.

Zacks also ranks industries and firms within industries on the basis of expected price performance over the coming year. The larger the values in columns four and five of Table 5, the better the anticipated performance of the industry (in column 4) and firm (column 5). The fourth column of Table 5 shows that National Presto and Hormel are considered to be in two of the better industries. In six of the eleven instances with data, the 7 Rivers company comes from an industry that is considered to be above average.

Of course, the 7 Rivers firms may be stars in otherwise lackluster industries. For instance, Marten Transportation and Wausau Paper are in the top quarter of industries that fall into the bottom third in the industry ranking. By contrast, Flexsteel is in the bottom third within an industry that is in the bottom third of 207 industries. While the 2007 industry percentile is 15 (53 – 38) points higher than it was in 2006, the firm ranking within the industry has dropped by 6 (58-52) percentage points.

IV. Summary

This report covers the7 Rivers Equity Index, a measure of the share price performance of firms located in the local area. Local firms have outperformed large-cap stock market benchmarks during this decade, though the difference eroded significantly during 2007. Only one of the firms currently in the 7 Rivers Index have experienced a decline since 2000. By contrast, the share prices of only four of thirteen local companies rose during 2007.

Three web sites available to readers at no charge were used to examine the investment value of local companies. Virtually all of the common stock characteristic measures bode well for 7 Rivers firms, including currently having a higher Timeliness ranking, technical rating,

institutional buy/sell ratio, price stability, price growth persistence rating, and dividend yield, versus average value from the 2004 - 2006 period. Firm valuation measures, including higher average prices per dollar of earnings, sales, and cash flow, when compared to industry benchmarks, suggest that investors are confident about the continued success of local companies. Investors appear not to have been shedding 7 Rivers companies as quickly as earnings, sales, and cash flow have fallen, resulting in high valuation measures. Although broker ratings of local firms within their respective industries may have declined slightly, the forecast performance of the industries has increased dramatically. All in all, this analysis paints an optimistic picture of local firms and the 7 Rivers economy and the potential for another reversal of fortune.

Table 1. 7 Rivers Equity Index

The headquarters of each of these public firms is within 100 miles of La Crosse

Firm	Market Capitalization ($millions)	Line of Business
Wisconsin firms		
Baraboo Bancorporation (BAOB)	$ 80	Retail banking
Citizens Community Bank (CZWI)	$ 57	Retail banking
Marten Transportation (MRTN)	$ 363	Trucking
National Presto (NPK)	$ 430	Cookware
Renaissance Learning (RLRN)	$ 408	Educational software
TenderCare International (TCAR)	$ 3	Paper products distribution
Wausau-Mosinee Paper (WPP)	$ 423	Paper products
Minnesota firms		
Fastenal (FAST)	$ 6784	Threaded fasteners
HMN Financial (HMNF)	$ 75	Savings & loan
Hormel (HRL)	$ 5222	Pork and turkey processing
Rochester Medical (ROCM)	$ 139	Urinary treatment products
Iowa firms		
Flexsteel Industries (F LXS)	$ 73	Home furnishings
Heartland Financial USA (HTLF)	$ 362	Retail banking

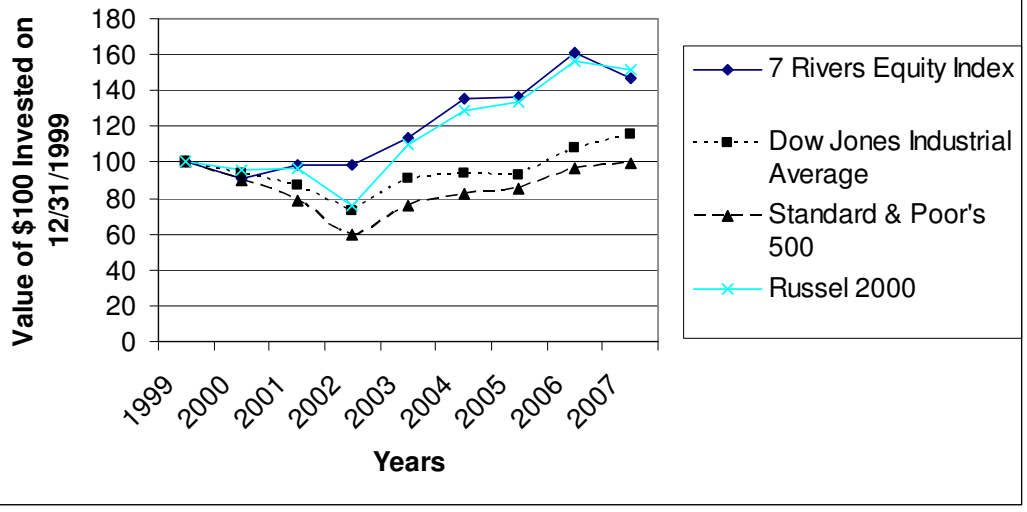
Firms included in the La Crosse Equity Index that are no longer publicly held:

Ag Services of America	Bone Care International	Featherlite
First Federal Capital Corporation	La Crosse Footwear	Land's End
Northland Cranberries	Pemstar	Sheldahl
State Bank La Crosse		

Table 2. Comparative Index Performance

Index Values				
Year-end	7 Rivers Equity Index	Dow Jones Industrial Average	Standard & Poor's 500	Russell 2000
1999	100.0	100.0	100.0	100.0
2000	90.7	93.8	89.9	95.8
2001	98.6	87.2	78.2	96.8
2002	98.1	72.6	59.9	75.9
2003	114.0	91.0	75.7	110.3
2004	135.8	93.8	82.5	129.1
2005	136.5	93.2	85.0	133.4
2006	159.5	108.4	96.5	156.0
2007	147.0	115.4	99.9	151.8
Index Correlation				
7 Rivers Equity Index		0.78	0.66	0.93
Dow Jones Industrial Average			0.95	0.90
Standard & Poor's 500				0.82

Figure I. Comparative Index Performance



3. Common Stock Characteristics for 7 Rivers Equity Index Members

Data Provided by Value Line Investment Survey[a]

	Fastenal	Flexsteel	Heartland Financial	HMN Financial	Hormel	Marten Transportation	National Presto	Renaissance Learning	Rochester Medical	Wausau-Mosinee Paper	**2007 Average**	**2004 – 20006**
Timeliness Ranking	3	3	3	3	4	2	-	4	2	2	2.9	3.1
Safety Ranking	3	3	3	1	1	3	3	3	3	3	2.6	2.6
Technical Ranking	2	2	3	3	3	2	-	3	2	4	2.7	3.0
Institution Buy/Sale Ratio	1.1	1.4	1.6	1.4	1.1	0.8	1.4	0.7	1.6	1.1	1.2	1.1
Price Stability	60	85	75	100	95	30	85	25	25	65	64	62
Price Growth Persistence	95	40	-	75	90	90	50	30	30	15	57	42
Beta	1.2	0.4	0.6	0.6	0.8	0.6	0.8	1.1	0.7	1.2	0.8	0.8
Dividend Yield (%)	1.0	3.5	1.5	2.9	1.6	0.0	6.5	1.7	0.0	2.5	2.1	1.6
3- to 5-Year Projected Returns												
Maximum	20	na	na	na	16	na	na	27	na	29	23	25
Minimum	10	na	na	na	11	na	na	15	na	19	14	10

[a] Value Line does not cover the other firms in the 7 Rivers Index. Specific 3- to 5-year projected returns are only provided for the 1700 largest firms.

Table 4. Current Share Valuation using data provided by Morningstar.com[a]

	Price/Earnings		Price/Sales		Price/Cash Flow	
	Firm	**Industry**	**Firm**	**Industry**	**Firm**	**Industry**
Citizens Bank	NMF	14.2	3.2	3.4	44.8	9.6
Fastenal	25.0	19.2	3.8	0.4	58.8	23.7
Flexsteel	NMF	15.1	0.2	0.6	5.8	10.5
Heartland	11.8	14.2	2.5	3.4	15.7	9.6
HMN Finance	11.2	11.3	3.0	2.8	4.1	---
Hormel	15.3	18.2	0.8	1.0	16.1	17.0
Marten Trans	11.4	16.8	0.6	1.7	4.0	9.7
National Presto	NMF	15.1	2.2	0.6	21.3	10.5
Renaissance	31.5	19.9	3.4	3.5	17.0	18.2
Rochester Med	NMF	21.6	5.8	3.5	4.4	26.2
TenderCare	NMF	17.1	1.1	0.8	---	12.5
Wausau Paper	15.3	17.1	0.5	0.8	14.6	12.5
2007Average[b]	17.4	16.7	2.3	1.9	20.2	14.8
2005-06 Average[b]	25.1	21.1	1.9	2.4	20.0	15.0
2007 S&P 500:		15.8		2.9		15.0
2005 - 2006 Average S&P 500:		21.0		2.8		14.2

[a]Baraboo Bancorporation (WI) is too new to be included in Morningstar.
[b]Data was gathered on approximately August 1 of each year
NMV = Not a meaningful figure due to negative earnings, in NMF instances the industry value is excluded from calculation of the average.
--- = Not a meaningful value due to negative cash flow, in such instances the industry value is excluded from calculation of the average.

Table 5. Average Brokerage Recommendation (ABR) date provided by My.Zacks.com[a]

	ABR	Number of Ratings	Estimated Value Current Value	Industry Percentile Rank	Percentile Rank in Industry
Fastenal	2.29	7	1.04	54	50
Flexsteel	NA	NA	NA	30	35
HMN Financial	3.00	1	na	30	55
Hormel	2.38	8	1.12	92	14
Heartland Financial	3.00	2	1.41	11	67
Marten Transport	3.00	4	1.33	31	88
National Presto	1.00	1	na	98	100
Rochester Medical	NA	NA	NA	68	40
Renaissance Learning	3.00	1	1.31	77	16
TenderCare	NA	NA	NA	71	33
Wausau Paper	1.50	2	1.91	19	77
2007Average	2.4	3.2	1.35	53	52
2006 Average	2.2	6.7	1.30	38	58

[a]My.Zacks.com does not include analysis of Baraboo Bancorporation and Citizens Community Bank.

The Effect of Federal Open Market Committee on Major Stock Market Indexes

Jason Lin and Justin Junkel

Abstract

This project examined the impact of changes in the federal funds rate target on equity prices. The project used ordinary least squares regression to consider the effects of those changes along with corporate profits on stock market value. The goal of the project was to confirm the results of other more narrowly defined studies and in doing so show that the causal relationship is even stronger. The data sets were taken from 1990 through 2006, using the adjusted level of corporate profits and federal funds rate targets as explanatory variables and NYSE and NASDAQ composite indices as dependant variables. The results of this project showed that corporate profits were the largest driver of equity prices, as suggested by current research. It also showed that federal funds rate changes have no impact on equity prices in a direct fashion, because federal funds rate is not the rate directly faced by firms in the market. Overall results did confirm the findings of previous research.

I. Introduction

This paper examines the period from 1990 to 2006, during which time the overall equity markets had a brief period of falling value after the 1990 recession followed by long sustained increases in value until 2000. The federal funds rate target also trended upward after falling post recession. At the beginning of the 21st century the markets crashed, losing a large portion of the value gained. The federal funds rate target was taken to near historic lows following the crash.

The major goal of this project is to determine how the Federal Open Market Committee's (FOMC) changes of its federal funds rate target affect equity markets. Most current studies look at how unanticipated changes affect the market using very sophisticated methods. This study aims to confirm the results of other studies while looking at both anticipated and unanticipated changes. It is the hope of the study that if it can be shown that the same relationships can be seen using a simpler approach it will demonstrate how strong and pervasive those relationships are. In order to add some additional insight and as a basis for comparison, the project also tracked corporate profits as a driver for equity markets. The methodology used was regression analysis. This report will briefly review the literature on this topic to explain the underlying principles, data, and methodology, and will present the final empirical result of the selected models and analysis.

II. Review of Literature

Existing research in this field is relatively extensive and when compared to this project considerably more complex and involved. The general consensus of existing research and theory is that as interest rates rise the prices of underlying equity assets will fall (Bernanke and Kuttner). The mechanism that causes the price to change can be seen in two key areas of business operations: changes in corporate capitalization rates and changes in expected cash

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flows. Changes in interest rates alter the amount of profitable long-term capital investments, which greatly influence expected cash flows. The amount of profitable future investments and the cost of capital a firm faces affect stock prices by changing dividend forecasts and yields and free cash flows, which affect firms' valuation and affect real output in the economy (Bernanke and Kuttner 1223; Gatti and Gallegati 112). Thorbecke also points out that changing interest rates will change the discount factors firms use in project evaluation; this in turn will affect the profitability of the project (635).

The other critical piece of information that is found in existing research is that stock prices will only change when changing conditions represent new information even though those changes will affect the real economy (Gatti and Gallegati 102). So, if a given change in the Federal Funds Rate (FFR) target is fully anticipated, then the stock prices should not move with the announcement. That is to say that stock prices reflect all currently available information about the underlying company and economy. That is not to say that the change in the FFR had no effect on equity valuations, merely that this effect was priced in over time. This makes the effects extremely difficult to capture.

Interestingly, most current research indicates that the transmission mechanisms discussed above are due mostly to changes in the expected future excess returns of a stock and very little on any actual changes in real interest rates (Bernanke and Kuttner 1223; Lobo 139; Ehrmann and Fratzscher 719-20). Changes in real interest rates caused by changes in federal funds rate targets do affect real economic activity by changing borrowing costs and default risks. The effects on stock values appear to be more attributable to these changes in real economic activity than to interest rates. Bernanke and Kuttner also find evidence that equity markets do respond more strongly to changes viewed as permanent (1253). This further shows that changes in real interest rates themselves do not cause stock prices to move because only permanent changes in federal funds rate targets reflect the Fed's expectations of future economic conditions. Lobo also notes that there is some evidence that the markets react stronger to rate hikes than cuts (139). Ehrmann and Fratzscher find some evidence that the causality between rate changes and stock prices may go both ways (722). Just as federal funds rate target changes may indicate the Fed's expectations for future economic conditions, so may changes in stock prices reflect expected changes in economic conditions that may require changes in federal funds rate targets. This has interesting implications for monetary policy, which attempts to influence the real economy by changing the real interest rates prevalent in the economy.

III. Data and Methodology

Most of the existing studies focus on examining the effects of unanticipated changes in monetary policy and the FFR target. This project attempts to focus on the overall effect of a change in the FFR target, anticipated or not. This project used the following explanatory variables: federal funds rate target, corporate profits adjusted for inventory valuation and depreciation, and a dummy variable to test for a recession effect. The dummy variable is defined as having a value of one during a recession and a value of zero otherwise. The biggest decision was which equity indexes to track; in order to cover the most complete picture of the equity markets it was decided that the project should cover both the NASDAQ and the NYSE. This provides a very complete picture of the market because the NASDAQ is very heavily concentrated in technology and telecommunications and the NYSE covers virtually all other

sectors of the economy. A review of recent literature and simple observation of the markets reveals that various index measures are so highly correlated that the choice was likely to have nearly no impact on the outcome, provided that the indexes chosen were U.S. domestic indexes and that they covered all major economic sectors.

The indexes tracked were the NYSE composite index and the NASDAQ composite index. This choice was based on market coverage and also on availability of data; each could be downloaded in Excel format from the same site. The S&P 500 was not tracked as its high correlation with the NYSE composite index would likely not have yielded significantly different results. During the study period the economy was coming out of the 1990 recession and entered what became the longest expansion in history. The indexes rose consistently throughout the 90s, with decreasing volatility. At the turn of the millennium the markets crashed, particularly the NASDAQ. This caused an increase in volatility that, following a short recession, gave way to another bull market. The FFR was rising following the recession in 1990 and continued until the markets crashed when it fell to record lows. The recession dummy variable was selected to determine if the market reacted differently to FFR changes when the economy was in a recession, as defined by National Bureau of Business Research (NBER) business cycle data.

As mentioned earlier, this project attempted to capture both the anticipated and unanticipated effects of an FFR target change. This represents a different methodology from most previous research. The most generally accepted methodology for capturing unanticipated effects is to use FFR futures market data to construct an event study. This methodology works well, but is highly sophisticated and doesn't capture the anticipated effects that are priced in over time. The distinction between unanticipated and anticipated effects is not important to this project. With this goal in mind, the best method for capturing both effects is to expand the time interval of the data to be sufficiently long to capture both effects. A one month interval seemed most appropriate as a longer interval increases the risk of distortion in the data from other events. A shorter time interval may not capture the gradual pricing of the anticipated portion of any rate announcement. This was also the smallest data interval available for corporate profits.

Originally the model was envisioned to use changes in the values of the indexes, corporate profits, and FFR on a month to month basis to capture the effects; this was a log-log functional form. The first problem with this was that FFR changes are in regular intervals and are typically in small stepwise increments. This introduced considerable statistical anomalies into the data and seemed inappropriate given the project's goal of looking at the bigger picture. The data turned out to support simply looking at the values of the variables, a linear-linear form. This produced the least amount of distortion in the results. The data points, when plotted against the dependent variable, showed a significantly linear relationship and other forms did not fit sufficiently better to justify the added complexity.

Initially the study hoped to use a much larger time period to improve the accuracy of the results. The major problem with this was the Fed did not announce changes in its FFR target until the late 80s, and until the mid-90s these announcements were less than regular. This automatically limited the data set to no earlier than approximately 1990, the time at which very accurate estimates of the FFR targets are available if they were not announced. The other major issue was that corporate profit measures are adjusted for inventory valuation and depreciation.

Each data source has a slightly different method for making these adjustments, and the exact methodology used to make these adjustments was unknown. Without this information it was unclear if the data from different sources was comparable, nor could the data sources be normalized. Thus it was determined that using a single source would be most appropriate for the corporate profits data.

Accurate measures of corporate profits were not available for 2007 or beyond. At the time this study was conducted it was still the 2nd quarter of 2007 and very few companies had released results. Estimated data was available for approximately four months, but this data is often subject to considerable revision. Given the limited number of observations this would have added it did not seem to justify the possible distortions inaccurate data could have caused. In the interest of not distorting the data, the time period that captured the largest date range given these restrictions was July 1990 through December 2006. This was a long enough period to have a relatively large sample size and thus decent results. Given the data, variables, and manner in which the model was constructed the final step was to outline a detailed hypothesis.

Theory and empirical research indicate that it is reasonable to expect that corporate profits will be shown to have a strong, positive, and statistically significant relationship with equity values in both the NYSE and NASDAQ models. The federal funds rate target variable is somewhat more difficult to predict. Generally interest rates have negative impacts on equity market values; this should be expected in this model. Current research has shown that the relationship between the federal funds rate target and equity market valuations is indirect. Thus, it may be more difficult for a model as general as the one constructed here to detect this relationship. It is hypothesized that the federal funds rate target will be negatively related to equity valuation with a moderate level of statistical significance (perhaps only at the 10% level). Finally, it is hypothesized that the recession dummy variable will have a negative relationship to equity market value and will be statistically significant.

IV. Empirical Results

The final empirical result has two different regression models: one for the NYSE and one for the NASDAQ. The final model for the NYSE is, where FFRT is federal funds rate target, CP is corporate profits, and R is recession dummy:

NSYE = 3829.7 -6.2360(FFRT) +1.6568(CP) -204.52(R)

P-Values	(.002)	(.914)	(.005)	(.037)

The p-values show that only the intercept and corporate profit variables were statistically significant to a high degree. The recession dummy variable is also significant and is negative, which would imply that during a recession the relationship between the markets and the FFR and profits is somewhat different. More specifically, during a recession all variables seem to have dampened effects and the function is lower for all values of FFRT and CP. The model did have significant positive first order autocorrelation, which is not uncommon with time series data. The above values are corrected for the autocorrelation. The model had an r-square of .7347, an adjusted r-square of .7306, and an F-statistic of 179.121 (p-value 0.00). The F-statistic does show that the model has significant overall explanatory power.

