Business/Business Administration   Honors College

5-2012

Determinants of the Success of Active vs. Passive Investment Strategy

Richa Birla
University at Albany, State University of New York

Determinants of the Success of Active vs. Passive Investment Strategy

Richa Birla
University at Albany
Fall 2011

Abstract:
This study documents the monthly performance of active versus passive investing over the last 25 years. It also identifies several variables that are closely related to the current and next month's success of one over the other. Three useful factors identified include the Fed funds rate, the VIX volatility index, and Russell Investments' CrossVol™ index. All three are valuable in explaining and predicting the success of active management to certain extent.

INTRODUCTION

This study documents the monthly performance of active versus passive investing, and identifies the variables most closely related to the success of one over the other. Studies suggest that on average, investors are better served by using index mutual funds than actively managed funds. However, the results vary depending on which time period is examined. The motivation behind this study is to identify the economic factors that promote an environment conducive to stock picking success. With those factors identified both institutional and retail investors may be able to adapt their tactics and effectively time their decision related to active and passive investing.

LITERATURE REVIEW

Active investors buy and sell investments in order to exploit profitable conditions. On the other side, passive investors purchase investments with the intention of long-term appreciation and limited turnover. Depending on the term of the portfolio, under different circumstances, active and passive investments can serve different needs in the same portfolio. Though most evidence suggests that passive management outperforms active management, some studies suggest that truly active and skilled managers can and do generate returns above the market net of fees. (Goldman Sachs, 2010) The purpose of this thesis is to identify factors (variables) that are correlated with periods of higher active returns.

Different factors favor different types of investment strategies.

Fees and trading costs

In general, it has been shown that passive managers tend to perform better than the active managers. The high fees, expenses and trading costs related to active management of portfolio are responsible for lowering the returns. French (2008) compared the fees and the trading costs associated with active and passive management averaging over 26 years. According to French,

the average of the annual estimates for active fees over these years is 38.6 basis points which is eight times the average for passive, 4.8 basis points. Both passive and active costs decline over time. French concluded that active investors spend .67% of the aggregate value of the market each year chasing higher returns. Sharpe (1991) also suggested that active management cannot outperform passive management net of costs in the long term.

Market efficiency

Some industry professionals argue that investors who rely solely on low-cost index funds in their portfolios are missing advantages that active management can provide in some sectors of the market. However, the majority of active fund managers cannot beat the performance of benchmark indexes. It is believed, "The less efficient the market, the more potential there is for a manager to add value." In the current efficient market, the large cap companies are followed intensively by analysts and investors. So, it is difficult to catch any unexploited opportunities. On the other hand, emerging markets have fewer analysts and research. Active managers can provide an edge in the areas where there is less information such as small cap companies, international stocks and less liquid markets. Active investment on its own may not yield very high returns but a combination of active and passive management can help investors in maximizing their returns. (Mamudi, 2009)

Emerging Markets

As some of the developing countries are growing at an impressive rate, their stocks are also expected to offer superior value. A perception exists that in emerging markets, there are many opportunities to outperform. Therefore, why index? "When people think of emerging markets, they believe that there should be some sort of informational inefficiency there that would give active management an advantage. On the other hand, one of the problems with these markets is

that typically the stocks are fairly thinly traded, so trading costs can matter a great deal. That gives a bonus for passive investing." (Barnes, 2003)

Stock picking skills

It is believed that during some market environments, "stock pickers" in actively managed funds outperform indexers. Chen, Jegadeesh and Wermers (2008) investigated the value of active mutual fund management by examining the stockholding and trades of mutual funds. Based on the managers' stock picking skills, they compared the performance of growth-oriented funds and income-oriented funds. They found that there is only weak evidence that funds with best past performance have better future stock-picking skills than funds with the worst past performance. Therefore, it is difficult to predict the success of future gains based on the past performances for active managers.

On the other hand, Sorensen, Miller and Samak (1996) focused on the trade-off the typical pension fund faces in deciding how much to index. They analyzed the performance associated with various degrees of skill in various equity styles for 1985-1997. They presented the insights into the skill assumption embedded in the decision processes of pension fund managers and other investors. It was found that a modest amount of stock-picking skills goes a long way and that the optimal amount of allocation to indexing declines as skill increases. As a result, the success rate of future gains for passive managers is also difficult to predict.

Presidential elections

Presidential election years are considered favorable for stocks. According to Fisher (2011), most presidents' approval ratings rise in the months just before the elections and no president whose approval ratings were at 44% or above on Election Day have ever lost. Of the 21 election years since the S&P index began, 17 had positive stock returns. That's 81% and the average total

return during those election years was 10.9%. The process of presidential election increases optimism and boosts stocks which are more favorable for active investors than the passive investors in the short run.