The model was tested for multicollinearity using auxiliary regressions and detected no multicollinearity, with the highest r-square of .1052. The model was tested for heteroskedasticity using diagnose/het command in Shazzam and none was found. There was no evidence to support the existence of a heteroskedastic partition or proportional heteroskedasticity. A reset test was performed to check for misspecification and there was significant misspecification. This is probably because the model does not capture anywhere near the entire list of explanatory variables that influence the markets and the time interval of the explanatory variables is relatively long. This problem afflicts the NASDAQ model as well. Clearly, corporate profits have a large amount of influence on the market. This is logical, and confirms the findings of other studies, because profits determine future ability to finance investments using retained earnings and thus reduce borrowing costs. The FFRT does not appear to have any affect on the markets; at first this seems contradictory, but current research suggests that the effect of interest rates on future cash flows and returns affects stock prices. These effects are more closely captured in this model by the corporate profit variable than by the FFRT variable.

The results of the NASDAQ model are as follows:

NASDAQ = 10422 +1861.4(FFRT) +15.836(CP) -1911(R)

P-Values	(.521)	(.255)	(.243)	(.525)

This model is also corrected for significant positive first order autocorrelation. The model does not show that any of the explanatory variables are significant and also has a low r-square of .3397 (adjusted r-square of .3295) and a low F-statistic of 33.270, though the F-statistic has a p-value of 0.00. This suggests that the overall model has some explanatory power beyond what each individual variable contributes. This model has no multicollinearity like the first, with the highest r-square in auxiliary regressions being .1052. It has very minor heteroskedasticity in a very small number of the tests, performed using the same command as above, which indicates that it is not severe enough to require correction, indeed it may not even exist. Heteroskedasticity was detected in only three of the eight tests without any real significance. A reset test did find the same misspecification problem as the NYSE model.

Overall, these models seem to show that corporate profits have the largest impact on equity market prices and that recessions or FFR targets seem to matter little, if at all. In fact, nothing seems to explain the NASDAQ, which will be addressed later. The idea that corporate profits have a larger impact should not be surprising, because higher profits mean more cash on hand for capital expenditures, paying dividends, and paying creditors, which reduces the firm's risk and lowers financing costs. Therefore, high profits dampen the impact of high interest rates. Also, the FFR is not the rate firms face in the market; that rate is determined by a plethora of sources and information. Federal funds rate changes may not track all that well with changes in a firm's cost of capital.

The separation of the federal funds rate from the market rate that firms face means that the federal funds rate itself has little direct impact on the value of stocks. Other studies have found very strong correlations between the federal funds rate and stock prices. Most of those studies used unanticipated changes in federal funds rate targets, but it is possible that the reaction of stock prices to target changes was more a function of what unanticipated changes say about

the Fed's expectations of economic conditions than a result of the change in interest rates. It is also likely that a general model, like the one constructed here, would not be able to detect the indirect effects, leading to low p-values for the FFRT variable. This finding is consistent with current works that show FFR changes affect stock values mostly through excess returns and not real interest rate changes. These conditions in turn affect corporate profits and thus stock prices. The recession variable's weak significance is probably due to the very small number of recessions found within the data set, and those very mild, but recessions do seem to depress market values across the board.

The NASDAQ model's unusual results, that none of the explanatory variables individually were significant but that overall the F-statistic showed the model had some explanatory power, were quite vexing. This project did not determine a definite explanation for this, but may suggest a possible explanation that could be the topic of future research. During the mid-to-late 90s, the stock market was in a bubble which eventually crashed around the turn of the century. It is possible that a bubble, which is self-sustaining for a time, could break down the ordinary relationships that affect equity market prices. This could have resulted in the relatively low significance of the FFR and corporate profits for both models. The psychology of the markets changed with the introduction of new technologies. Investors were convinced that these technologies would pay off and so hope and expectations were no longer based on rational considerations.

The result was that corporate profits and other drivers no longer had as large of an impact on stock prices. Many investors, particularly non-institutional, may have believed that others in the market knew something they did not and thus they continued to buy and later sell with the crowd. The most interesting piece of evidence is that the NASDAQ fell much further than the NYSE when the bubble burst, so it is logical to assume that the NASDAQ was being influenced even less by the normal drivers. That would seem to be exactly what this project's results suggest: the NASDAQ showed no significant relationship to the expected drivers while the NYSE did show a relationship. Attempts to restrict the data range to exclude the bubble failed. The remaining data set was not large enough, and did not exhibit sufficient change in the FFR variable to have any statistical relevance. A more sophisticated methodology is needed to disentangle the effects of the bubble. Also, in the future, longer data ranges will give greater insight.

In summary of the empirical results it is useful to outline exactly how these results compared to the working hypothesizes. For the NYSE model the corporate profits and recession dummy variables matched predictions. The corporate profits variable was positively related to market value and the relationship was highly significant. The recession dummy variable was negatively related to market value and the relationship was significant at the five percent level. The federal funds rate target variable did not generate the hypothesized results. The variable was negative as predicted, but the relationship was extremely insignificant having a p-value of .914.

The NASDAQ model did not generate the anticipated results. None of the explanatory variables were statistically significant and the federal funds rate target variable did not even have the expected sign. Overall this model did not conform to expectations; possible explanations for this were discussed above.

V. Conclusion

In conclusion, this project seems to suggest that the relationships supported by more sophisticated models hold even using a much more generalized model. This supports the claims of those studies by showing that a more pervasive and strong relationship exists. Clearly the major driver of equity value is expected future cash flows and opportunities that were captured by the corporate profit variable. The federal funds rate does affect stock prices, but only indicates changes in excess rates and expected cash flows. This study also uncovers an explanation for the strong correlation between federal funds rate changes and stock prices that has been observed in other studies. Specifically, the FOMC's decision to change the FFR target affects stock valuations mostly by altering the FOMC's perceived economic outlook. The stock market bubble of the 90s does distort the results somewhat and makes any definitive conclusion impossible. A more targeted and sophisticated study could possibly disentangle the effects and would be an interesting future research topic. Overall, this project achieved its goal of verifying the results of more sophisticated studies and opened the door for future studies.

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Decision Rules, Candlesticks, and Spreadsheets in Teaching Market Efficiency

Marshall J. Horton and James Files

I. Introduction

This paper shows how students can construct spreadsheets using publicly available data to test market efficiency in the weak sense using historical data. The results produced by this method indicate that the candlestick approach does not help in stock selection. In fact, any trading rule that can be expressed by a series of inequalities can be used with this approach, showing the student first hand that stocks are indeed efficient. The authors hope that investment instructors, who want students to see for themselves that markets tend to be efficient, will find utility in this method in the classroom.

A commonplace in teaching investment theory is the student who knows that he or she can "beat the market." Heedless of the academic literature on the Efficient Markets Hypothesis (EMH) (Fama 1970; Malkiel 1973), some students may question the numerous studies that have found technical analysis to be of little or no value. The weak form of the EMH, found in every investments textbook, states that investors have already used all past price information in agreeing on the prices that the market currently reports. Therefore, past price information for a stock is of no value in predicting future movements of the stock's price. But this is a tough sell for students who have dreams of retiring at age thirty after a few years of day-trading.

A lesser known technique for charting, the Japanese method of "Candlestick Charting," purports to provide signals for an investor to collect pure arbitrage profits from buying and selling stocks. The subject of more than twenty products currently offered at Amazon.com, Candlestick Charting was popularized in this country by Nison (1991). Three leading investments textbooks mention this technique with no evauation of its effectiveness (Corrado and Jordan 2005, Mayo 2006: Strong 2007). This omission could lull students into believing that candlesticks, because they use more information than just closing prices, may be effective when simpler charting methods are not. In a study using mutual fund data, Caginalp and Laurent (1998) found potential benefits to using simple trading rules based on candlesticks. Marshall, Young, and Rose (2006), concluded that candlestick methods had no informational value for the Dow Jones Industrial Average, affirming the weak form of the efficient markets hypothesis. Horton (2008), extending Caginalp and Laurent's decision rules and using a larger data set with individual stock price data, rejected the effectiveness of candlestick methods and affirmed that stocks are weakly efficient.

II. The Candlestick Method

The method is simple to apply. It requires the following information for the financial asset: Opening Price, High Price, Low Price, and Closing Price. These four pieces of information can be used to construct a figure called a "candlestick." The interval between the opening price and closing price is the body of the candlestick, colored white if the close exceeds the opening and colored black if the opening exceeds the close. The distance by which the low

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price is less than this interval, if any, is called a "shadow" and is represented by a line segment over the distance. The distance by which the high price is greater than this interval, if any, is called a "wick" and is represented by a line segment over the distance. Wicks and shadows can be of virtually any length, including zero.

The required data (from Commodity Systems, Inc., CSI) are easily obtainable for free on Yahoo Finance using the "Historical Price" option that appears as a menu item after the stock's ticker symbol has been entered. Furthermore, the daily data are easily downloadable into Excel spreadsheet files and Chart Wizard for quick analysis. Better yet, Caginalp and Laurent (1998) and Horton (2008) provided simple decision rules that can be readily used in spreadsheets to evaluate the effectiveness of such trading rules. A short discussion of the candlestick signals and related decision rules follows.

Table I shows one week's worth of daily data for IMAX Corporation. Figure 1 plots the candlestick chart for these data. This function is standard on Excel spreadsheets.

Candlesticks for which the market closed higher than it opened are white, while candlesticks for which the market closed down are black. Figure 1 shows two "Doji." A doji is defined to be a session in which the daily closing price was the same as the daily opening price.

The subjective nature of candlestick charting might frustrate analysts. If students are required to plot the data for companies of their own choice, they will experience first-hand just how hard it is to see the signals that candlestick "experts" find. This approach is useful for actively involving students in the exercise and avoiding the use of a pedagogically sterile "black box."

III. Methodology

Following Caginalp and Laurent (1998), Horton (2008) analyzed more than 300 stocks from Commodity Systems Inc. (CSI) via Yahoo Finance using the following "bull" or "bear" market signals. They found no predictive power from any of the candlestick signals and concluded in favor of weak market efficiency.

The following section, in which the market signals are described, follows Caginalp and Laurent and/or Horton very closely. These signals were presumably chosen over many others because they are the most objective of the candlestick signals and are therefore most readily programmed by the investor (or student).

Bull Market Signals:

- *Three White Soldiers* (TWS) – a downtrend followed by three long, white, candlesticks in a row which close at progressively higher prices

- *Three Inside Up (TIU) – a downtrend followed by a black day that contains a small white day that succeeds it followed by a white candle that closes with a new high for the three days*

- *Three Outside Up (TOU) – a downtrend followed by a large white day that engulfs the first day's body amid rising prices and is followed by a white candle that closes with a new high for the three days.*

- *Morning Star* (MS) – a downtrend continues in a long, black, day and is followed by a downward gap and a small body, either black or white, after which prices reverse, closing past the midpoint of the first day's body.

Bear Market Signals:

- *Three Black Crows* (TBC) – an uptrend followed by three long, black, candlesticks in a row which close at progressively lower prices.

- *Three Inside Down*(TID) – an uptrend followed by a white day that contains a small black day that succeeds it followed by a black candle that closes with a new high for the three days.

- *Three Outside Down* (TOD) – an uptrend followed by a large black day that engulfs the first day's body amid falling prices and is followed by a black candle that closes with a new low for the three days.

- *Evening Star* (ES) – an uptrend continues in a long, white, day and is followed by an upward gap and a small body, either black or white, after which prices reverse, closing past the midpoint of the first day's body.

A downtrend is defined as when the three-day moving average declines for at least five of six successive days. An uptrend is defined as when the three-day moving average declines for at least five of six successive days.

Caginalp and Laurent (1998) were very careful to derive decision rules to illustrate each signal. For example, the Three White Soldiers signal equates to the following nine inequalities:

$C_i > O_i$ for $i = t+1, t+2, t+3$
$C_{t+3} > C_{t+2} > C_{t+1}$
$C_{t+1} > O_{t+2} > O_{t+1}$
$C_{t+2} > O_{t+3} > O_{t+2}$

where C denotes closing price and O denotes opening price.

For the eight signals described above, Horton used Caginalp and Laurent's decision rules to detect the presence of bull and bear signals. In addition, he used the additional bear signal of the Doji described above in connection with Figure 1.

IV. The Spreadsheet Representation

Table II provides the basic price data downloaded into a spreadsheet directly from Yahoo Finance Historical Prices for the ticker symbol AA (Alcoa Aluminum).

Of course, the data continue for many rows. Considering the period from January 2, 1992, through March 13, 2007, would entail over 3,800 rows. Table III contains the Excel formulas for the first several rows of the columns that the students would construct. While the formulas appear complicated at first glance, they are actually no more than nested "IF," "THEN," and "OR" statements with additional use of means and absolute values. These columns contain all of the decision rules from Caginalp and Laurent (1998) and Horton (2008). The students would need to copy these formulas down the relevant number of rows.

Of most importance is the summary row, row 2. This row simply sums up the items in the columns with the number of uptrends (T), downtrends (U), the candlestick indicators' accurate predictions of uptrends (V), and their accurate prediction of downtrends (W). As can be seen from the spreadsheet, out of 802 uptrends, the candlestick indicators predicted only thirty-five. Of the 751 downtrends, the indicators predicted only seventy-two. The other 1,446 missed trends represent lost opportunities for profits.

Perhaps more telling are the entries in the final two columns, X and Y. These two columns represent "false positives" in the sense that the candlestick indicators predicted a trend, but in the wrong direction. The candlestick indicators incorrectly predicted an uptrend twenty-five times in advance of an actual downtrend and incorrectly predicted seventy downtrends in advance of an actual uptrend. The model makes almost as many false signals as it does accurate signals. Further, the model makes numerous "false negative" signals, causing the investor to miss opportunities by doing nothing because the model is silent before an actual market movement. Table IV illustrates the "false positive", "false negative", "true positive" and "true negative" signals from this sample.

These results, readily obtainable by the student using commonly available software and data, indicate that the candlestick approach does not help in stock selection. In fact, any trading rule that can be expressed by a series of inequalities can be used with this approach, showing the student first-hand that stocks are indeed efficient.

Other candlestick indicators could be used, such as the harami, cross, and hanging man, but they are beyond the scope of this study since they have not yet appeared in the academic finance literature. Adherents of the Japanese Candlestick approach may point out additional signals that should be used to evaluate turning points. A useful follow-up to the approach outlined in this paper would be for students to investigate some other candlestick signals such as haramis, crosses, and hanging men and construct spreadsheets to evaluate their use. In addition, some rules-of-thumb regarding candlesticks, for example, the persistence of a particular pattern or combinations of signals, are difficult to observe without graphics. The instructor should also employ the charts to show students the folly of trying to "time the market."

V. Conclusions

Japanese Candlestick Charting is an increasingly popular method for investors to try to make arbitrage profits in trading financial assets. Using open, close, high, and low prices, students can use decision rules from Caginalp and Laurent (1998) and Horton (2008) to evaluate the candlestick approach in particular and weak market efficiency in general. The data are readily available and Excel spreadsheets contain all the analytics that are necessary to convince students that past stock prices are of no value in predicting future stock prices.

Table I Daily Price Data for IMAX Corporation
January 15, 1996 – January 19, 1996

Date	Open	High	Low	Close
1/15/1996	24	24.63	23.5	24.5
1/16/1996	24.63	24.63	24.12	24.63
1/17/1996	24.63	26.13	24.12	26.13
1/18/1996	26.13	26.37	25.75	25.75
1/19/1996	26.25	26.25	25.75	26.25

Figure 1 Candlestick Chart for IMAX Corportation
January 15, 1996 – January 19, 1996

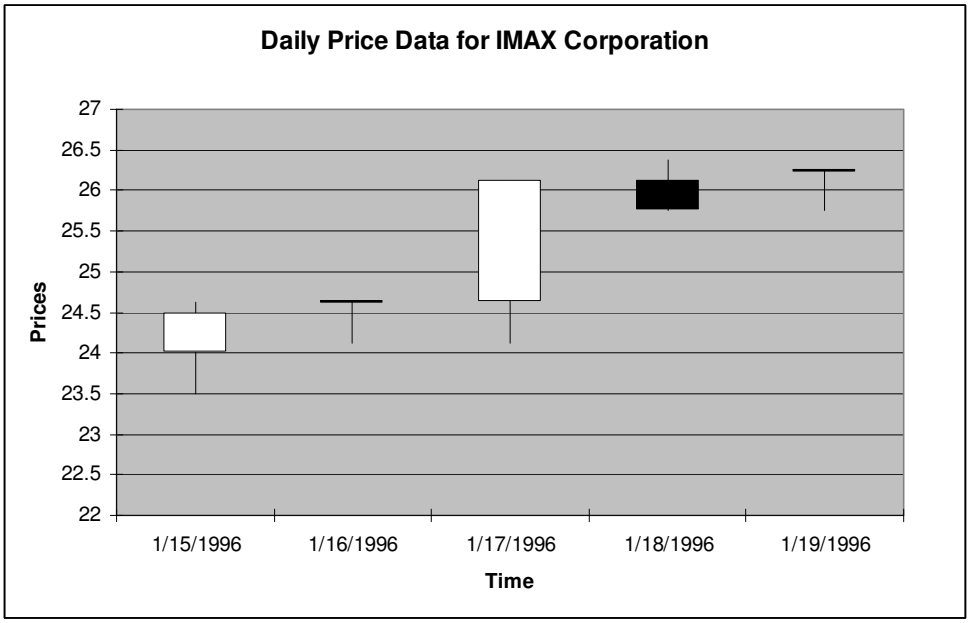

Figure 2 – Bull Market Signals
(preceding downtrends not shown)

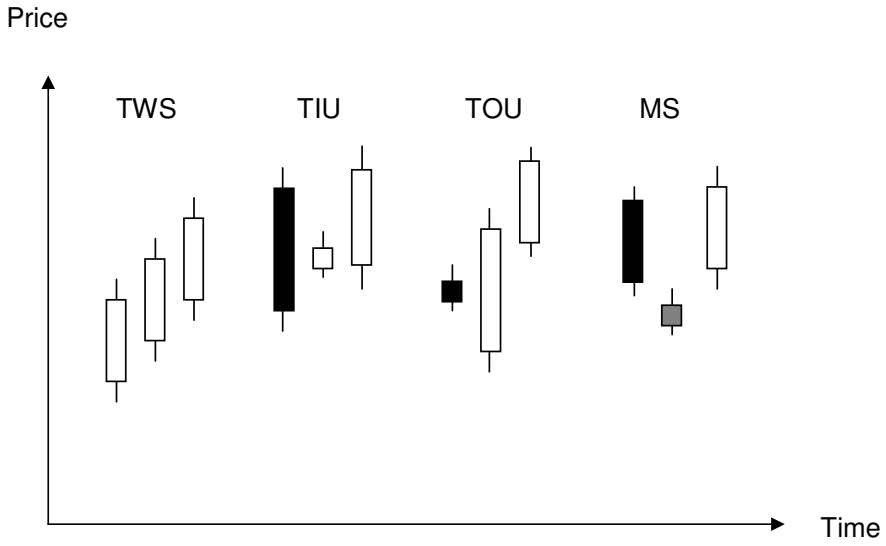

Figure 3 – Bear Market Signals
(preceding uptrends not shown)