Economic conditions

Certain economic conditions favor passive over active management and vice versa. According to Steverman (2011), during and after the economic crisis, bonds tend to do well in an environment of lower economic growth as compared to stocks because mutual fund managers focus on long-term investments rather than short-term. When the market is declining, stock managers focus on individual stock prices and see great bargains. He believes that sometimes there is a real disconnect between how the companies are doing and how the stocks are doing. In order to exploit that disconnect, active investors may end up losing.

According to Farrel (2011), an elevated risk premium for stocks may be a buy signal, but only if people think that future economic conditions will change and US will shake off its current economic difficulties. The premium is the additional return investors demand for owning stocks vs. bonds. In the 1970s and 80s, it was believed that owning stocks was less risky than bonds over the long haul. However, the poor performance of bonds largely reflected the impact of inflation. In the past, there had been a high average equity premium due to the perception of America's leadership in the world economy. However recently, the risk premium is running at a similar pace to major emerging markets. So, stocks may perform better than bonds due to a high risk premium but only in short term; thus, it may favor active investments over passive.

Tax-managed investing and Volatility

Tax-managed investing is where investors employ different strategies to minimize the tax consequences on their investment. "Tax consideration alone can boost a portfolio by an average

of 2.5% in net annual return." This is one of the areas where the active managers say that they have the advantage, especially in tough markets. As it is believed that market volatility tends to favor tax-managed investing. (Barnes, 2003)

According to Richard Cripps, chief market strategist for Legg Mason Wood Walker, "Investors don't like volatility, managers don't like volatility, and so they diversify and diversify and diversify their portfolio. However, by doing that, they're working against the opportunity that any individual sector, industry group, or stock can provide a better return than the market." Therefore, volatility is a necessary component of success and essential to generate high returns. As a result, sectors have been one place where active managers perform better than the indexers. (Barnes, 2003)

DATA

The data for this research are obtained from Morningstar and the Center for Research in Securities Prices (CRSP).The monthly returns of 47,479 funds are obtained from CRSP starting January, 1984 until June 2011. Morningstar is used to obtain the ticker symbols and fund names for those 47,479 funds.

Certain entries were deleted based on the following criteria:

- All funds obtained from CRSP are required to have a ticker symbol. 36,993 funds are left after the entries without the ticker symbol are deleted.

- The "Morningstar Category" column differentiates the funds as being a large or small capitalization and value or growth. This permitted the creation of four categories: "Large Growth," "Large Value," "Small Growth" and "Small Value". All other categories are deleted.

- The "Special Criteria" column in Morningstar data distinguishes between the active and passive funds (Index). All the funds that do not contain a "C" are deleted.   Listed under

Special Criteria (C), this indicates the funds with a distinct portfolio of securities. It conveys which share class to use if there are multiple share classes in a portfolio. After that all the funds that contain an "I" along with a "C" are also deleted. Special Criteria (I) represents an index. At last, 1,618funds are left.

▪ Out of 1,618 funds, 664 have either Russell 1000 or Russell 2000 Index listed as their primary prospectus benchmark. In order to prevent the survivorship bias, the Russell 1000 or Russell 2000 Index is used as a benchmark for all the funds regardless of their listed prospectus benchmark.

The breakdown of active funds in each category is shown in Exhibit 1.

Exhibit 1. Breakdown of active funds by category

Category	Number of funds
Large Growth (LG)	676
Large Value (LV)	454
Small Growth (SG)	339
Small Value (SV)	149

The passive funds/ Indices used for analysis are shown in Exhibit 2.

Exhibit 2: Passive funds/Indices

Ticker	Fund Name	Morningstar Category	Index*
TILIX	TIAA-CREF Funds: Large-Cap Growth Index Fund; Institutional Class Shares	Large Growth	RUSSELL 1000 Growth
TILVX	TIAA-CREF Funds: Large-Cap Value Index Fund; Institutional Class Shares	Large Value	RUSSELL 1000 Value
TISGX	TIAA-CREF Funds: Small-Cap Growth Index Fund; Institutional Class Shares	Small Growth	RUSSELL 2000 Growth
TISVX	TIAA-CREF Funds: Small-Cap Value Index Fund; Institutional Class Shares	Small Value	RUSSELL 2000 Value

*The returns used for passive funds are net of fees.

ANALYSIS

The average performance for actively managed funds is compared with the average for passively managed funds for each month starting January, 1984 until May, 2011 (329 months).

Based on the difference between the active and passive returns, it is determined whether a particular month is an active or passive success for each Morningstar category. If the difference is positive then it is considered an active success and vice versa. Exhibit 3 shows the proportion of active funds' success rate over passive funds for each Morningstar category.