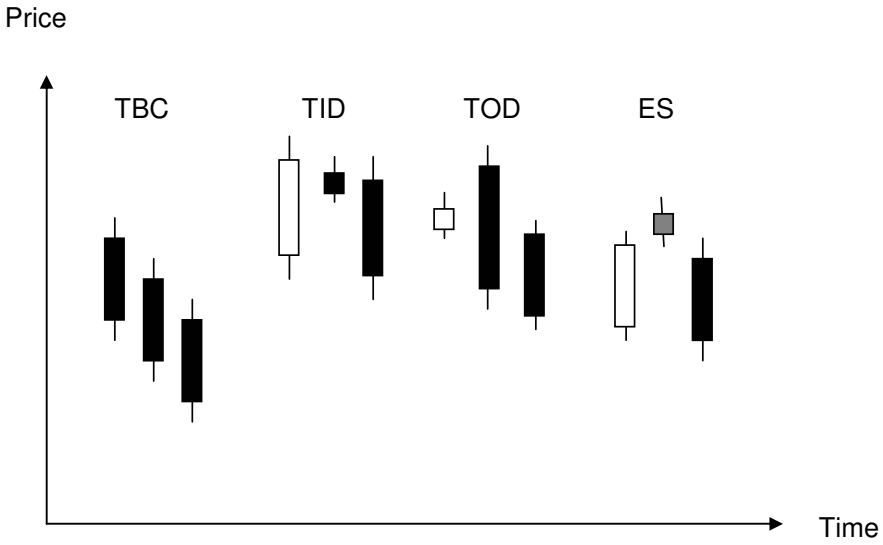

Table II Basic Price Data in Spreadsheet Form

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8	Date	Open	High	Low	Close
9	1/2/1992	64	64	63.38	64
10	1/3/1992	64	64.62	63.63	64.62
11	1/6/1992	64.37	64.37	63.5	64.12
12	1/7/1992	64.12	65	63.75	64.12
13	1/8/1992	64.12	65.62	63.5	64.25
14	1/9/1992	64.12	64.12	62.38	63
15	1/10/1992	63	63	62.5	62.75
16	1/13/1992	62.75	62.75	61.5	61.75
17	1/14/1992	61.75	62.63	61	62.5
18	1/15/1992	62.5	68	62.5	67.12
19	1/16/1992	67.12	69.5	67	68
20	1/17/1992	68	70.25	67.25	69

Table III Decision Rule Formulas

	F	Formulas for F	G	Formulas for G
1				
2				
3				
4				
5	3 day		Change	
6	Moving		in 3 day	
7	Average		Moving	
8	Close		Average	
9				
10				
11	64.25	=AVERAGE(E9:E11)		
12	64.29	=AVERAGE(E10:E12)	0.04	=F12-F11
13	64.16	=AVERAGE(E11:E13)	-0.12	=F13-F12
14	63.79	=AVERAGE(E12:E14)	-0.37	=F14-F13
15	63.33	=AVERAGE(E13:E15)	-0.46	=F15-F14
16	62.50	=AVERAGE(E14:E16)	-0.83	=F16-F15
17	62.33	=AVERAGE(E15:E17)	-0.17	=F17-F16
18	63.79	=AVERAGE(E16:E18)	1.46	=F18-F17
19	65.87	=AVERAGE(E17:E19)	2.08	=F19-F18
20	68.04	=AVERAGE(E18:E20)	2.17	=F20-F19

Table III Decision Rule Formulas (continued)

	H	Formulas for H
5	Ex	
6	Post	
7	Up	
8	Trends	
9		
16		

17	0	=IF(AND(G17>0,G16>0,G15>0,G14>0,G13>0,G12>0),1,
		IF(AND(G17>0,G16<0,G15>0,G14>0,G13>0,G12>0),1,
		IF(AND(G17>0,G16>0,G15<0,G14>0,G13>0,G12>0),1,
		IF(AND(G17>0,G16>0,G15>0,G14<0,G13>0,G12>0),1,
		IF(AND(G17>0,G16>0,G15>0,G14>0,G13<0,G12>0),1,
		IF(AND(G17>0,G16>0,G15>0,G14>0,G13>0,G12<0),1,
		IF(AND(G17<0,G16>0,G15>0,G14>0,G13>0,G12>0),1,0)))))))

18	0	=IF(AND(G18>0,G17>0,G16>0,G15>0,G14>0,G13>0),1,
		IF(AND(G18>0,G17<0,G16>0,G15>0,G14>0,G13>0),1,
		IF(AND(G18>0,G17>0,G16<0,G15>0,G14>0,G13>0),1,
		IF(AND(G18>0,G17>0,G16>0,G15<0,G14>0,G13>0),1,
		IF(AND(G18>0,G17>0,G16>0,G15>0,G14<0,G13>0),1,
		IF(AND(G18>0,G17>0,G16>0,G15>0,G14>0,G13<0),1,
		IF(AND(G18<0,G17>0,G16>0,G15>0,G14>0,G13>0),1,0)))))))

19	0	=IF(AND(G19>0,G18>0,G17>0,G16>0,G15>0,G14>0),1,
		IF(AND(G19>0,G18<0,G17>0,G16>0,G15>0,G14>0),1,
		IF(AND(G19>0,G18>0,G17<0,G16>0,G15>0,G14>0),1,
		IF(AND(G19>0,G18>0,G17>0,G16<0,G15>0,G14>0),1,
		IF(AND(G19>0,G18>0,G17>0,G16>0,G15<0,G14>0),1,
		IF(AND(G19>0,G18>0,G17>0,G16>0,G15>0,G14<0),1,
		IF(AND(G19<0,G18>0,G17>0,G16>0,G15>0,G14>0),1,0)))))))

20	0	=IF(AND(G20>0,G19>0,G18>0,G17>0,G16>0,G15>0),1,
		IF(AND(G20>0,G19<0,G18>0,G17>0,G16>0,G15>0),1,
		IF(AND(G20>0,G19>0,G18<0,G17>0,G16>0,G15>0),1,
		IF(AND(G20>0,G19>0,G18>0,G17<0,G16>0,G15>0),1,
		IF(AND(G20>0,G19>0,G18>0,G17>0,G16<0,G15>0),1,
		IF(AND(G20>0,G19>0,G18>0,G17>0,G16>0,G15<0),1,
		IF(AND(G20<0,G19>0,G18>0,G17>0,G16>0,G15>0),1,0)))))))

Table III Decision Rule Formulas (continued)

	I	Formulas for I
5	Ex	
6	Post	
7	Up	
8	Trends	
9		
16		
17	0	=IF(AND(G17<0,G16<0,G15<0,G14<0,G13<0,G12<0),1, IF(AND(G17<0,G16>0,G15<0,G14<0,G13<0,G12<0),1, IF(AND(G17<0,G16<0,G15>0,G14<0,G13<0,G12<0),1, IF(AND(G17<0,G16<0,G15<0,G14>0,G13<0,G12<0),1, IF(AND(G17<0,G16<0,G15<0,G14<0,G13>0,G12<0),1, IF(AND(G17<0,G16<0,G15<0,G14<0,G13<0,G12>0),1, IF(AND(G17>0,G16<0,G15<0,G14<0,G13<0,G12<0),1,0)))))))
18	0	=IF(AND(G18<0,G17<0,G16<0,G15<0,G14<0,G13<0),1, IF(AND(G18<0,G17>0,G16<0,G15<0,G14<0,G13<0),1, IF(AND(G18<0,G17<0,G16>0,G15<0,G14<0,G13<0),1, IF(AND(G18<0,G17<0,G16<0,G15>0,G14<0,G13<0),1, IF(AND(G18<0,G17<0,G16<0,G15<0,G14>0,G13<0),1, IF(AND(G18<0,G17<0,G16<0,G15<0,G14<0,G13>0),1, IF(AND(G18>0,G17<0,G16<0,G15<0,G14<0,G13<0),1,0)))))))
19	0	=IF(AND(G19<0,G18<0,G17<0,G16<0,G15<0,G14<0),1, IF(AND(G19<0,G18>0,G17<0,G16<0,G15<0,G14<0),1, IF(AND(G19<0,G18<0,G17>0,G16<0,G15<0,G14<0),1, IF(AND(G19<0,G18<0,G17<0,G16>0,G15<0,G14<0),1, IF(AND(G19<0,G18<0,G17<0,G16<0,G15>0,G14<0),1, IF(AND(G19<0,G18<0,G17<0,G16<0,G15<0,G14>0),1, IF(AND(G19>0,G18<0,G17<0,G16<0,G15<0,G14<0),1,0)))))))
20	0	=IF(AND(G20<0,G19<0,G18<0,G17<0,G16<0,G15<0),1, IF(AND(G20<0,G19>0,G18<0,G17<0,G16<0,G15<0),1, IF(AND(G20<0,G19<0,G18>0,G17<0,G16<0,G15<0),1, IF(AND(G20<0,G19<0,G18<0,G17>0,G16<0,G15<0),1, IF(AND(G20<0,G19<0,G18<0,G17<0,G16>0,G15<0),1, IF(AND(G20<0,G19<0,G18<0,G17<0,G16<0,G15>0),1, IF(AND(G20>0,G19<0,G18<0,G17<0,G16<0,G15<0),1,0)))))))

Table III Decision Rule Formulas (continued)

	J	Formulas for J
5		
6	Three	
7	White	
8	Soldiers	
9		
16		
17		
18		
19	0	=IF(AND(I17=1,E17>B17,E18>B18,E19>B19,B18>B17, B18<E17,B19>B18,B19<E18,E19>E18,E18>E17),1,0)
20	0	=IF(AND(I18=1,E18>B18,E19>B19,E20>B20,B19>B18, B19<E18,B20>B19,B20<E19,E20>E19,E19>E18),1,0)

Table III Decision Rule Formulas (continued)

	K	Formulas for K
5		
6	Three	
7	Inside	
8	Up	
9		
16		
17		
18		
19	0	=IF(AND(I17=1,B17>E17,OR(B17>B18,B17=B18),B18>E17,B17>E18, OR(E18>E17,E18=E17),OR(B17=B18,E18<>E17),OR(E18=E17,B18<>B17), E19>B19,E19>B17),1,0)
20	0	=IF(AND(I18=1,B18>E18,OR(B18>B19,B18=B19),B19>E18,B18>E19, OR(E19>E18,E19=E18),OR(B18=B19,E19<>E18),OR(E19=E18,B19<>B18), E20>B20,E20>B18),1,0)

Table III Decision Rule Formulas (continued)

	L	Formulas for L
5		
6	Three	
7	Outside	
8	Up	
9		
16		
17		
18		
19	0	=IF(AND(I17=1,B17>E17,OR(E18>B17,E18=B17), OR(E17>B18,E17=B18),ABS(E18-B18)>ABS(E17-B17),E19>B19,E19>B18),1,0)
20	0	=IF(AND(I18=1,B18>E18,OR(E19>B18,E19=B18), OR(E18>B19,E18=B19),ABS(E19-B19)>ABS(E18-B18),E20>B20,E20>B19),1,0)

Table III Decision Rule Formulas (continued)

	M	Formulas for M
5		
6		
7	Morning	
8	Star	
9		
16		
17		
18		
19	0	=IF(AND(I17=1,B17>E17,ABS(B18-E18)>0,E17>E18,E17>B18,E19>B19,E19>(B17-E17)/2),1,0)
20	0	=IF(AND(I18=1,B18>E18,ABS(B19-E19)>0,E18>E19,E18>B19,E20>B20,E20>(B18-E18)/2),1,0)

Table III Decision Rule Formulas (continued)

	N	Formulas for N
5		
6	Three	
7	Black	
8	Crows	
9		
16		
17		
18		
19	0	=IF(AND(H17=1,E17<B17,E18<B18,E19<B19,B18<B17, B19<B18,B19>E18,E17>E18,E18>E19,B17>B18,B18>E17,B18>B19),1,0)
20	0	=IF(AND(H18=1,E18<B18,E19<B19,E20<B20,B19<B18, B20<B19,B20>E19,E18>E19,E19>E20,B18>B19,B19>E18,B19>B20),1,0)

Table III Decision Rule Formulas (continued)

	O	Formulas for O
5		
6	Three	
7	Inside	
8	Down	
9		
16		
17		
18		
19	0	=IF(AND(H17=1,E17>B17,E17>B18,OR(B18>B17,B18=B17), OR(E17>E18,E17=E18),E18>B17,OR(B17=B18,E17<>E18), OR(E18=E18,B17<>B18),B19>E19,B17>E19),1,0)
20	0	=IF(AND(H18=1,E18>B18,E18>B19,OR(B19>B18,B19=B18), OR(E18>E19,E18=E19),E19>B18,OR(B18=B19,E18<>E19), OR(E19=E19,B18<>B19),B20>E20,B18>E20),1,0)

Table III Decision Rule Formulas (continued)

	P	Formulas for P
5		
6	Three	
7	Outside	
8	Down	
9		
16		
17		
18		
19	0	=IF(AND(I17=1,E16>B16,OR(B17>E16,B17=E16), OR(B16>E17,B16=E17),ABS(E17-B17)>ABS(E16-B18),B18>E18,E17>E18),1,0)
20	0	=IF(AND(I18=1,E17>B17,OR(B18>E17,B18=E17), OR(B17>E18,B17=E18),ABS(E18-B18)>ABS(E17-B19),B19>E19,E18>E19),1,0)

Table III Decision Rule Formulas (continued)

	Q	Formulas for Q	R	Formulas for R
5				
6				
7	Evening			
8	Star		Doshi	
9				
16				
17				
18				
19	0	=IF(AND(H17=1,E17>B17,ABS(B18-E18)>0, E18>E17,B18>E17,B19>E19, E19<(E17-B17)/2),1,0)	0	=IF(B19=E19,1,0)
20	0	=IF(AND(H18=1,E18>B18,ABS(B19-E19)>0 ,E19>E18,B19>E18,B20>E20, E20<(E18-B18)/2),1,0)	0	=IF(B20=E20,1,0)

Table III Decision Rule Formulas (continued)

	S	Formulas for S
5	Forward	
6	3 day	
7	Moving	
8	Average	
9	64.247	=AVERAGE(E9:E11)
10	64.287	=AVERAGE(E10:E12)
11	64.163	=AVERAGE(E11:E13)
12	63.790	=AVERAGE(E12:E14)
13	63.333	=AVERAGE(E13:E15)
14	62.500	=AVERAGE(E14:E16)
15	62.333	=AVERAGE(E15:E17)
16	63.790	=AVERAGE(E16:E18)
17	65.873	=AVERAGE(E17:E19)
18	68.040	=AVERAGE(E18:E20)
19	68.707	=AVERAGE(E19:E21)
20	68.123	=AVERAGE(E20:E22)

Table III Decision Rule Formulas (continued)

	T	Formulas for T
1	Uptrends	
2	802	=SUM(T9:T3831)
5	Ex	
6	Ante	
7	Up	
8	Trends	
9		
15	0	=IF(OR(AND(S21>S20,S20>S19,S19>S18,S18>S17,S17>S16,S16>S15), AND(S21>S20,S20<S19,S19>S18,S18>S17,S17>S16,S16>S15), AND(S21>S20,S20>S19,S19<S18,S18>S17,S17>S16,S16>S15), AND(S21>S20,S20>S19,S19>S18,S18<S17,S17>S16,S16>S15), AND(S21>S20,S20>S19,S19>S18,S18>S17,S17<S16,S16>S15), AND(S21>S20,S20>S19,S19>S18,S18>S17,S17>S16,S16<S15)),1, IF(AND(S21<S20,S20>S19,S19>S18,S18>S17,S17>S16,S16>S15),1,0))
16	0	=IF(OR(AND(S22>S21,S21>S20,S20>S19,S19>S18,S18>S17,S17>S16), AND(S22>S21,S21<S20,S20>S19,S19>S18,S18>S17,S17>S16), AND(S22>S21,S21>S20,S20<S19,S19>S18,S18>S17,S17>S16), AND(S22>S21,S21>S20,S20>S19,S19<S18,S18>S17,S17>S16), AND(S22>S21,S21>S20,S20>S19,S19>S18,S18<S17,S17>S16), AND(S22>S21,S21>S20,S20>S19,S19>S18,S18>S17,S17<S16)),1, IF(AND(S22<S21,S21>S20,S20>S19,S19>S18,S18>S17,S17>S16),1,0))
17	0	=IF(OR(AND(S23>S22,S22>S21,S21>S20,S20>S19,S19>S18,S18>S17), AND(S23>S22,S22<S21,S21>S20,S20>S19,S19>S18,S18>S17), AND(S23>S22,S22>S21,S21<S20,S20>S19,S19>S18,S18>S17), AND(S23>S22,S22>S21,S21>S20,S20<S19,S19>S18,S18>S17), AND(S23>S22,S22>S21,S21>S20,S20>S19,S19<S18,S18>S17), AND(S23>S22,S22>S21,S21>S20,S20>S19,S19>S18,S18<S17)),1, IF(AND(S23<S22,S22>S21,S21>S20,S20>S19,S19>S18,S18>S17),1,0))
18	0	=IF(OR(AND(S24>S23,S23>S22,S22>S21,S21>S20,S20>S19,S19>S18), AND(S24>S23,S23<S22,S22>S21,S21>S20,S20>S19,S19>S18), AND(S24>S23,S23>S22,S22<S21,S21>S20,S20>S19,S19>S18), AND(S24>S23,S23>S22,S22>S21,S21<S20,S20>S19,S19>S18), AND(S24>S23,S23>S22,S22>S21,S21>S20,S20<S19,S19>S18), AND(S24>S23,S23>S22,S22>S21,S21>S20,S20>S19,S19<S18)),1, IF(AND(S24<S23,S23>S22,S22>S21,S21>S20,S20>S19,S19>S18),1,0))

Table III Decision Rule Formulas (continued)

	U	Formulas for U
1	Downtrends	
2	751	=SUM(U9:U3831)
5	Ex	
6	Ante	
7	Down	
8	Trends	
9		
15	0	=IF(OR(AND(S21<S20,S20<S19,S19<S18,S18<S17,S17<S16,S16<S15), AND(S21<S20,S20>S19,S19<S18,S18<S17,S17<S16,S16<S15), AND(S21<S20,S20<S19,S19>S18,S18<S17,S17<S16,S16<S15), AND(S21<S20,S20<S19,S19<S18,S18>S17,S17<S16,S16<S15), AND(S21<S20,S20<S19,S19<S18,S18<S17,S17>S16,S16<S15), AND(S21<S20,S20<S19,S19<S18,S18<S17,S17<S16,S16>S15)),1, IF(AND(S21>S20,S20<S19,S19<S18,S18<S17,S17<S16,S16<S15),1,0))
16	0	=IF(OR(AND(S22<S21,S21<S20,S20<S19,S19<S18,S18<S17,S17<S16), AND(S22<S21,S21>S20,S20<S19,S19<S18,S18<S17,S17<S16), AND(S22<S21,S21<S20,S20>S19,S19<S18,S18<S17,S17<S16), AND(S22<S21,S21<S20,S20<S19,S19>S18,S18<S17,S17<S16), AND(S22<S21,S21<S20,S20<S19,S19<S18,S18>S17,S17<S16), AND(S22<S21,S21<S20,S20<S19,S19<S18,S18<S17,S17>S16)),1, IF(AND(S22>S21,S21<S20,S20<S19,S19<S18,S18<S17,S17<S16),1,0))
17	0	=IF(OR(AND(S23<S22,S22<S21,S21<S20,S20<S19,S19<S18,S18<S17), AND(S23<S22,S22>S21,S21<S20,S20<S19,S19<S18,S18<S17), AND(S23<S22,S22<S21,S21>S20,S20<S19,S19<S18,S18<S17), AND(S23<S22,S22<S21,S21<S20,S20>S19,S19<S18,S18<S17), AND(S23<S22,S22<S21,S21<S20,S20<S19,S19>S18,S18<S17), AND(S23<S22,S22<S21,S21<S20,S20<S19,S19<S18,S18>S17)),1, IF(AND(S23>S22,S22<S21,S21<S20,S20<S19,S19<S18,S18<S17),1,0))
18	0	=IF(OR(AND(S24<S23,S23<S22,S22<S21,S21<S20,S20<S19,S19<S18), AND(S24<S23,S23>S22,S22<S21,S21<S20,S20<S19,S19<S18), AND(S24<S23,S23<S22,S22>S21,S21<S20,S20<S19,S19<S18), AND(S24<S23,S23<S22,S22<S21,S21>S20,S20<S19,S19<S18), AND(S24<S23,S23<S22,S22<S21,S21<S20,S20>S19,S19<S18), AND(S24<S23,S23<S22,S22<S21,S21<S20,S20<S19,S19>S18)),1, IF(AND(S24>S23,S23<S22,S22<S21,S21<S20,S20<S19,S19<S18),1,0))