Exhibit 3. Proportion of active funds outperforming passive funds by category

Category	Percentage of months
Large Growth	50.46%
Large Value	39.82%
Small Growth	61.40%
Small Value	47.72%

Chart 1 shows the yearly average of active returns minus passive returns difference from 1984 until 2010.

Chart 1: Yearly Active minus Passive returns Difference*
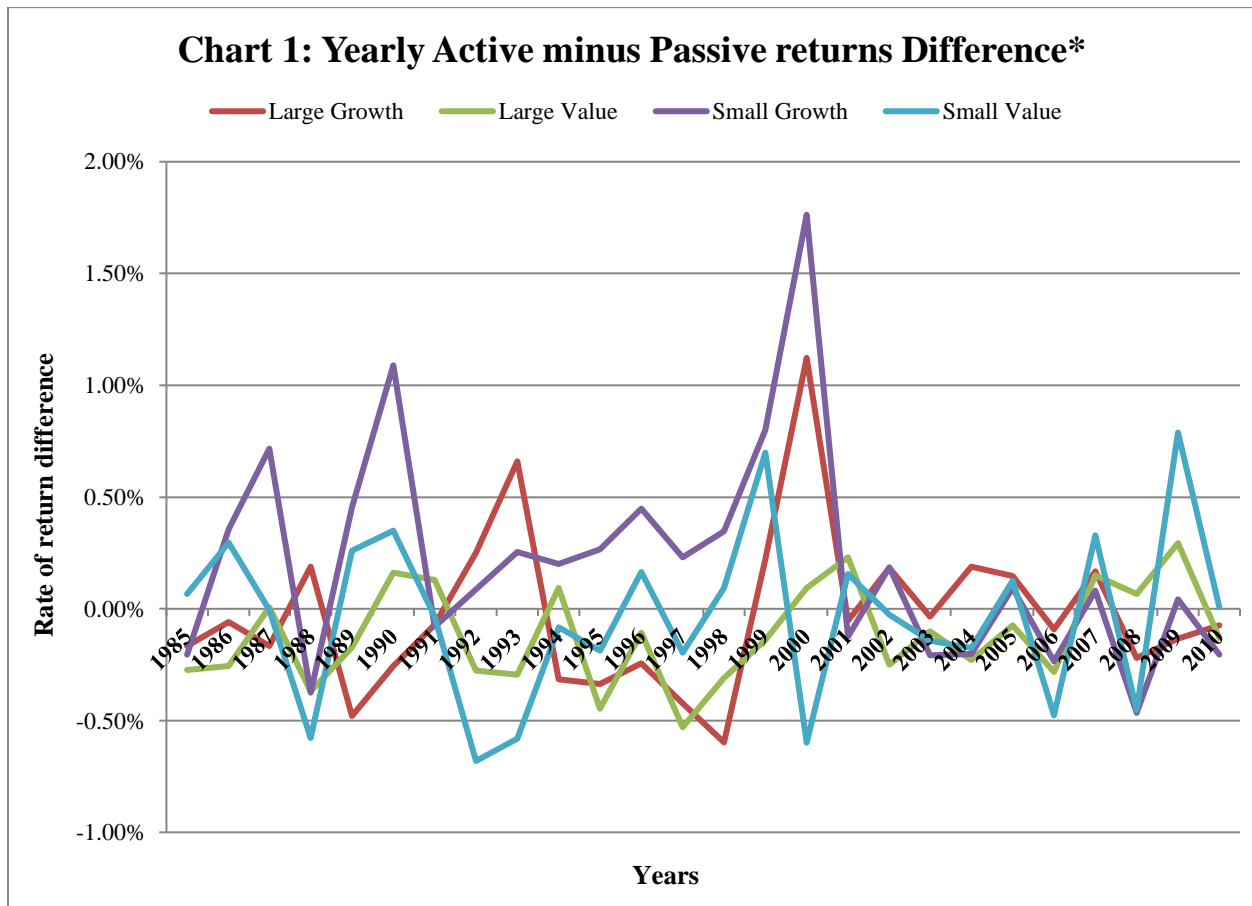
*If the difference is positive then passive returns trailed active returns.

Total net asset value (TNA) is used to determine the amount of gain or loss for each active fund at the end of each month starting January, 1985 until December, 2010. CRSP is used to get the year-end TNA values for 1618 active funds. Using the year-end values of prior and current year, the monthly values are interpolated. Passive returns are subtracted from active returns of each active fund for each month. The difference of returns is multiplied by each fund's TNA value for each month. The amount for all funds in a year is summed to obtain the amount gain or loss in that particular year. Overall, 50.6% of all months, passive trailed active.