Table III Decision Rule Formulas (continued)

	V	Formulas for V
1		
2	35	=SUM(V9:V3831)
5	Accurate	
6	Forecast	
7	Of	
8	Uptrend	
9		
15		
16		
17	0	=IF(OR(J19=1,K19=1,L19=1,M19=1),IF(OR(T20=1,T21=1,T22=1, T23=1,T24=1,T25=1,T26=1),1,0),0)
18	0	=IF(OR(J20=1,K20=1,L20=1,M20=1),IF(OR(T21=1,T22=1,T23=1, T24=1,T25=1,T26=1,T27=1),1,0),0)

	W	Formulas for W
1		
2	72	=SUM(W9:W3831)
5	Accurate	
6	Forecast	
7	of	
8	Downtrend	
9		
15		
16		
17	0	=IF(OR(N19=1,O19=1,P19=1,Q19=1,R19=1),IF(OR(U20=1,U21=1, U22=1,U23=1,U24=1,U25=1,U26=1),1,0),0)
18	0	=IF(OR(N20=1,O20=1,P20=1,Q20=1,R20=1),IF(OR(U21=1,U22=1, U23=1,U24=1,U25=1,U26=1,U27=1),1,0),0)

Table III Decision Rule Formulas (continued)

	X	Formulas for X
1		
2	25	=SUM(X9:X3831)
4	Bull	
5	Signal	
6	w/Down	
7	Trend	
8	Following	
15		
16		
17	0	=IF(OR(J19=1,K19=1,L19=1,M19=1),IF(OR(U20=1,U21=1,U22=1, U23=1,U24=1,U25=1,U26=1),1,0),0)
18	0	=IF(OR(J20=1,K20=1,L20=1,M20=1),IF(OR(U21=1,U22=1,U23=1, U24=1,U25=1,U26=1,U27=1),1,0),0)

Table III Decision Rule Formulas (continued)

	Y	Formulas for Y
1		
2	70	=SUM(Y9:Y3831)
4	Bear	
5	Signal	
6	w/Up	
7	Trend	
8	Following	
15		
16		
17	0	=IF(OR(N19=1,O19=1,P19=1,Q19=1,R19=1),IF(OR(T20=1,T21=1,T22=1 ,T23=1,T24=1,T25=1,T26=1),1,0),0)
18	0	=IF(OR(N20=1,O20=1,P20=1,Q20=1,R20=1),IF(OR(T21=1,T22=1,T23=1, T24=1,T25=1,T26=1,T27=1),1,0),0)

Table IV Summary of True vs False Signals

Panel A Illustration of True vs Negative signals

	Actual Market Movements		
Model Predictions	Uptrend	Downtrend	No Change
Uptrend	**TP**	FP	FP
Downtrend	FP	**TP**	FP
No Change	FN	FN	**TN**

TP= true positive FP= false positive TN= true negative FN= false negative

Panel B Actual Sample Results

	Actual Market Movements		
Model Predictions	Uptrend	Downtrend	No Change
Uptrend	**35 (3%)**	25 (3%)	FP
Downtrend	70 (9%)	**72 (10%)**	FP
No Change	697 (87%)	654 (87%)	**TN**
Totals	**802 (100%)**	**751 (100%)**	

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Restructuring Household Finances to Prepare for Home Ownership: A Class Exercise

Walt A. Nelson and James R. Scott

Abstract

The purpose of this paper is to demonstrate an interactive pedagogical case study in which college students are required to examine their potential for home ownership after graduation given their own current and anticipated household financial condition. In Part One of this paper, the basic requirements and nomenclature of the home loan process are presented. Part Two shows how lenders typically employ the front ratio and back ratio as part of the loan approval process. Part Three expands the analysis by presenting a planning worksheet example and survey by which college students may apply these principles to their own household finances in order to prepare for eventual home ownership. The form is designed to be a data collection device. Part Four concludes with suggestions for future research.

I. The Home Loan Application Process

Home ownership is still perceived generally as a major accomplishment for most Americans. This case study assumes that most college students share the ambition to one day purchase a home. So, the first part of this interactive case study introduces the college student to the home loan application process.

Loan underwriting is the core of the mortgage approval process. The loan application approval rests upon two primary factors: (1) the credit standing of the borrower and (2) the value of the home. The issue of credit worthiness is the most important factor bearing on the lender's decision to make a home loan for a prospective borrower who will occupy the property as his or her personal residence. The reason that credit worthiness is so important is that, should the lender have to foreclose, the home produces no income (the lenders primary goal in the loan process). Therefore, the lender is most interested in making a determination of the borrower's ability and willingness to pay. Since the appraisal process is not a part of this paper, we will assume in each of the following examples that the home in question has "appraised up." Of course, the appraised value of the home must be greater than or equal to the proposed sale price and more than the loan amount in a typical (non-sub-prime) loan arrangement.

The borrower's credit score is used by the loan underwriter to estimate the borrower's willingness and/or ability to pay. That is, in the view of the underwriter, past history is a fair predictor of future performance. The Fair Isaacs Company has captured a large portion of the credit score market with its proprietary formulas which produce a unique credit score for each individual. High scores are usually considered to be above 700 and low scores below 600. Such scores are available, for a fee, from the website http://www.myfico.com/. Free credit scores often available on the internet are usually a vendor simulation of the Fair Isaacs score. These scores are free to the consumer and can be useful in the analysis. Information is available at http://www.ftc.gov/freereports . Credit scores include the impact of the individual's past use or abuse of credit. The score is obtained by comparing the number of credit accounts, the related balances and monthly payments, delinquencies, defaults and bankruptcies.

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To determine the borrower's ability to pay, lenders look at income, wealth, and financial obligations. Monthly household income is determined on a before-tax basis. This figure includes pay from employment, public support, retirement benefits and even alimony and child support. Lenders are prohibited by law from penalizing the borrower for reporting income from alimony, child support or public assistance. Therefore, the loan underwriter will base the loan decision, at least in part, upon the stability of the household income. Underwriting standards typically require that borrower's who apply for the most favorable credit terms be able to show they have worked in the same firm, or sometimes in the same field, for at least two years.

II. Using the Front Ratio and the Back Ratio

One traditional rule used by lenders, builders and real estate agents to estimate the price of a home the buyer could afford was the "Two-and-a-half Times Rule." Suppose a buyer reported annual household income of $46,000. He or she could afford a home priced at $115,000: $115,000 = $46,000 x 2.5. This rule has been in use for many decades.

Starting in the 1980s, lenders began to employ two rules, both using several variables, the most important of which was the buyer's monthly gross income. The front ratio, or "front end ratio" stipulates that no more than 28% of the borrower's monthly gross income can be devoted to the payment for the home mortgage. Included in this payment are principal, interest, escrows for property taxes and hazard insurance and payment for any required private mortgage insurance (Dasso, et al, 1995; McWhinney, 2005). The model is self calibrating because it adjusts for the buyer's down payment to estimate the maximum affordable home price:

$$MXP_f = MGI(f)/(LTV(k) + TXI/12 + PMI/12) \quad [1]$$

Where:
MXP_f = the maximum affordable home price using the front ratio
MGI = monthly gross income reported by the borrower household
f = front ratio of 28%, stipulated as .28
LTV = loan-to-value ratio
k = monthly mortgage loan constant (the rate factor based on fixed loan terms)
TXI = annual estimate property taxes and hazard insurance, expressed as a percentage of MXP_f
PMI = annual payment for private mortgage insurance

Suppose, for example, that two years after graduating, Mr. and Mrs. Jay report a gross household income of $96,000 per year, which works out to $8,000 per month. Interest rates are at 6.5% for a 30 year fixed rate mortgage (constant = .006321), lenders require a down payment of 5%, PMI costs .78% of the OLB (Original Loan Balance) and insurance and taxes amount to 3.2% of the home value annually(divide by 12 for monthly payment). The front ratio method indicates that the couple can afford a home priced at around $240,300:

$$\begin{aligned} MXP_f &= \$8,000(.28)/[(.95 \times .006321) + .032/12 + .0078/12] \\ &= \$2,240/(.006005 + .002667 + .00065) \\ &= \$2,240/.009321 \\ &= \$240,309 \end{aligned}$$

The example indicates that PITI (Principal, Interest, Taxes, and Insurance) plus PMI does not exceed $2,240 per month, which is 28% of $8,000, the gross monthly household income reported by the couple.

OLB $228,293 = .95 x $240,309
PMT $1,443.04 = $228,293 x .006321
TXI $640.82 = ($240,309 x .032)/12
PMI $148.39 = ($228,293 x .0078)/12
Result ($1,443.04 + $640.82 + $148.39) $\leq$ $2,240

The back ratio restricts total monthly debt service to all creditors to a maximum of 36% of household monthly gross income net of other debt obligations. Although the numerator of this model is different from that used in the front ratio, previously shown, the denominator for both models is the same:

$$MXP_b = [MGI(b) - ODO]/(LTV(k) + TXI/12 + PMI/12) \quad [2]$$

Where:
MXP_b= the maximum affordable home price using the back ratio
MGI = monthly gross income reported by the borrower household
b = back ratio of 36%, stipulated as .36
ODO = other debt obligations per month apart from PITI and PMI
LTV = loan-to-value ratio
k = monthly mortgage loan constant
TXI = annual estimate property taxes and hazard insurance, expressed as a percentage of MXP_b
PMI = annual payment for private mortgage insurance

Suppose now the same couple has combined college loan debt of $50,000 paid on a twenty year monthly plan at 5% (pmt = $329.97), two car payments of $350 per month each, and total credit card payments of $175 per month. Using the same information as before, but employing a back ratio of 36%, the couple can afford a home priced just under $180,000:

= [($8,000 x .36) - $329 - $700 - $175]/[(.95 x .006321) + .032/12 +.0078/12]
= [($2,880) - $1,204]/.009321
= $1,676/.009321
= $179,809

The figure $2,880 is the maximum total debt obligations, TDO, which can be supported by household income using the back ratio of 36%. Subtracting other debt obligations, ODO, from TDO, results in the maximum PITI plus PMI which is supportable by household income. Since, $1,676 = $2,880 - $1,204, then this couple can afford a house payment, which includes PITI and PMI, of not more than $1,676 per month. The proof, shown below, indicates that total debt obligations (TDO) do not exceed $2,880 per month. The back ratio is more complicated than the front ratio, so the example becomes more complex:

OLB	= $179,809 x .95	= $170,818
PMT	= $178,818 x .006321	= $1,079.74
TXI	= (.032 x $179,809)/12	= $479.49
PMI	= (.0078 x $178,818)/12	= $116.23
TDO	= ($1,079.74 +$479.49 + $116.23) + $1,204	= $2,879.46

When presented in class, the example above introduces students to time value of money, the structure of mortgage loans, as well as the costs of property taxes, hazard insurance and private mortgage insurance. Requirements concerning the loan-to-value ratio and equity down payment are also presented. The instructor may use various combinations of formula, spreadsheet, tables and financial calculator keystrokes to guide the students through the ratios and their proofs. The impact of the interest rate, the term of the loan and additional debt burden can also become major educational tools.

III. Survey of Household Finances

In the example above, using the back ratio to incorporate the impact of other monthly installment debt diminishes the maximum affordable home price by nearly 25%:[1.0 – ($179,809/$240,309)]. This impact is especially significant for the college student, because a major component of other monthly installment debt is the payment required to retire student loan debt. While academic research has not yet examined the relationship between home-loan default and student loan debt (LaCour-Little, 2008), the market place has taken notice of this issue. The Mortgage Bankers Association now co-sponsors a website, www.studentloanrx.com, which is designed to help students manage their finances (Purisky, 2005). The survey which appears below allows the college student to examine his or her household finances to prepare for home ownership. The assumptions built into the calculations on the survey are explained in the paragraph which appears just under the title.

To qualify for a home loan with the most favorable terms, first-time borrowers are typically required to show at least two years of steady work. During this two year period, the household will likely be renting. The result of this survey of household finances is actually the maximum monthly rent the student should pay for an apartment during the first two years after college or before the home purchase qualification. By working through the calculations in the form, the student can determine immediately, what impact his other debt obligations are likely to have on his ability to rent suitable lodgings and subsequently purchase a home.

For illustrative purposes, the survey presented in Exhibit I is completed using information drawn from the example presented above. The back ratio method is shown, but the front ratio method is easily adapted to provide a survey to determine potential home purchase price for borrowers that have budgeted for a low or zero debt entry in the home market.

IV. Collecting the Data for Future Research

A blank "Survey of Household Finances" appears as Exhibit II at the end of this paper. It is provided to the academic community as a training device for the classroom and as a means of collecting data for future research. Notice that the blank form includes two pieces of

demographic information: the age of the college student and the marital status, both projected as of the future graduation date. Other demographics could be added.

What do we want to know? First, we want to examine the average amount reported on Line J, which represents the projected maximum rent the graduate should expect to pay and still conform to lender standards to eventually qualify for a home loan. If Line J, on average, is very small, say a few hundred dollars, this would seem to indicate that students are quite over-burdened with debt by the time they graduate from college. Second, we would like to assemble a prescriptive financial model which, when used by college counselors or posted on the web, would indicate to the college student just how much student loan and college related debt he or she should expect to sustain and still qualify to buy a home perhaps as soon as two years after having graduated. Although it is true that about 68% of households in the U.S. own their home, the rate for households whose head is aged less than 35 is only about 40% (Vlasenko, 2008).

There is a conflict between paying for college and paying for a home. On one hand students seek a college degree to pursue the American Dream: a career and perhaps a home and a family. On the other hand, having obtained the college degree, at least a portion of college graduates cannot afford a home because the monthly payment to retire student loans stands in the way. For those households attempting simultaneously to pay for a home and payoff student loan debt the default potential is significant. In fact, default rates for student loans are similar to the default rates reported for subprime home loans (Herr and Burt, 2005; Kesterman, 2006).

EXHIBIT I. EXAMPLE USING THE SURVEY OF HOUSEHOLD FINANCES

The purpose of this survey is to direct the respondent's attention to a future time when he or she may wish to purchase a home. It is often necessary to properly structure household finances several years in advance of such a purchase. Structuring household finances in ways suggested by this form will never guarantee that the respondent will actually qualify for a home loan. This survey ignores the impact of credit scores and closing costs.

Here are the assumptions upon which this survey is based. All household income and debt information supplied by the respondent is assumed to be correct or correctable by the respondent. The survey ignores the impact of the income tax deductibility for mortgage interest, PMI and property taxes. The monthly savings set aside to accumulate a down payment is assumed to earn no interest during the two year period when the household is renting. The factor found in the column below, .009321, is based on the assumptions that 30-year fixed rate loans are available at 6.5% per year (constant = .006321), lenders require a down payment of 5%, PMI costs .78% of the OLB and property taxes and insurance amount to 3.2% of the home value annually. Annual estimates of PMI and TXI are adjusted to obtain their monthly equivalents. So, .009321 = (.95 x .006321) + .032/12 +.0078/12.

Expected MONTHLY gross household income after graduation:	$	8,000	A
Multiply by the back ratio		.36	
Enter result. This is the maximum total debt obligation	$	2,880	B
Other monthly debt obligations expected (student loan, car, etc) after graduation:	-	1,204	C
Subtract and enter result here. This is the maximum PITI + PMI	$	1,676	D
Divide by factor	÷	.009321	

Result is MXP_b the maximum home price using the back ratio	$	179,809	E
Multiply by .05		.05	
Down payment required to buy the home	$	8,990	F
Divide by 24 months	÷	24	
Monthly amount to save for down payment	$	375	G
Enter the maximum total debt obligations from Line B, above	$	2,880	B
Enter the monthly amount to save for down payment from Line G, above	-	375	G
Subtract Line G from Line B	$	2,505	H
Enter other monthly debt obligations from line C, above	-	1,204	C
Subtract Line C from Line H. Enter the result	$	1,301	J

Line H is the maximum monthly obligation, net of down payment savings, the household can sustain in order to structure finances to prepare for the future home purchase and qualify for the related home loan using the back ratio of .36.

Line J is the maximum monthly rent the household can sustain during the two years of renting, working and saving for the future home purchase. Note: Consideration of personal income and other taxes should be made as well to properly plan the future purchase.

EXHIBIT II. SURVEY OF HOUSEHOLD FINANCES (BLANK)

The purpose of this survey is to direct the respondent's attention to a future time when he or she may wish to purchase a home. It is often necessary to properly structure household finances several years in advance of such a purchase. Structuring household finances in ways suggested by this form will never guarantee that the respondent will actually qualify for a home loan. This survey ignores the impact of credit scores and closing costs.

Here are the assumptions upon which this survey is based. All household income and debt information supplied by the respondent is assumed to be correct or correctable by the respondent. The survey ignores the impact of the income tax deductibility for mortgage interest, PMI and property taxes. The monthly savings set aside to accumulate a down payment is assumed to earn no interest during the two year period when the household is renting. The factor found in the column below, .009321, is based on the assumptions that 30-year fixed rate loans are available at 6.5% per year (constant = .006321), lenders require a down payment of 5%, PMI costs .78% of the OLB and property taxes and insurance amount to 3.2% of the home value annually. Annual estimates of PMI and TXI are adjusted to obtain their monthly equivalents. So, .009321 = (.95 x .006321) + .032/12 +.0078/12.

Age of respondent upon graduation from college: _____ years
Upon graduation I will be: Married_____ Single _____

Expected MONTHLY gross household income after graduation:	$		A
Multiply by the back ratio		.36	
Enter result. This is the maximum total debt obligation	$		B
Other monthly debt obligations expected (student loan, car, etc) after graduation:		_____	C
Subtract and enter result here. This is the maximum PITI + PMI	$		D
Divide by factor	÷	.009321	

Result is MXP_b the maximum home price using the back ratio	$	E
Multiply by .05	.05	
Down payment required to buy the home	$	F
Divide by 24 months	÷ 24	
Monthly amount to save for down payment	$	G
Enter the maximum total debt obligation from Line B, above	$	B
Enter the monthly amount to save for down payment from Line G, above		G
Subtract Line G from Line B	$	H
Enter other monthly debt obligations from line C, above		C
Subtract Line C from Line H. Enter the result	$	J

Line H is the maximum monthly obligation, net of down payment savings, the household can sustain in order to structure finances to prepare for the future home purchase and qualify for the related home loan using the back ratio of .36.

Line J is the maximum monthly rent the household can sustain during the two years of renting, working and saving for the future home purchase. Note: Consideration of personal income and other taxes should be made as well to properly plan the future purchase.

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Benjamin Graham Revisited

Robert Balik and Jamshid Mehran

I. Introduction

Warren Buffett read the first edition of Benjamin Graham's book, *The Intelligent Investor*, in 1950. According to Buffett (Graham, Revised, 2003) "I thought then that it was by far the best book about investing ever written. I still think it is."

Can a buy and hold defensive investor use this stock selection criteria and earn a positive abnormal risk adjusted rate of return? To test this hypothesis data for 2000 and prior years are used to select stocks that meet the defensive investor criteria. Nine stocks from an original list of more than 9,000 satisfy the criteria. Buy and hold is the investment strategy and these stocks are held from the end of June 2001 until the end of December 2007. The performance measure is the time-series regression intercept, or alpha, for the four-factor model. The estimated alpha is negative but not statistically significant.

II. Literature Review

A study by Oppenheimer and Schlarbaum (1981) is the only study that we could find that is similar to our study. They used the following criteria to select stocks: 1) $50 million in assets or annual sales and be in upper ¼ to 1/3 of its industry in size; 2) Equity (at book value) at least 50 percent of total capitalization for industrial companies; at least 30 percent of total capitalization for utilities; 3) Stock price not to exceed 25 times average earnings of past seven years and not to exceed 20 times earnings of latest twelve month period. The study covered the time period from the end of December 1955 through December 1975 and the portfolio of stocks was revised each year. Jensen's alpha was the performance measure. The alpha values reported are positive but no measures of statistical significance such as p-values or t-values are reported.

Graham's Defensive Investment Criteria

Graham discussed seven historic investment criteria. They vary from a minimum size criteria to a price to assets ratio criteria.

The first is an adequate size of the enterprise: According to Graham the size of the firm is an indirect measure of safety. A smaller company is generally subject to wider fluctuations in earnings. In 1970 Graham recommended that an industrial company should have at least $100 million of annual sales, and a public utility company should have no less than $50 million in total assets. Adjusted for inflation, the numbers in 2000 would work out to approximately $465 million and $232 million respectively. Financial firms are not considered.

The next is a sufficiently strong financial condition. A stock should have a current ratio of at least two and long-term debt should not exceed working capital. For utilities, the debt should not

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exceed twice the stock equity at book value. This should act as a strong buffer against the possibility of bankruptcy or default.

Then is an earnings stability criteria. The company should not have reported a loss over the past 10 years. Companies that maintain at least some level of earnings are, on the whole, more stable.

There is a dividend record criteria. Company should have a history of paying dividends on its common stock for at least the past 20 years. This should provide some assurance that future dividends are likely to be paid.

Related to the dividend criteria is an earnings growth criteria. To help ensure a company's profits keep pace with inflation, net income should have increased by one-third or greater on a per-share basis over course of the past 10 years using three-year averages at the beginning and end.

There is also a price to earnings ratio criteria. For inclusion into a conservative buy and hold portfolio, the current price of a stock should not exceed fifteen times its average earnings for the past three years. This acts as a safeguard against overpaying for a security.

The last criteria is the Ratio of Price to Assets. According to this criteria current price should not be more than 1 1/2 times the book value last reported. However, a multiplier of earnings below 15 could justify a correspondingly higher multiplier of assets. As a rule of thumb the product of the multiplier times the ratio of price to book value should not exceed 22.5 (this corresponds to 15 times earnings and 1 1/2 times book value. It would admit an issue selling at only 9 times earnings and 2.5 times asset value, etc.)

III. Data and Performance Measure

The information used to select the firms that satisfy the above criteria was from Standard & Poor's Compustat. This data is for 2000 and earlier years. The monthly closing stock prices for the selected firms, which are used to calculate monthly portfolio rates of return, are from the end of June 2001 through the end of December 2007 and are from Yahoo Finance. These stock prices are adjusted for cash dividends and stock splits. The non-stock performance measurement data, such as the risk free rate and market rate of return, is from the Kenneth French's web site (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). The market proxy is the monthly rate of return on the value weighted CRSP (Center for Returns in Security Prices) with dividends.

The four-factor regression model (Fama and French, 1993, and Carhart, 1997) is used to measure performance. The mathematical form is

$$R_t - RF_t = \alpha + \beta_1 * RMRF_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * Momentum_t + \varepsilon_t$$

where

R_t is the rate of return in month t on the Graham portfolio,

RF_t is the rate of return in month t for the risk free proxy,

$RMRF_t$ is the rate of return in month t for value-weighted market index minus the risk-free proxy,

SMB_t is the small minus big proxy (size effect),

HML_t is the high minus low proxy (book-to-market effect), and

$Momentum_t$ is the momentum proxy.

The dependent variable is monthly rate return for the selected stock portfolio minus the monthly risk free rate. The four independent variables are:

1. Excess return on the value weighted market portfolio (Rate of Return on the value weighted CRSP index with dividends minus the risk free proxy);
2. Difference between the returns of value weighted portfolios of small and big firm stocks;
3. Difference in returns of value weighted portfolios of high and low book-to-market stocks; and
4. Difference in returns of stocks with high past returns minus those with low past returns (Momentum).

The estimated y-intercept or alpha is interpreted as the mean monthly abnormal return.

IV. Results

Table 1 contains the names of the nine firms that meet Graham's investment criteria.

Table 1: Nine firms in Graham's Portfolio	
1	AAR Corp
2	Avnet
3	Circuit City Stores
4	Haverty Furniture
5	La-Z-Boy
6	Nucor
7	Oxford Industries
8	Watsco
9	Werner Enterprises

The portfolio starts with an equal investment in each security and presumes a buy and hold strategy. That is, there is no monthly portfolio re-balancing.

Figure 1 shows the value a $10,000 investment in the Graham portfolio and the Standard and Poor's 500 index (including dividend re-investment). The Graham portfolio grows from $10,00 to $19,679 (from the end of June 2001 to the end of December 2007) whereas the Standard & Poor's 500 index goes from $10,000 to $13,453.

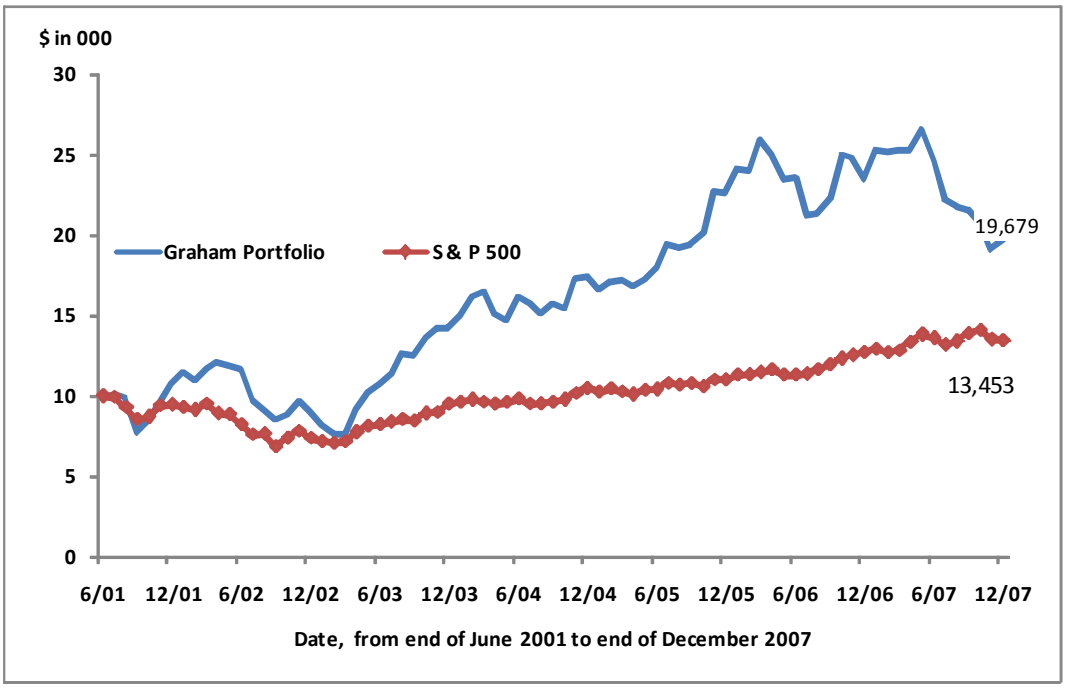
The four-factor model's estimated intercept (alpha) is -0.061% per month, which is equivalent to -0.735 percent per year. The negative value is not statistically significant. The one tail t statistic for the null hypothesis that the population intercept or alpha is greater than zero is --0.84.

Additionally, the r-square for the regression of the 36 monthly rates of return for the nine stock portfolio for three years prior to 2001 against the corresponding monthly rates of return on the Standard and Poor's 500 index was 0.55. This indicates that the nine stock portfolio was not fully diversified.

V. Summary

The buy and hold portfolio selected using Graham's defensive investor criteria held only nine stocks. Using the four-factor model the calculated alpha for this portfolio was negative but not statistically significant. These results imply that information such as Graham's defensive investment criteria are reflected in the current price of a stock. As a results, abnormal rates of return would occur only randomly.

Figure 1: Value of $10,000 investment in Graham Portfolio and S&P 500 Index



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Board Independence and Firm Performance:
Case of Small-Cap Firms

Sharon K. Lee

Abstract

Many changes in the size and composition of corporate boards of directors have occurred since the enactment of the 2002 Sarbanes-Oxley Act (SOX). With the new regulations, we have seen an increase in the number of independent board members and a decrease in the average size of boards. A recent study of S & P 500 firms [Lee, Carlson, 2007] shows that firms with the most independent boards perform significantly better than firms with less independent boards. Studies before the enactment of SOX found a significant inverse relationship between board size and firm performance. However, this relationship is not found in this study. In smaller firms, the goals of management and shareholders may be more aligned than that in larger firms such as the S & P 500. It is possible that the objective monitoring from a more independent board is not a significant factor in the performance of smaller firms. This study includes small-cap firms and examines the relationship between board independence and firm performance in small-cap firms.

I. Introduction

The Sarbanes-Oxley Act of 2002, the SEC, NYSE, NASDAQ, and AMEX have created more rules and guidelines in an attempt to restore investor confidence in that monitoring body, the corporate board of directors. Several regulations are still pending but corporations have scrambled to comply with relatively new rules and guidelines. In order to rebuild investor confidence, one focus of study is board independence. The directors on the board are responsible for ensuring that management acts in the best interests of the shareholders. Many corporations have made board changes to increase the independence of their board composition. Sixty-four percent of Standard & Poor's Super 1,500 companies currently "have boards that are at least 2/3 independent, as compared with only 57% of that group just last year" [IRRC, 2003, p.14].

Independent directors may be more likely to monitor management more effectively by challenging management if it appears that firm valuation is not being maximized. The presence of outside or independent directors may decrease agency costs experienced by most firms, and should increase the overall performance and value of the firm. Objective decisions made by monitoring directors not connected to the firm may prevent the entrenchment of management. Management that believe they are secure in their jobs, no matter their performance, may be more likely to make decisions that do not maximize the value of the firm. Individuals affiliated with the corporation may make decisions that promote their own best interests rather than shareholder wealth. The Sarbanes-Oxley Act of 2002 has specifically addressed the independence of audit committees, and under the pending governance changes at the NYSE, NASDAQ, and AMEX, boards are to have at least a majority of independent directors. In addition, these regulations may require total independence of audit, compensation and nominating committees.

Several studies have addressed the question of outside directors and their effect on firm performance, but the findings are mixed [Hermalin and Weisbach (1991), (2002)]. Dahya and

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McConnell (2002) study firms that recently increased their board's independence and find that hose boards are significantly more likely to replace the CEO after a record of poor firm performance.

The level of independence has increased, with the IRRC reporting the independence level of directors at about 67 % in 1999 rising to 72% in 2003 for S & P 500 firms. In an examination of S & P 500 firms, Lee and Carlson (2007) find that firms with the most independent boards perform better than those firms with less independent boards. Specifically, S & P 500 firms that had a minimum of 75% independence on the board of directors performed significantly better than those firms with less independence in the same time period. This provides support for the benefits to shareholders of having more independent directors on the board. The monitoring of board members, unattached financially and/or emotionally to the firm may be more effective. In smaller firms there are lower agency costs since the goals of management may be more closely aligned with those of the shareholders. In many cases, the management of small-cap firms have significant shareholdings in the firm and therefore have a vested interest in the performance and value of the firm. Given that, the positive relationship found between the level of board independence and firm performance may not be found in smaller firms where more effective monitoring may not be needed. This study will help answer the question whether or not strict regulations about board independence are needed in the case of smaller firms.

The size of boards and its possible effect on firm performance is examined in this study. It appears that the recent changes in composition of boards of large firms have brought about a decrease in the average size of the boards in large companies as those included in the S & P 500. In order to be in compliance with the new regulations pertaining to independence levels, many directors that would be considered an affiliated, or nonindependent member have stepped down. In addition, the perceived risk and responsibilities of serving on a corporate board (post-Enron) may have contributed to the decrease. The average size of S & P 500 firms as of the end of 2003 was eleven members, down from twelve members just two years earlier. *However, the boards of small-cap firms have maintained an average of eight members* [IRRC, 2004]. Does this imply that a "weeding out" of certain directors on the board of smaller firms is not needed?

Several studies have examined the relationship between the size of the board of directors, and firm value and performance [Bhagat and Black (1996; Yermack (1996); Eisenberg et al. (1998)]. Is board size an important determinant of the board's quality of monitoring and decision-making? If so, what is the effect of these inefficiencies on the profitability and value of the firm? Yermack (1996) and Eisenberg et al.(1998) both conclude that there exists an inverse relationship between board size and firm value. In a discussion on corporate governance, Lipton and Lorsch (1992) state that larger groups or boards are less efficient, where individuals are apt to be less open in corporate policy discussions. People tend to be more reserved and polite in larger groups. This type of behavior by board members reduces the effectiveness of their monitoring role of management. Jensen (1993) agrees with this point, "when boards get beyond seven or eight people they are less likely to function effectively and are easier for the CEO to control." As pointed out by Monks and Minow (1995), in many corporate restructurings (after successful tender offers), the boards of directors were reduced in number.

This study examines small-cap firms included in Standard & Poor's Super 1,500 in an attempt to answer the following two questions: 1) Do smaller firms benefit from more

independent boards by performing better than firms with less independent boards? and, 2) Do small firms with larger boards possess inefficiencies and less effective monitoring skills resulting in worse firm performance than corporation with smaller size boards?

II. Data

Board characteristics and firm performance of small-cap firms included in the S & P Super 1,500 companies as of the end of their respective fiscal 2003 year are examined. This study includes 495 small-cap firms and for each firm, data on board size, independence percentages of the board, total assets, total revenue, return on assets (ROA) measures, industry average return on assets measures, and insider stock ownership percentages for each firm are collected. Incomplete data reduced the sample of small-cap firms to 486 firms.

Firm ROA, industry ROA, total assets, and total revenue measures are collected from the *Compustat* tapes. Board sizes and insider holdings percentages are identified from the IRRC *Board Practices 2004 Edition,* and later confirmed in the firm's 10K report on the SEC Edgar Database. An industry-adjusted return on assets (ROA), as used by Eisenberg, Sundgren, and Wells 1999, is used as a firm performance measure for the fiscal period ending in 2003. Specifically, [Firm ROA – Industry Average ROA] is used as a relative firm performance measure, and will be referred to as an industry-adjusted ROA in this study.

In Table I the sample of small-cap firms is listed by industry, including the mean level of board independence and the mean number of directors on the board. The top four industries listed, comprising over 30% of the small-cap sample, have companies in the business services, commercial bank, broadcasting, and industrial measurement instruments industry. The mean level of independence on the board for the smaller firms is about 66%. This is significantly lower than the 72% mean level of independence for S & P 500 firms, as reported in an earlier study (Lee and Carlson, 2007). In addition, the mean number of board members is only eight (8) members for the smaller firms, as compared to eleven (11) for S & P 500 firms (Lee and Carlson, 2007).

III. Methodology

Tables II shows descriptive data on the small-cap firms, reporting mean values for the collected variables per deciles of independence. For example, in the sample, there are ten (10) firms with board independence of 90% or more; 103 firms with board independence of greater or equal to 80% but less than 90%. The mean variables listed include total assets, ROA, an "industry-adjusted" ROA, board size, and insider holdings percentages

The data is analyzed using several approaches to determine any relationships between board independence, board size, and firm performance. To test for significant differences in variable means between the most and least independence levels on boards, analysis of variance (ANOVA) tests are performed. As shown in Table II, the firms are divided into deciles by level of independence of the board of directors. The industry-adjusted ROA is tested to determine if it is significantly greater for the firms with the higher levels of board independence sample, using a one-tailed t-test. The hypotheses are as follows:

Null Hypothesis

H_0: Adjusted ROA between different levels (specifically, between deciles)

of board independence = 0

Alternative Hypothesis
H_1: Adjusted ROA of firms with higher levels of board independence > Adjusted ROA of firms with lower levels of board independence

In addition, each sample is divided into firms with boards that are 75% and up in board independence vs. those with less than 75% independence (Lee and Carlson, 2007). Least-squares regressions are estimated using the industry-adjusted ROA as the dependent variable, and the explanatory variables include log of board size, insider holdings percentage, log of total assets (for firm size), and percentage of independence on the firm's board. If more independent boards and smaller board sizes are most effective, then a significant positive relationship between the industry-adjusted ROA and board independence, and a significant negative relationship between the industry-adjusted ROA and board size would be expected.

IV. Results

The results are interesting and appear to be consistent with theories that surround a small firm environment. As shown in Table II, the mean insider holdings percentage is about 7.5% for the small-cap firms, as compared to 2.60% for S & P 500 firms (Lee and Carlson, 2007). This is consistent with the small firm environment where management may have significant shareholdings in the firm. In many cases, the firm began as a family business and later became a public company, with family members serving as top management and maintaining a significant share of ownership in the company. As noted in a previous study (Eisenberg et al, 1998), small and midsized firms are frequently closely held, so the influence of agency problems between managers and shareholders on decisions affecting board size and structure are probably less prevalent in this class of firms. There is less separation of ownership and control in smaller firms, resulting in less conflict between management and the board. The industry-adjusted ROA is -1.75%, significantly lower than the -0.12% industry-adjusted ROA of larger firms in the S & P 500 firms. As reported in earlier studies (Eisenberg et al, 1998), smaller firms tend to have lower liquidity levels which may effect their ability to support high-growth strategies. Therefore, the lower industry-adjusted ROA's of smaller firms as compared to larger firms is not a surprise.

In the previous study of larger firms (Lee and Carlson, 2007), it was found that firms with more independent boards perform significantly better than those with less independent boards, and have significantly lower levels of insider ownership, as noted earlier. In this analysis of small-cap firms, as shown in Table III, there is no significant relationship between firm performance (as measured by the industry-adjusted ROA) and the level of board independence. However, similar to large firms, the more independent the board, there was significantly less insider ownership of the firm. The agency relationships are different in smaller firms in that, perhaps less monitoring by outside, independent members is needed for the firm to operate well. Smaller firms tend to have less agency costs since, many times, management is vested financially, and perhaps emotionally in the firm. Higher insider ownership is noted in previous studies of small to midsized firms (Eisenberg et al, 1998). Many firms in the sample have very high insider ownership by management, some over 25% of share holdings. With less separation of management control and ownership, there would be less conflicts (i.e., less agency costs) arising between management and shareholders.

A significant positive relationship between the firm performance measure and the level of board independence among larger firms such as the S & P 500 (Lee and Carlson, 2007) would be expected. However, with the smaller firms in this study, the need for independence on the board of directors may not be present. Surprisingly, from the results of the regression analysis with the industry-adjusted ROA as the dependent variable, it appears that there is a *negative*, not positive relationship between independence levels on the board and firm performance in this sample of small-cap firms. The percentage of independence on the board variable resulted in a t-value of -2.071 with less than 5% significance level. There was no significant relationship found between board size and firm performance for small-cap firms. It appears that board independence levels do matter in the case of small-cap firms, but not in the manner we would predict. Having insiders that have expertise, firm knowledge, and ties to the firm may help the performance of the company. Whereas, in a previous study with a sample of large S & P 500 firms, firm performance was improved with more independence and objectivity on the board.

V. Conclusions

The literature addresses the possible benefits of having very independent, objective boards resulting in more effective monitoring of management. In addition, it examines the possible benefits of having a smaller board and its effect on firm performance. Lee and Carlson (2007) find a significant positive relationship between the level of independence on the board of directors and firm performance among S & P 500 firms, large firms. This study extends the evidence on the relationship between board size/composition and firm performance. The agency relationships of small firms are different than those of larger firms, such as in the S & P 500. In this examination of small-cap firms there is evidence that board independence does not benefit firm performance, and may even hinder its performance. Perhaps in a small firm setting, firm performance is enhanced by having more insiders on the board that know the business rather than having the possible benefits of objectivity brought by outsiders. Also, it appears that board size may not be an important factor for smaller firms.

TABLE I
Small - Cap Companies by Industry
With Level of Board Independence
And Board Size

Industry(2-digit SIC)	N	Board Indep %	Board Size
Business Services (73)	48	66%	7
Commercial Banks (60)	36	71%	11
Radio, TV, Broadcast Equip (36)	33	63%	7
Industrial Measurement Instruments (38)	32	64%	7
Construction Machinery (35)	32	72%	8
Pharmaceuticals (28)	24	67%	8
Electrical Services (49)	21	77%	9
Crude Petroleum & Natural Gas (13)	20	62%	8
Electronics (50)	17	68%	8
Accident and Health Insurance (63)	13	61%	9
Restaurants (58)	13	63%	8
Textile: Apparel (56)	13	57%	7
Steel Works and Blast Furnaces (33)	12	65%	8
Metal Fabrications (34)	11	64%	8
Medical Laboratories (80)	10	58%	7
Real Estate Investment Trusts (67)	10	65%	8
Motor Vehicles (37)	9	70%	8
Apparel Stores (23)	8	54%	9
Bottled & Can Soft Drinks (20)	8	61%	9
Waste Management (87)	7	64%	9
Drug & Proprietary Stores (59)	7	57%	7
Food (Wholesale) (51)	7	66%	8
Trucking (42)	7	72%	7
Diversified Machinery (39)	7	62%	8
Other Industries (With N < 7)	81	73%	8
Total	486	Mean 66%	Mean 8

Board size is as of end of 2003. "Other Industries" contains 6 or fewer firms in its respective industry.

TABLE II
Descriptive Statistics of Small - Cap Companies: Divided by Level of Board Independence

Level of Board Independence		Total Assets ($ mill)	ROA (2003)	Industry-Adj ROA (2003)	Board Size	Insider Holdings %
≥ 90%	Mean	$ 2,061	2.00%	-2.8236 %	10.91	1.73%
	N	10	11	11	11	9
	Std. Deviation	2,099	5.36	4.47	145	0.91
80%≤ x < 90%		$ 1,935	2.41%	-1.4150%	8.10	3.27%
	N	103	104	103	107	95
	Std. Deviation	4,593	8.43	7.10	2.54	3.70
70%≤ x < 80%		$ 1,204	3.40%	-0.6919%	8.50	5.19%
	N	111	115	113	117	98
	Std. Deviation	1,591	10.05	10.17	1.83	6.57
60%≤ x < 70%		$ 1,711	2.23%	-3.0303%	7.97	7.46%
	N	97	96	93	100	86
	Std. Deviation	3,336	9.37	9.72	2.32	8.35
50%≤ x < 60%		$ 1,105	3.06%	-1.7857%	8.28	11.22%
	N	97	98	97	100	87
	Std. Deviation	1,543	8.55	8.79	2.09	11.59
40%≤ x < 50%		$ 1,159	2.04%	-3..8314%	8.38	16.55%
	N	29	29	28	29	26
	Std. Deviation	1,788	15.29	16.10	1.86	17.92
30% ≤ x < 40%		$ 1,428	5.72%	-0.8635%	8.46	11.35%
	N	22	23	23	24	20
	Std. Deviation	216.897	8.32	5.19	2.19	12.45
0% ≤ x < 30%		$ 435	6.03%	-1..3866%	6.84	17.18%
	N	7	7	7	7	7
	Std. Deviation	552	4.09	4.43	2.07	17.67
TOTAL (Mean)		$ 1,462	2.94%	-1.75%	8.29	7.48%
	N	476	483	475	495	428
	Std. Deviation	2,926	9.58	9.33	2.20	9.92

Table II contains descriptive characteristics of boards of directors of companies in the sample, consisting of 2,357 observations for 495 companies. Companies were included in the sample if they were identified as being in the S & P Small-Cap at the end of fiscal year 2003. The table represents the mean, number of observations, and standard deviation for each variable.

TABLE III
S & P Small – Cap Companies
Tests of Difference in Means of Variables
Between Board Independence Levels

Sample Divided into Percentage of Board Independence Deciles (e.g., boards with 90% and higher independence, boards with independence between 80% and less than 90%, ….): This tests if the mean of the variable is significantly different between firms with different levels of board independence.

Variable	F Statistic	Level of Significance
Industry-adjusted ROA	0.943	0.632
Firm Size (Total Assets)	0.873	0.539
Board Size	2.742	0.006 **
Insider Ownership	9.554	0.0001 **

Means of variables per deciles are shown in Table II.

Sample Divided into Two Samples of Board Independence: Firms with board independence of 75% and higher, and firms with board independence lower than 75%. This tests if the mean of the variable is significantly different between the two samples.

Variable	Means 75% and Up	Means Below 75%	F Stat
Industry-adjusted ROA	-1.1676%	-2.0623	0.987
Firm Size (Total Assets) In millions	$ 1,721	$ 1,329	1.914
Board Size	8.45	8.21	1.337
Insider Ownership	4.05%	9.27%	28.372 **

**** Significant at the 1% level**

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Detection of Multiple Beta Shifts in Mutual Fund Returns Data

Thomas S. Howe and Ralph A. Pope

Abstract

Research suggests that mutual fund betas are not stationary. However, the performance of the nonstationarity tests has been called into question. This study examines the ability of four such tests. None of the tests shows good ability to detect sudden 25 percent beta shifts, and two of the tests have inflated, one of them grossly inflated, Type I error rates.

I. Introduction

For nearly four decades, studies have used the single index market model (Sharpe 1963) to analyze risk or performance of stocks, often in response to an information-containing event. The market model is

$$R_{it} = a_i + b_i R_{mt} + u_{it} \quad (1)$$

where R denotes return, i and t denote the asset and time period, m denotes the market, b is the beta, that is, the sensitivity of the asset returns to the market returns, a is the intercept, and u is an error term. Despite studies which question the appropriateness of this model, for example, Fama and French (1992), beta continues to be widely reported by providers of data used by individual and institutional investors.

Early research into the consistency of the beta of common stocks over time indicates that the betas of individual assets are nonstationary (Levy 1971). Recent studies which acknowledge this nonstationarity include Graddy, Kyle, Strickland, and Bass (2004) and Kaplanski (2004). One parameter stability model is the shifting regimes model (Mehta and Beranek 1982; Bey 1983; McDonald 1983; Hays and Upton 1986; Bauer Hays and Upton 1987), in which the return-generating process is assumed to follow a stationary regime for n_1 periods, then shift to another stationary regime for n_2 periods, and so on. The shifts are considered to be infrequent; that is, for any given k, n_k is large enough for reliable estimation of the parameters.

Major difficulties in applying the shifting regimes model are the detection and location of regime shifts. Possible techniques include the Chow (1960), Farley-Hinich (1970), recursive residual (RR) (Brown, Durbin, and Evans 1975), and dummy variable (Harvey 1976) tests, and variable parameter regression (Garbade 1977) for the detection of a change, and the Quandt log likelihood ratio (LR) (1958,1960) for both detection and location of the change. The RR and LR are often used in combination, the first to detect the presence of a shift and the second to estimate the shift point. Garbade (1977) and Farley, Hinich, and McGuire (1975), however, raise questions about the suitability of the RR and LR techniques.

To the extent that the methodology is inadequate, the previous research is called into question. For example, Howe and Upton (1992), suggest that an individual stock's beta shift is difficult to detect reliably, thus calling into question the results of studies such as Hays and Upton (1986). In addition, Howe and Pope (2005, 2006) suggest that attempts to detect multiple beta shifts in daily stock return data are fruitless.

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Because mutual funds are portfolios, in which normally no one security has a weight of more than five percent, one would expect the error variance of market model regressions on mutual fund returns to be lower than the error variance of market model regressions on returns for individual stocks. Thus, the results of Howe and Pope (2005, 2006) may not apply to mutual fund returns data. If a procedure intended to detect beta changes has any ability to detect beta changes this ability should be greater for mutual fund returns than for stock returns.

The study evaluates the ability to detect beta changes in mutual funds. Miller and Gressis (1980) and Bauer, Hays, and Upton (1987) apply beta change detection methods to actual returns on mutual funds. However, because one does not know whether a beta change actually occurred, one cannot draw conclusions regarding the power or Type I error rate of their tests. The study applies the methodology of Howe and Pope (2005, 2006) to simulated mutual fund return data to examine the power, Type I error rate, and outlier sensitivity of the partition regression (Guthery 1974; Miller and Gressis 1980) and sequential variations of the Brown-Durbin-Evans (BDE) cumulative sum of the squared recursive residuals (Brown, Durbin, and Evans 1975; Hays and Upton 1986), stabilogram (Ashley 1984), and variable parameter regression (Garbade 1977) techniques.

This study finds both procedures used by Miller and Gressis (1980) and Bauer, Hays, and Upton (1987) to be unsatisfactory—the recursive residual procedure primarily because of its low power and the partition regression procedure because of its extremely high Type I error rate. It finds the cumulative sum of the squared recursive residuals procedure to be sensitive to extreme observations, though less so than in Howe and Upton (1992) and Howe and Pope (2005, 2006). On the other hand, the variable parameter and stabilogram procedures do not show such high Type I error rates, and show much more power than the recursive residuals test. Only the variable parameter and stabilogram procedures show any appreciable ability to detect a second beta shift; even they fail to detect a second beta shift more than 22.5 percent of the time. None of the methods shows any appreciable ability to detect any beta changes beyond the second. Still, the procedures show better detection ability when applied to simulated mutual fund returns than when applied to simulated returns on individual stocks.

II. Methodology

Techniques for Detection of Parameter Shifts

Variable Parameter Regression (VPR)

Variable parameter regression assumes that beta follows a random walk. If we express this as $b_t = b_{t-1} + P$, where b_t is the beta for period t and P is the drift parameter, the null hypothesis is that P=0. The maximum likelihood estimate of P is asymptotically chi-squared with one degree of freedom. A full discussion of variable parameter regression can be found in Garbade (1977).

Stabilogram (STAB)

The stabilogram procedure divides the period to be studied into a number of subperiods of approximately equal length. Dummy and interactive variables are used to obtain ordinary least squares estimates of the market model parameters for the subperiods. The stabilogram procedure

considers the market model parameters to be unstable if the null hypothesis that the market model parameters for all subperiods are equal is rejected.

Cumulative Sum of the Squared Recursive Residuals (RR)

Recursive residuals are obtained by recursively computing the standardized prediction error of r_{it} when the market model parameters are estimated from the preceding t-1 observations. Under the null hypothesis of no parameter change, the errors are independent and distributed $N(0,s^2)$. A shift in a_i, b_i, or the error variance is indicated if a residual shows significant departure from zero. BDE present tests on the cumulative sum (cusum) of the recursive residuals and on the cusum of the squared recursive residuals. This study uses the latter test because Garbade (1977) found it to be much more powerful than the former. A full discussion of the technique can be found in Brown, Durbin, and Evans (1975).

One problem with the RR technique is that the distribution of the test statistic is known only under the null hypothesis, and will be violated in the presence of multiple shifts. Additionally, it has been suggested that the RR technique is sensitive to outliers or other departures from the assumed conditions. In response to these objections, several papers (for example, Hays and Upton (1986) and Johnson (1989)) have used a sequential approach for the RR technique, in which the RR technique is applied to progressively longer periods to avoid the possibility of multiple shifts. In this approach, shift indications are accepted as valid only if consistently observed, and the analysis is restarted after a shift has been detected. A full discussion of this approach can be found in Hays and Upton (1986).

Howe and Upton (1992) suggest that the VPR technique does not show this outlier sensitivity. Also, one can infer from their Chow test results that the STAB technique would likely be insensitive to outliers. However, the VPR and STAB techniques, as originally presented, test for general instability rather than multiple shifts. To attempt to detect multiple beta shifts, this study modifies these techniques by using a sequential approach.

Garbade (1977) compared the ability of RR and VPR to detect instability in the coefficients of a linear regression model, and found that the VPR dominated. In addition to comparing a larger number of techniques, this study differs from Garbade in using conditions which are more realistic for event-study applications, and by including a number of conditions not investigated by Garbade. Additionally, Garbade used only totally simulated data, while this study uses simulations based on observed market data to include the possible effects of instabilities in the market process.

Partition Regression (PR)

The partition regression approach presented by Guthery (1974) and applied by Miller and Gressis (1980) differs from the RR, VPR, and STAB approaches in that it was originally designed to attempt to identify multiple parameter shifts rather than a single shift. Partition regression employs the following algorithm.

1. Divide the period into subperiods (initially two) so as to minimize the error sum of squares.

2. For each set of neighboring subperiods, use Chow (1960) tests to test the null hypothesis that the market model parameters of the two subperiods are equal.

3. If the null hypothesis is rejected for all neighboring subperiods, increase the number of subperiods by one and go to step 1.

4. If any of the Chow tests on neighboring subperiods are not rejected, stop the procedure. The number of parameter shifts is considered to be two fewer than the number of subperiods most recently examined.

Technique for Shift Point Locations

The log likelihood ratio (LR) can be calculated as follows:

$$LR = \ln \left[\frac{\text{likelihood of the observations under } H_0 \text{ (no parameter change)}}{\text{likelihood of the observations under } H_1} \right]$$

It can be used to detect the presence of a shift by examining the size of the minimum value over the period of interest. The distribution of the ratio has not yet been specified, however, and application of the technique to the detection of a shift itself is judgmental in nature. Because of the qualitative nature of the technique, it is sometimes used in conjunction with other techniques (such as the RR) as a method of locating the shift point. That is, given that a shift has been detected within a series of observations, the likely location of the shift is at the minimum of the ratio.

III. Return Simulations

Market-based simulated mutual fund return series are generated using the following form of the single index model:

$$r_{it} = r_{ft} + b_{1it}(r_{mt} - r_{ft}) + u_{it} , \qquad (2)$$

where:

r_{it} = the return of simulated mutual fund i in period t
b_{1it} = the beta coefficient for mutual fund i in period t
u_{it} = error term
r_{mt} = observed weekly returns to the S&P 500
r_{ft} = weekly yield on 90-day Treasury bills.

The choice of which differencing interval (daily vs. weekly vs. monthly) to use is not clear. On one hand, increasing the differencing interval improves the fit of the market model. On the other hand, increasing the differencing interval reduces the number of observations. For comparability with Miller and Gressis (1980) and Bauer, Hays and Upton (1987), each series

contains 104 weekly returns. These simulated returns are based on the S&P 500 and Treasury bill returns over the period from January 3, 2001 through March 31, 2007, with the week of September 11, 2001 and the following week deleted because of the closing of markets and unusual market volatility during those weeks.

Two hundred simulated return series (corresponding to 200 funds) are created. The betas are estimated from a set of 200 growth, growth/income, equity income, aggressive growth, small cap, and mid cap ("traditional equity") funds that is randomly chosen except that funds with beta estimates of less than 0.0 or more than 2.0 are excluded.

In order to provide a variety of conditions under which the techniques can be tested, the parameters in (2) are varied as follows:

b_{1it}: Eight conditions of change: (a) constant beta (no change), (b) a 0.25 increase in beta, (c) two 0.25 increases in beta, (d) three 0.25 increases in beta, (e) a 0.25 increase in beta, followed by a 0.25 decrease in beta, so the beta after the second shift is the same as the beta before the first shift, (f) a 0.25 increase in beta, followed by a 0.25 decrease in beta, followed by a 0.25 increase in beta, (g) two 0.25 decreases in beta followed by a 0.25 increase in beta, and (h) two 0.25 increases in beta followed by a 0.25 decrease in beta For each simulated fund, three beta change dates are selected at random from a uniform distribution consisting of weeks 3 through 101.

u_{it}: Two distributions of error terms: a) Normal (Stable Paretian with $\alpha = 2.0$) and b) Stable Paretian with $\alpha = 1.95$. These values are consistent with those observed by Fama (1965). The mean of the distributions is zero. The variance (scale factor in the case of the Stable Paretian 1.95 error terms) is estimated from a randomly chosen set of 200 traditional equity funds.

This results in eight beta change conditions and two error term distributions, or 16 (8×2) data sets. Each data set is composed of 104 observations for each of 200 funds.

Procedure

This study applies the detection techniques to the sixteen data sets at the 0.05 significance level. The RR test is performed on the first four observations. After that, we increased the interval tested four observations at a time between RR tests. In this study, for a shift indication to be considered consistent and persistent one of the following conditions has to be met:

1. three consecutive indications of significance, all with the same LR estimate of the location of the shift

2. four consecutive indications of significant, with three identical LR estimates of the location of the shift

This is consistent with (though not identical to) the procedure used by Bauer, Hays and Upton (1987).

In the STAB procedure, there is a tradeoff regarding the number of subperiods. The fewer the subperiods, the more degrees of freedom there are, but using fewer, but longer, subperiods reduces the ability of the procedure to identify relatively short regimes. This study uses four subperiods in all stabilogram runs.

As in Howe and Pope (2005, 2006), this study uses the minimum of the LR as the estimate of the beta change date in the sequential application of the VPR and STAB procedures. After obtaining this estimate, the study performs the VPR or STAB procedures on the two regimes that are immediately before and after the LR minimum.

This method of locating beta shifts has the weakness of indicating a disproportionate number of the shifts in the first few or last few observations of the return series. Many of these shift indications are likely spurious. At the same time, if one treats indications of shifts in the first few or last few observations to be spurious, one may miss actual beta shifts. As a compromise, this study constrains the beta shift indications to between approximately the $N/8^{th}$ and $7N/8^{th}$ observation, where N is the number of returns in the series being tested for beta changes.

The results from the data sets with no beta change indicate the Type I error rate. The techniques are then compared on the basis of their ability to detect shifts in beta by examining the frequency of detection in data sets with one or more beta changes. The robustness of the techniques is investigated by comparing the changes in Type I error and detection frequency for the data sets with normally-distributed error terms with the Type I error and detection frequency for the data sets with Stable Paretian 1.95 error terms.

IV. Expectations

Given the results of Ashley (1984), one would expect the VPR test to be conservative; Ashley attributes this at least partly to the fact that the test statistic is only approximately chi-squared. On the other hand, because the Chow tests involved in the stabilogram procedure are exact, one would expect the Type I error rate of the stabilogram to approximately equal the significance level, in this study 5 percent.

The partition regression procedure involves calculating the SSE for all possible parameter shift points and choosing the shift point(s) which minimize the SSE. Only after that is a Chow test run to test for parameter instability. Since this amounts to running all possible Chow tests and choosing the one which produces the highest F-statistic, the expectation is that the Type I error rate is greater than the significance level.

It is not clear *a priori* whether the sequential RR procedure employed in this study has a Type I error rate greater than or less than the significance level of the test. One would expect the requirement that the RR procedure's indication of parameter change be persistent and consistent to weaken the test. On the other hand, the fact that the RR procedure is repeated a number of times over progressively longer subsets of the return series increases the probability of finding three or more consecutive indications of significance within any given simulated security return series. Given the extreme sensitivity to outliers documented in Howe and Upton (1992), one

would expect more indications of significance when the error terms have a Stable Paretian distribution than when they are normally distributed.

In theory, it is not clear whether one would expect the tests to be more powerful than in Howe and Pope (2006). On one hand, there are fewer observations (104 in this study versus 180 in Howe and Pope (2006)) and this study uses simulated weekly returns rather than simulated monthly returns. On the other hand, mutual funds are portfolios rather than individual stocks, and thus have much higher market model R^2s than individual stocks do. For example, the funds in the Bauer-Hays-Upton study have an average R^2 of approximately 0.8. This compares with a typical market model R^2 of about 0.3 when using monthly returns. One would expect the effect of the difference in R^2 to be much stronger than the effect of the difference in degrees of freedom. Therefore, in the samples with one or more beta changes, we would expect more ability to detect the beta changes than in Howe and Pope (2006).

V. Results

Table I presents the first-pass rejection frequencies, that is, the frequencies with which the null hypothesis of no beta change is rejected. Only the partition regression procedure shows a detection rate of greater than 22 percent in the normally distributed sample with one beta change, and when there is no change it reports a beta change in at least 36.5 percent of the cases. The more beta increases there are the more likely it becomes that there will be an indication of beta instability. Also, in most cases there is more likely to be an indication of a beta change when there are two or more consecutive beta changes in the same direction than when there are not two or more consecutive beta changes in the same direction.

This study suggests the RR method has a slight ability to detect beta changes in weekly mutual fund returns; but not as much as the other methods. In fact, in two of the samples the number of cases is which a beta change was detected is not significantly greater than that of the corresponding no beta change sample at the 0.05 level. Also, the results from the samples with Stable Paretian error terms indicate that the procedure is sensitive to extreme observations, though not as sensitive as when the method is applied to simulated stock return data (Howe and Upton (1992); Howe and Pope (2005, 2006)). Finally, the rejection frequency of the null hypothesis of no beta change when there is in fact no beta change and the error terms are normally distributed (8.5%) is substantially greater than the 5 percent one would expect. A binomial test finds this difference to be significant with a p-value of 0.0121.

The PR procedure does appear to show some ability to detect beta changes. Also, the PR procedure appears to be largely unaffected by extreme observations, such as those found in the Stable Paretian samples. However, as expected, the Type I error rate of the PR procedure in the no beta change samples is significantly higher than the 5 percent one would expect (p-value = 1.01×10^{-42}). As expected, the ability to detect beta changes is greater than what Howe and Pope (2005, 2006) report for returns on individual stocks.

Consistent with the findings of Ashley (1984), the VPR test is conservative, with Type I error rates of 0.5 to 3 percent when the VPR test is run at the 5 percent level. In all of the samples in this study except the sample with three beta increases the VPR procedure detects a beta change less than half of the time. A McNemar (1962) test on the rejection frequencies on the normally-distributed no beta change sample versus the Stable Paretian 1.95 no beta change

sample does not suggest that the VPR test is sensitive to extreme observations (two-tailed p-value = 0.119). The ability to detect beta changes is considerably greater than that for individual stocks reported by Howe and Pope (2005, 2006).

The stabilogram test shows more power than the VPR test in virtually all of the samples. Also, the STAB test appears to be robust to extreme observations. As is the case with the other tests, the stabilogram test shows much more power than when applied to individual stock returns.

Table II presents cumulative frequency distributions of the number of beta shifts indicated by the RR procedure. In the samples with normally distributed error terms, there were no cases in which three beta shifts were indicated, and only a few cases in which two beta shifts were indicated. There appears to be no relationship between the number of cases in which two beta changes were indicated by the procedure and the actual beta change pattern. Although the Stable Paretian error term samples showed indication of more beta changes than the normally distributed error term samples, the incidence of these indications appears to be unrelated to the actual beta change pattern. The number of beta changes detected is less than the number Howe and Pope (2005, 2006) find when using stock returns.

Table III presents cumulative frequency distributions of the number of shifts indicated by the partition regression procedure. In the samples with two or more beta changes, the procedure gives an indication of two or more beta changes no more than 4 percent of the time—much less often than Howe and Pope (2005, 2006) find in individual stock returns. Furthermore, there appears to be no correlation between the number of actual beta changes and the number of beta changes indicated by partition regression.

Table IV presents cumulative frequency distributions of the number of beta shifts indicated by the VPR procedure. Consistent with the results in Table I, the samples with more actual beta changes generally yield more indications of any given number of beta changes. However, in the samples with two beta changes, the second one is rarely detected, and in samples with three beta changes the third one is detected in less than 2 percent of the cases. For the most part, there appear to be indications of more market model parameter changes per security in the samples with Stable Paretian error terms than in the samples with normal error terms; however, the difference is not large This suggests that when applied sequentially the VPR procedure shows little sensitivity to extreme observations. The number of beta change indications is considerably less than when using series of 600 daily or 180 monthly simulated stock returns (Howe and Pope 2005, 2006).

Table V presents cumulative frequency distributions of the number of beta shifts indicated by the STAB procedure. Consistent with the results in Table I, the samples with more actual beta changes generally yield more indications of any given number of beta changes. However, the procedure detects a third beta change in no more than 3.5 percent of the securities in any of the samples. The number of beta change indications is slightly greater than when using series of 180 monthly simulated stock returns (Howe and Pope 2006) but less than when using series of 600 daily simulated stock returns (Howe and Pope 2005) .

VI. Summary and Conclusion

This study has examined the power and Type I error rate of four methods of testing for regression parameter changes when applied to detecting beta changes in weekly traditional equity mutual fund returns. The study used simulated mutual fund return series with known betas, error variances, beta change dates, and error term distributions.

The study found the two methods used by Bauer, Hays, and Upton (1987) not to work well in detecting beta changes in simulated weekly mutual fund returns. The recursive residual procedure showed a slightly inflated Type I error rate and only a slight ability to detect a single 25% beta change, and was somewhat sensitive to extreme observations. While using a Chow test to verify the regime shifts, as done in Bauer, Hays, and Upton (1987) would most likely have reduced the Type I error rate, it also would most likely have reduced the already poor ability of the recursive residuals procedure to detect a single beta change. As expected, the partition regression procedure had a grossly inflated Type I error rate. . This calls into question the results of Miller and Gressis (1980) and Bauer, Hays, and Upton (1987). On the other hand, variable parameter regression and, in particular, the stabilogram procedure showed some ability to detect market model parameter changes. Still, only in the case of three 25 percent increases in beta was the change in beta was detected in more than half of the cases at the 5 percent significance level.

For the recursive residuals and partition regression procedures the number of beta change indications is less than those in Miller and Gressis (1980) and Bauer, Hays, and Upton (1987) Furthermore, none of the tests showed much ability to detect more than one known beta change. This suggests that many of the apparent indications of beta shifts indicated by the recursive residuals and partition regression procedures are false signals. The number of second and subsequent beta changes indicated by the variable parameter regression and stabilogram procedures is generally higher than that reported in Howe and Pope (2005, 2006), a finding which is not surprising, considering the lower error variance in mutual fund returns as compared to returns of individual stocks. It is not clear whether the stabilogram procedure is better than the variable parameter regression procedure.

On one hand, the stabilogram procedure generally seems to have better ability to detect at least the first beta change. On the other hand, depending on the length of the series of the series of returns the number of degrees of freedom may become more problematic for the stabilogram procedure than for the variable parameter regression procedure. Beta is a fundamental variable in two measures of risk-adjusted performance, the Treynor (1965) measure and Jensen's (1968) alpha. Because failure to allow for beta changes can make beta estimates biased and inefficient (Kon and Lau, 1979), it would be ideal if one could allow for beta changes when measuring risk-adjusted performance. Unfortunately, even in the case of traditional equity mutual funds, which fit the market model much better than individual common stocks do, the ability to detect beta changes appears to be very limited.

There are at least two general areas for further study. First, the variable parameter regression and stabilogram procedures could be applied to the data used by Bauer, Hays, and Upton (1987). Second, there are other tests that could be employed, such as sequential versions of central Chow tests, Farley-Hinich tests, and dummy variable tests specifically aimed at detecting beta changes rather than market model parameter changes in general.

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Table I. First Pass Rejection Frequencies of Null Hypothesis of No Market Model Parameter Change (N=200)

Beta Change Pattern*	RR**	PR	VPR	STAB
		Normal Error Terms		
OOO	8.5%	36.5%	0.5%	6.5%
UOO	10.0%	63.0%	10.5%	22.0%
UUO	12.5%	80.5%	38.0%	45.0%
UUU	19.0%	90.0%	55.0%	69.0%
UDO	10.5%	54.5%	5.0%	15.0%
UDU	9.0%	57.0%	8.5%	22.0%
DDU	9.5%	72.0%	24.5%	34.5%
UUD	13.5%	70.0%	25.0%	33.5%
		Stable Paretian 1.95 Error Terms		
OOO	19.5%	42.0%	3.0%	6.0%
UOO	24.0%	59.0%	14.0%	21.0%
UUO	25.0%	79.0%	35.5%	40.5%
UUU	34.0%	87.5%	54.0%	64.5%
UDO	23.0%	53.0%	9.0%	12.5%
UDU	24.0%	54.5%	10.5%	20.5%
DDU	26.0%	70.5%	22.5%	21.0%
UUD	28.0%	65.5%	21.5%	31.0%

* O, U, and D denote no change, an increase, and a decrease, respectively. Therefore, for example, UDO refers to a beta increase, followed by a beta decrease, followed by no beta change.

** RR, PR, VPR, and STAB refer to the recursive residuals, partition regression, variable parameter regression, and stabilogram procedures, respectively.

Table II. Cumulative Frequency Distributions of Number of Parameter Shifts Detected by the Recursive Residuals Procedure (N=200)

Beta Change Pattern	Number of Shifts 1	2	3
		Normal Error Terms	
OOO	17	3	
UOO	20	3	
UUO	25	4	
UUU	38	3	
UDO	21	2	
UDU	18	1	
DDU	19	4	
UUD	27	2	
		Stable Paretian 1.95 Error Terms	
OOO	39	15	2
UOO	48	17	3
UUO	50	20	5
UUU	68	19	3
UDO	46	18	1
UDU	48	18	1
DDU	52	19	2
UUD	56	19	4

Table III. Cumulative Frequency Distributions of Number of Parameter Shifts Detected by Partition Regression (N=200)

	Number of Shifts			
Beta Change Pattern	1	2	3	4+
	Normal Error Terms			
OOO	73			
UOO	126	2	1	1
UUO	161	3	2	
UUU	180	4	3	1
UDO	109	2	1	
UDU	114	2	1	1
DDU	144	8	5	2
UUD	140			
	Stable Paretian 1.95 Error Terms			
OOO	84	2		
UOO	118	4	1	
UUO	158	4	1	
UUU	175	5	2	1
UDO	106	4	1	
UDU	109	2		
DDU	141	8	3	1
UUD	131	1		

Table IV. Cumulative Frequency Distributions of Number of Parameter Shifts Detected by Variable Parameter Regression (N=200)

	Number of Shifts			
Beta Change Pattern	1	2	3	4
	Normal Error Terms			
OOO	1			
UOO	21	9		
UUO	77	23		
UUU	110	44	2	
UDO	10	6		
UDU	17	6	1	
DDU	49	34	1	1
UUD	50	32	1	
	Stable Paretian 1.95 Error Terms			
OOO	6	2	1	
UOO	28	12	1	
UUO	71	24	1	
UUU	108	45	3	1
UDO	18	8	2	
UDU	21	8	2	
DDU	45	30	4	
UUD	43	27	3	1

Table V. Cumulative Frequency Distributions of Number of Parameter Shifts Detected by the Stabilogram Procedure (N=200)

	Number of Shifts			
Beta Change Pattern	1	2	3	4+
		Normal Error Terms		
OOO	13	3		
UOO	44	8	1	
UUO	90	18	3	1
UUU	138	30	3	
UDO	30	8	4	
UDU	44	8	1	
DDU	69	19	7	1
UUD	67	14	4	1
		Stable Paretian 1.95 Error Terms		
OOO	12	2		
UOO	42	6	1	
UUO	81	16	2	1
UUU	129	26	4	1
UDO	25	6	4	
UDU	41	7	3	
DDU	64	16	4	1
UUD	62	12	4	1

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Does it Pay to Invest in Middle East and North Africa Markets?

Tarek S. Zaher

Abstract

This paper examines the evidence underlying the notion that there is increased integration of MENA and developed country financial markets and that MENA market equities do not represent a separate asset class. We analyzed the correlation structures among individual country equity markets and efficient frontiers over two sub periods. We also analyzed the structure of the correlations among political risk indicators for a similar group of countries over similar time periods. The results of the study suggest that capital market integration has accelerated in recent years, both economically and politically but only for three countries in the MENA region. We therefore, conclude that the MENA market countries should continue to be viewed as a separate asset class from developed countries. These markets seem to be highly segmented and provide great diversification potentials to global investors.

I. Introduction

The Middle East and North Africa (MENA) region continues to test the patience of both custodians and investors alike. Political instability, arcane market practices, and thin trading volumes mean that many of the region's markets are of only peripheral interest to global custodians and investors. The view of many of the region's sub-custodians is that MENA markets region is one of the most challenging markets in the world. Although progress can seem painfully slow, with many plans and little implementation, there are signs that the region's markets are taking greater efforts to attract foreign investors. None of the MENA countries can claim to meet all of the International Securities Services Association (ISSA) market recommendations, but some of these markets have most of them. However the market's infrastructure is expected to continue to improve dramatically in some of these markets. Many of MENA countries realize the need for a much stronger capital market and that more need to be done to make these market prosper and create a safer atmosphere for investors. As more foreign and local companies set up there operations in The Middle East and North Africa there will be an increase in demand for capital, so MENA markets would need the infrastructure to help that development. Including changes to procedures, laws and the professional infrastructure within the financial market and better dissemination of information. In addition MENA markets should have the ability to provide regional and international connectivity by complying with the international and regional laws. This will make these markets more attractive to foreign investors.

Recently a major boom was observed in the MENA stock markets. Most stock markets in the region have seen heavy investments which have pushed the key indices to very high levels, thus suggesting a bubble in MENA markets for some observers. Almost all of the stock markets registered a noticeable improvement in their performance during the 2003-2005 period. Sedik and Petri (2006) reports that the Arab Monetary Fund (AMF) composite index valued in U.S. dollars went up by 52 percent in 2004 and by about 91.6 percent in 2005. One possible

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explanation for the improvement in the MENA stock market performance is the increased liquidity and improved economic fundamentals in the region due to high oil prices. This has led to the large accumulation of reserves by oil exporting countries and appears to have contributed significantly to asset price appreciation in the Middle East. Another possible explanation is the relative reluctance of the Arab rich nationals to invest in overseas markets after the events of September 11, 2001 and instead invested in local markets. The improved performance in MENA stock markets did not last for too long and most of these markets witnessed a major correction in the first half of 2006.

In this paper we test whether MENA markets provide global investors the opportunity to earn high return and great diversification potentials. We examine the evidence underlying the notion that there is increased integration of MENA and developed country financial markets and that MENA market equities do not represent a separate asset class. We analyze the correlation structures among individual country equity markets during the 1995-2004 period. In particular we compare the individual country (MSCI) stock return correlation structures and efficient frontiers over the 1995-1999 and the 2000-2004 sub-periods. We also analyze the structure of the correlations among political risk indicators for a similar group of countries over similar time periods.

II. Literature Review

When they make their portfolio allocation decisions, International investors have historically treated securities in emerging markets including Middle Eastern and North African (MENA) markets as a separate asset class. There is well documented evidence that emerging markets have high average stock returns and low correlations with developed markets and therefore they became an attractive choice for diversifying portfolios. De santis and Gerard (1997) finds that adding assets from emerging markets to a benchmark portfolio that contains US assets creates a new portfolio with considerable improvement in reward-to-risk performance. Harvey (1995a) suggest that adding equity investments from emerging markets to a portfolio of developed equity market shifts significantly the mean-variance efficient frontier to the left. However, recent developments in the economic, legal, accounting, and financial systems in MENA may erode the sources of separation between MENA markets and developing markets and increased the integration between the two markets. Henry (2000) and Bekaert, Harvey, and Lumsdaine (1998) found a whole spectrum of financial liberalization developments that have eased the flow of capital into and out of emerging markets. Included in these liberalizations are capital market reforms that have reduced the constraints and limits on foreign investor's holdings in local firm's equities and the establishment of country funds.

III. Data and Quantitative Evidence

A. Data

This section compares the empirical characteristics of the Arab MENA markets with those of selected developed markets. The return series were obtained from DataStream data set and consist of monthly stock return series over the ten year period Jan 1, 1995 to December 31, 2004. We use monthly return to avoid biases that could result from non-trading days, non-synchronous trading hours and days, and to avoid the noise commonly associated with them. There are several possible sources for MENA market returns: MSCI, IFC, and local index. Each of these sources started to cover MENA markets at different dates. In this study we chose the provider that started the coverage the earliest. For instance, Jordan and Turkey were covered by

MSCI in the late 80s, while Egypt, Israel, and Morocco were during the 90s. Saudi Arabia, Bahrain and Oman are only covered by IFC. Kuwait, Lebanon and Tunisia price series are only available in local indices and their coverage started in the 90s. The price series for developed markets are available since the 60s or the 70s through MSCI. We chose a starting date of January 1st, 1995 because nine of the eleven MENA return series are only available after 1990. The observation periods for all countries are not the same, but the construction of the indices is based on value-weighted portfolios. MSCI and IFC indices are usually highly correlated and reflect a constant methodology across markets; they capture the spirit of an all-share index by including replicable subsets of shares and targeting sixty percent of total market capitalization. These indices do not take into consideration restrictions on foreign ownership.

The equity returns presented are calculated in U.S. Dollars. This is more appropriate in segmented markets because inflation trends are taken into account through Fisher's equation (Liew, 1995) and it provides uniformity in the comparison of one market to another. When we used local series to collect the return for Kuwait, Lebanon and Tunisia, prices were converted in US dollars using the exchange rate series provided by DataStream.

B. Risk and Returns Evidence

Table 2 shows the monthly returns and risks (standard deviations) for ten MENA countries over the period of study (1995-2004) and the two sub periods (1995-1999 and 2000-2004). For comparison purposes, we also show the returns and risks on three international MSCI indexes: the Emerging Market (EM), the World index, and the Middle East Index (ME). We also include monthly equity returns and risks for three developed markets, Japan, UK, and USA. We compute monthly returns as the natural logarithmic difference of the monthly prices times 100, that is 100*Log (Pt/Pt-1). The summary statistics of the monthly stock index returns are presented in U.S. dollar terms. The results show little evidence of risk-return hypothesis (higher risk implies higher return) in selected MENA stock markets. Second, the pattern of higher emerging market returns (means) and high risks (standard deviations) compared to the developed countries that has been documented in a number of studies including De Santis and Gerard (1997), Harvey (1995a) and Saunders and Walter (2002,) is partially supported in this study. The mean of monthly return during the ten years period (1995-2004) were relatively lower than the selected developed countries and the world index return for most of the MENA countries. Very high return was recorded only for Saudi Arabia (1.33%) and Turkey (0.85%). The returns for Morocco (0.64%), Oman (0.69%), Bahrain (.54%), Israel (0.57%), and Jordan (0.52%) are lower than UK (0.76%) and USA (0.80%), but higher than Japan (0.45%) and the World return (0.46%). The monthly risk adjusted return (Sharp Measure: Mean return/Std Dev.) was also relatively high for the same countries. Saudi Arabia has the highest adjusted return (0.28%).

Relative high return was observed only for three of the MENA countries (Saudi Arabia, Morocco, and Israel) during the 1995-1999 sub periods. There was, however, a major increase in the risk level (Standard deviation) for most of the MENA countries during this sub period. As a result, the risk adjusted return for all of the MENA countries (except Saudi Arabia) dropped below the risk adjusted return for UK, USA, and the world. On the other hand, most of the MENA countries outperformed the emerging market index adjusted return (which turned negative), and some MENA countries also outperformed Japan.

During the second sub period (2000-2004), a major shift in the relative performance of developed countries and MENA countries occurred. The high positive return and risk adjusted return for the developed countries and the world changed to a high negative return, while five of

the ten MENA countries continued to have high positive return and risk adjusted return. The tragedy of September 11 may have had a distorting impact on returns and risks of developed countries in the period immediately surrounding the tragedy.

When making their asset allocation decisions to international portfolios, investors and portfolio managers consider individual returns and risks as important ingredients for their decision making process. However, correlations among country returns are also essential and important factors that will influence the investor's decision. For example, if correlations between MENA markets and developed market countries have risen with time, this would support the view that these countries' equity markets are converging toward a single asset class. Thus indicating a greater integration of world capital markets. Therefore, investors or portfolio fund managers are less able to achieve gross diversification gains by allocating some of their assets to investment in MENA markets.

We examined the monthly return correlation relationships using U.S. dollar-adjusted returns to test the degree to which correlations among MENA and developed countries have changed. We computed correlations for each of the two equal sub periods in the study (1995-1999 and 2000-2004) separately. Table 2 shows the correlations among developed and MENA countries in each of the two sub periods analyzed, as well as correlation-by-correlation tests as to whether MENA market-developed country correlations increased over the later sub period (2000-2004) compared to the (1995-1999) sub period.

Table 2 shows that the correlations for most MENA market-developed country did not increase from the first to the second sub-period. The same can be said about the MENA market-World correlations. However, a major increase in the correlation was observed for Tunisia and Morocco, and to a lesser extent for Turkey. The Z-ratio test as to whether a correlation increased to a statistically significant degree is significant at the 10% confidence level (or above) in only three cases. Tunisia is showing statistically significant increase in the correlation with Japan, USA, and the world, but not with UK. Morocco is showing significant increase in correlation with Japan and UK only, while Turkey is having an increase in correlation with USA and the World only.

To test for the effects of the increased correlations (integration) on the potential gains from simple country-by-country diversification, we compared the efficient mean-variance of returns frontier based on monthly country index returns for the 1995-1999 period with the efficient frontier for the 2000-2004 period. Exhibit 1 shows the efficient frontier for both sub periods. It is clear that there are some gains from simple country-by-country diversification in the 2000-2004 sub period over all risk-return ranges. The slightly more convex frontier in the second sub period reflects the low positive or lack of correlation among country returns shown in table 2. These findings indicate that simple asset allocations into some MENA countries will enhance the performance for investors or portfolio managers in some developed countries. In developing their strategies, managers need to be selective in including some of the MENA market countries in their investment plans since only few of these countries showed increased correlation over time with the developed countries. Attention should also be given to industry as well as firm analysis in these countries.

Mei [1999], among others, has found that political events have had significant impact on some capital markets around the world. We therefore, tested also whether political factors have had an impact on return correlations. We used changes in Political Risk Guide's monthly index of political risk to analyze political trends among MENA and developed market countries. According to the ICRG political risk assessment, countries are rated on a scale of 1 to 100, a high

rating means less risky and a low rating means more risky. As it is evident in table 3, little more than half of political risk correlations are positive and the remaining correlations are negative in both sub periods. Further tests of significant differences in correlation of political risk between the two sub periods reveals that there is significant difference in correlations for six of the ten MENA countries with developed countries. But for two of the six countries the correlation is negative. These countries include Tunisia, Morocco, Lebanon, Jordan, and Egypt. It is possible that changes in legal and accounting systems as well as changes in economic policies and regulations have an impact on the increased integration in some of these countries.

IV. Summary and Conclusion

In this study we examined the notion that MENA market country equities are considered as a similar asset class to developed country equities. The results of the study partially supports the evidence of higher emerging market returns compared to the developed countries that has been documented in a number of studies. High returns were recorded only for some of the countries in the MENA region during the whole period of study. During the first sub period (1995-1999), there was a major increase in the risk level for most of the MENA countries. As a result, the risk adjusted return for all of the MENA countries (except Saudi Arabia) dropped below the risk adjusted return for UK, USA, and the world. During the second sub period (2000-2004), a major shift in the relative performance of developed countries and MENA countries occurred. Five of the MENA countries had high positive returns and outperformed the developed countries. The tragedy of September 11 may have had a distorting impact on returns and risks of the developed countries.

The correlation tests, on the other hand, show that capital market integration has accelerated in recent years, both economically and politically, but only for three countries in the MENA region. Therefore, we conclude that the MENA market countries should continue to be viewed as separate asset class from developed countries. These markets seem to be highly segmented and provide great diversification potentials to global investors. It is clear that a number of frictions and barriers still restrict MENA markets from being fully integrated, especially in the areas of legal enforcement and accounting standards. However, the steps towards liberalization of MENA capital markets, their increased openness, and the new developments in information technologies will have a positive impact on the degree of integration with other world's capital markets

Table 1. Summary Statistics: Descriptive Statistics for each Monthly Return Series

PANEL A: 1995.12 to 2004:12

	Obs.	Mean	Std. Dev.	Mean/Std Dev.	Skewness	Kurtosis	JB
Bahrain	70	0.54%	3.82%	14.136%	0.045	4.873	10.258
Egypt	106	0.11%	7.46%	1.475%	0.506	2.900	4.571
Israel	94	0.57%	7.51%	7.590%	-0.643	3.118	6.538
Jordan	238	0.52%	4.41%	11.791%	0.266	3.897	10.786
Lebanon	70	-0.50%	8.11%	-6.165%	0.319	3.543	2.046
Morocco	106	0.64%	4.94%	12.955%	-0.225	3.448	1.782
Oman	70	0.69%	5.75%	12.000%	0.588	3.797	5.890
Saudi Arabia	82	1.33%	4.73%	28.118%	-0.440	3.185	2.760
Turkey	214	0.85%	18.43%	4.612%	0.134	3.455	2.491
Tunisia	106	-0.74%	5.28%	-14.015%	0.028	6.214	45.626
ME Index	106	0.29%	5.85%	4.957%	-1.419	7.115	110.34
EM Index	238	0.60%	6.59%	9.105%	-0.946	5.881	117.826
Japan	237	0.45%	6.95%	6.475%	0.094	3.248	0.956
UK	237	0.76%	5.24%	14.504%	-0.341	4.652	31.553
USA	237	0.80%	4.54%	17.621%	-1.053	6.637	174.434
World	201	0.46%	4.21%	10.926%	-0.553	3.777	15.300

PANEL B: 1995:1 to 1999:12

	Obs	Mean	Std. Dev.	Mean/Std Dev	Skewness	Kurtosis	JB
Bahrain	12	0.28%	1.60%	17.500%	-0.82	4.85	3.056
Egypt	48	0.60%	7.63%	7.864%	0.92	3.48	7.177
Israel	36	1.30%	6.82%	19.062%	-0.26	2.23	1.295
Jordan	60	0.33%	3.51%	9.402%	0.43	2.76	2.010
Lebanon	12	-1.65%	11.73%	-14.066%	0.42	2.81	0.377
Morocco	48	1.62%	4.67%	34.690%	0.09	3.48	0.521
Oman	12	0.58%	9.72%	5.967%	0.48	1.97	0.991
Saudi Arabia	24	0.17%	5.44%	3.125%	0.07	2.25	0.582
Turkey	60	2.44%	16.93%	14.412%	0.25	4.98	10.422
Tunisia	48	-1.36%	6.45%	-21.085%	-0.01	5.30	10.545
ME Index	48	-0.41%	7.08%	-5.791%	-1.32	6.16	33.881
EMIndex	60	-0.11%	7.04%	-1.563%	-1.38	7.02	59.528
Japan	60	0.11%	6.25%	1.760%	0.20	2.38	1.358
UK	60	1.29%	3.16%	40.823%	-0.34	3.17	1.201
USA	60	2.02%	4.07%	49.631%	-1.44	6.58	52.913
World	60	1.31%	3.86%	33.938%	-1.43	7.33	67.441

Table 1 (continued). Summary Statistics: Descriptive Statistics for each Monthly Return Series

PANEL C: 2000:1 to 2004:12

	Obs.	Mean	Std. Dev.	Mean/Std Dev	Skewnes	Kurtosis	JB
Bahrain	60	0.59%	4.14%	14.251%	0.02	4.26	3.831
Egypt	60	-0.30%	7.35%	-4.082%	0.12	2.13	1.958
Israel	60	0.12%	7.93%	1.513%	-0.75	3.20	5.506
Jordan	60	1.24%	4.27%	29.040%	0.41	2.42	2.424
Lebanon	60	-0.26%	7.26%	-3.581%	0.35	3.32	1.431
Morocco	60	-0.17%	5.05%	-3.366%	-0.38	3.16	1.450
Oman	60	0.72%	4.67%	15.418%	0.58	4.03	5.757
Saudi Arabia	60	1.80%	4.36%	41.284%	-0.68	4.15	7.644
Turkey	60	-1.07%	18.17%	-5.889%	-0.45	3.18	2.052
Tunisia	60	-0.24%	4.04%	-5.941%	0.74	4.42	10.096
ME Index	60	0.88%	4.58%	19.214%	-0.92	3.86	10.044
EM Index	60	0.06%	5.64%	1.064%	-0.51	2.88	2.544
Japan	60	-0.87%	5.65%	-15.398%	0.29	2.13	2.602
UK	60	-0.43%	4.47%	-9.620%	-0.02	2.79	0.114
USA	60	-0.57%	4.84%	-11.777%	-0.10	2.65	0.380
World	60	-0.52%	4.58%	-11.354%	-0.27	2.60	1.046

Table 2.Correlations in Returns

Panel A: 1995-1999

	Bahrain	Egypt	Israel	Jordan	Lebanon	Morocco	Oman	Saudi Arabia	Turkey	Tunisia
Bahrain	1.00									
Egypt	0.25	1.00								
Israel	-0.08	0.17	1.00							
Jordan	-0.06	0.60	0.39	1.00						
Lebanon	-0.34	0.32	0.28	-0.06	1.00					
Morocco	0.27	0.22	-0.65	-0.02	-0.09	1.00				
Oman	0.45	0.14	-0.51	-0.25	-0.18	0.66	1.00			
Saudi Arabia	0.43	0.13	0.05	-0.10	0.07	0.11	0.06	1.00		
Turkey	0.24	0.31	0.56	0.50	-0.13	-0.34	-0.11	-0.09	1.00	
Tunisia	-0.20	-0.03	-0.41	0.27	-0.27	0.11	-0.28	-0.56	0.02	1.00
ME Index	0.77	0.34	0.45	0.18	0.02	0.10	0.15	0.56	0.36	-0.50
EMg Index	0.47	-0.05	0.55	0.02	0.19	-0.22	-0.06	0.45	0.23	-0.54
Japan	0.51	-0.03	0.24	-0.12	-0.25	0.07	0.15	0.68	0.25	-0.61
UK	0.72	0.23	0.29	0.36	-0.30	-0.10	0.01	0.37	0.65	-0.08
USA	0.57	0.44	0.35	0.20	0.27	0.11	0.04	0.38	0.06	-0.40
World	0.68	0.42	0.39	0.18	0.19	0.09	0.10	0.56	0.28	-0.49

Panel B: 2000-2004

	Bahrain	Egypt	Israel	Jordan	Lebanon	Morocco	Oman	Saudi Arabia	Turkey	Tunisia
Bahrain	1.00									
Egypt	0.47	1.00								
Israel	0.19	0.09	1.00							
Jordan	0.33	0.31	0.10	1.00						
Lebanon	0.10	0.31	0.09	0.05	1.00					
Morocco	0.16	0.31	0.26	0.23	0.30	1.00				
Oman	0.34	0.33	0.21	0.22	0.00	0.20	1.00			
Saudi Arabia	0.21	0.28	0.15	0.23	0.27	0.16	0.17	1.00		
Turkey	0.40	0.21	0.21	0.13	0.16	0.01	-0.18	0.18	1.00	
Tunisia	0.31	0.33	0.21	0.17	-0.06	0.17	0.31	0.12	0.08	1.00
ME Index	0.39	0.39	0.49	0.17	0.26	0.46	0.17	0.49	0.36	0.25
Emerging Index	0.50	0.41	0.33	0.30	0.19	0.31	0.04	0.35	0.64	0.18
Japan	0.30	0.38	0.19	0.09	0.20	0.36	0.22	0.34	0.30	0.04
UK	0.35	0.19	0.31	0.17	0.25	0.29	0.08	0.27	0.56	0.15
USA	0.30	0.18	0.41	0.16	0.28	0.17	-0.01	0.23	0.63	0.01
World	0.38	0.26	0.45	0.20	0.26	0.26	0.05	0.29	0.65	0.09

Panel C: Tests for significance in correlation difference in the two sub periods

Z test	Bahrain	Egypt	Israel	Jordan	Lebanon	Morocco	Oman	Saudi Arabia	Turkey	Tunisia
Middle East Index	-1.06	0.22	0.20	-0.04	0.67	**1.78**	0.06	-0.27	0.03	**3.76**
Emerging Index	0.08	**2.35**	-1.02	**1.50**	-0.02	**2.65**	0.29	-0.39	**2.21**	**3.59**
Japan	-0.58	**2.04**	-0.25	1.15	1.27	**1.45**	0.18	**-1.34**	0.26	**3.24**
UK	-1.02	-0.25	0.11	-1.01	**1.53**	**1.94**	0.19	-0.39	-0.47	1.15
USA	-0.74	-1.33	0.29	-0.25	0.03	0.35	-0.15	-0.59	**3.07**	**2.04**
World	-0.85	-0.80	0.31	0.11	0.18	0.89	-0.13	-1.03	**1.95**	**2.91**

Exhibit 1.Efficient Frontiers Sub-period Comparison

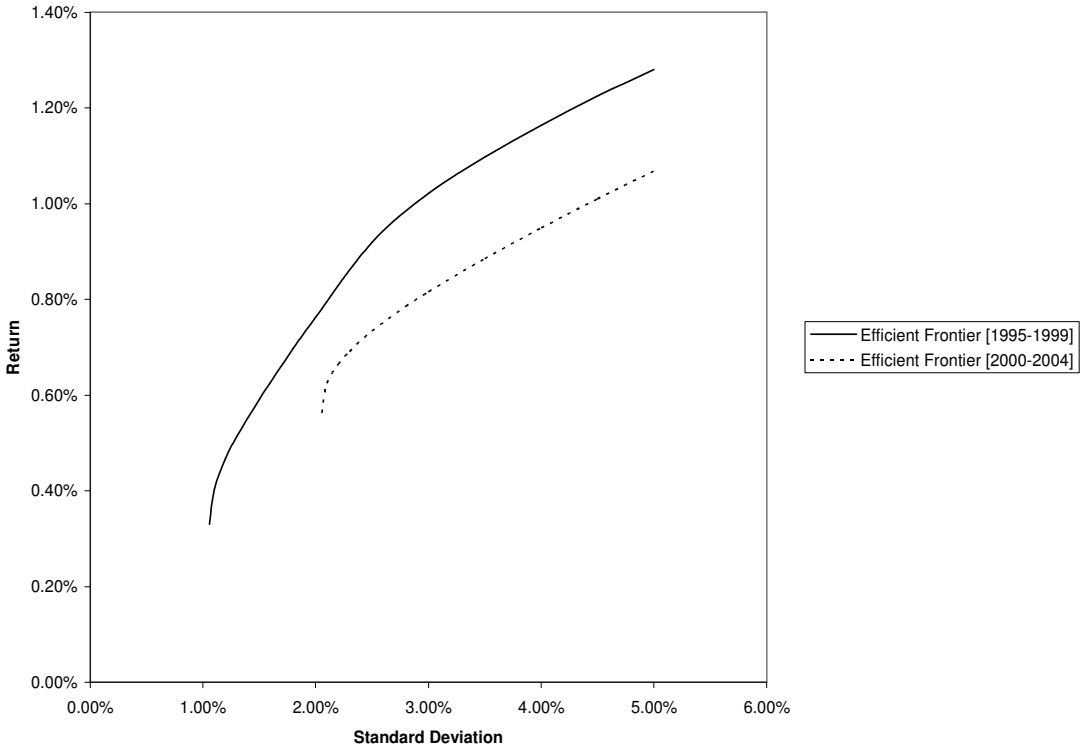

Table 3. Political Risk

Panel A: Correlations of Political risks

1995-1999	Bahrain	Egypt	Israel	Jordan	Lebanon	Morocco	Oman	Saudi Arabia	Turkey	Tunisia
Bahrain	1									
Egypt	0.23	1								
Israel	0.69	-0.05	1							
Jordan	0.57	0.40	0.50	1						
Lebanon	0.83	0.30	0.60	0.46	1					
Morocco	-0.09	0.67	-0.33	0.15	0.07	1				
Oman	-0.64	0.47	-0.76	-0.36	-0.46	0.63	1			
Saudi Arabia	0.09	0.05	0.25	0.24	0.26	0.12	-0.16	1		
Turkey	0.61	-0.22	0.60	0.30	0.69	-0.39	-0.71	0.18	1	
Tunisia	-0.65	0.40	-0.54	-0.09	-0.52	0.57	0.78	0.13	-0.68	1
Japan	-0.10	-0.55	0.07	-0.28	0.14	-0.35	-0.30	0.45	0.34	-0.24
UK	-0.73	0.25	-0.69	-0.39	-0.53	0.55	0.85	0.09	-0.73	0.83
US	-0.71	0.06	-0.81	-0.65	-0.54	0.31	0.80	-0.37	-0.54	0.48
2000-2004	Bahrain	Egypt	Israel	Jordan	Lebanon	Morocco	Oman	Saudi Arabia	Turkey	Tunisia
Bahrain	1									
Egypt	-0.56	1								
Israel	0.47	-0.08	1							
Jordan	-0.04	0.65	0.35	1						
Lebanon	-0.36	0.60	-0.16	0.53	1					
Morocco	0.67	-0.21	0.83	0.31	-0.30	1				
Oman	-0.35	0.60	0.08	0.45	0.46	0.09	1			
Saudi Arabia	0.37	0.15	0.08	0.43	0.51	0.07	0.19	1		
Turkey	0.21	-0.11	0.56	0.30	-0.03	0.52	-0.02	-0.16	1	
Tunisia	-0.87	0.72	-0.19	0.34	0.48	-0.32	0.61	-0.25	-0.02	1
Japan	0.81	-0.25	0.31	0.14	0.03	0.44	-0.16	0.65	-0.04	-0.65
UK	-0.61	0.63	-0.48	0.26	0.42	-0.61	0.29	0.21	-0.52	0.48
US	-0.84	0.83	-0.22	0.46	0.55	-0.43	0.59	-0.03	-0.12	0.87

Panel B: Significant Differences in Correlation of Political Risks

Ztest	Bahrain	Egypt	Israel	Jordan	Lebanon	Morocco	Oman	Saudi Arabia	Turkey	Tunisia
Japan	**4.81**	**1.57**	1.29	**2.21**	-0.56	**4.17**	0.74	1.06	**-2.04**	**-2.21**
UK	0.62	**2.04**	1.10	**3.41**	**5.04**	**-6.14**	**-2.95**	0.64	1.09	**-1.87**
US	-0.72	**4.07**	**3.10**	**5.88**	**5.80**	**-3.95**	-1.11	**1.78**	**2.25**	**2.08**

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