Chart 2 shows the proportion of active funds gain over passive funds by category.
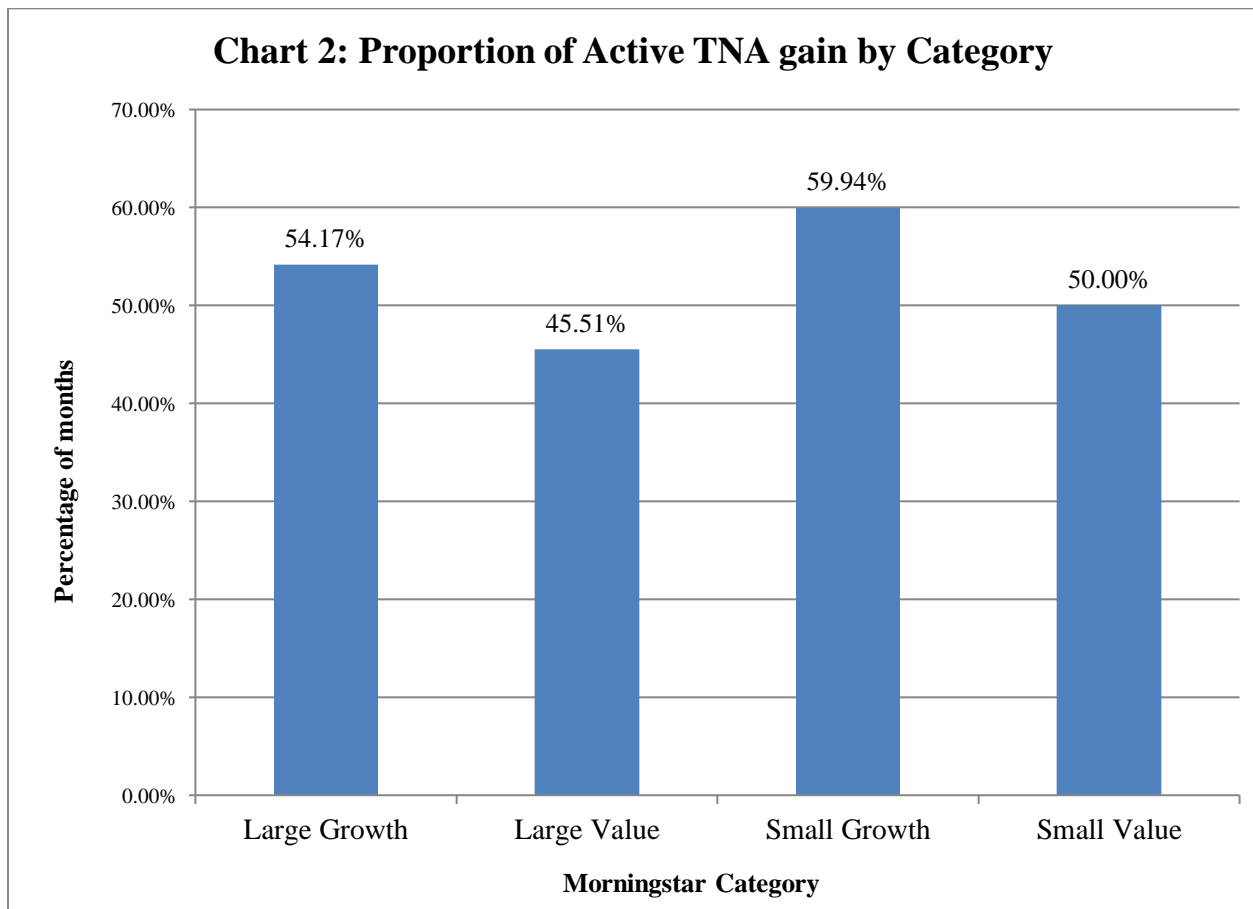
Chart 2: Proportion of Active TNA gain by Category

Exhibit 4 shows the amount of gain or loss in TNA by active funds over passive funds over last 25 years (1985 - 2010) by category.

Exhibit 4. Active funds' TNA gain or loss over Passive funds, 1985 - 2010

Category	TNA value
Large Growth	$161,968,465,785
Large Value	($25,689,012,460)
Small Growth	$33,638,829,421
Small Value	$4,475,434,311
Total	*$174,393,717,057*

Overall, the active funds have produced gains of $174 billion in last 25 years. Large value is the only category where active managers have lost wealth. On the other hand, large growth has generated the highest gain out of all the categories.

Chart 3 shows the yearly average of Total Net Asset value gained or lost by all active funds from 1985 – 2010.

Chart 3: Yearly Active TNA Gain and Loss for all Categories
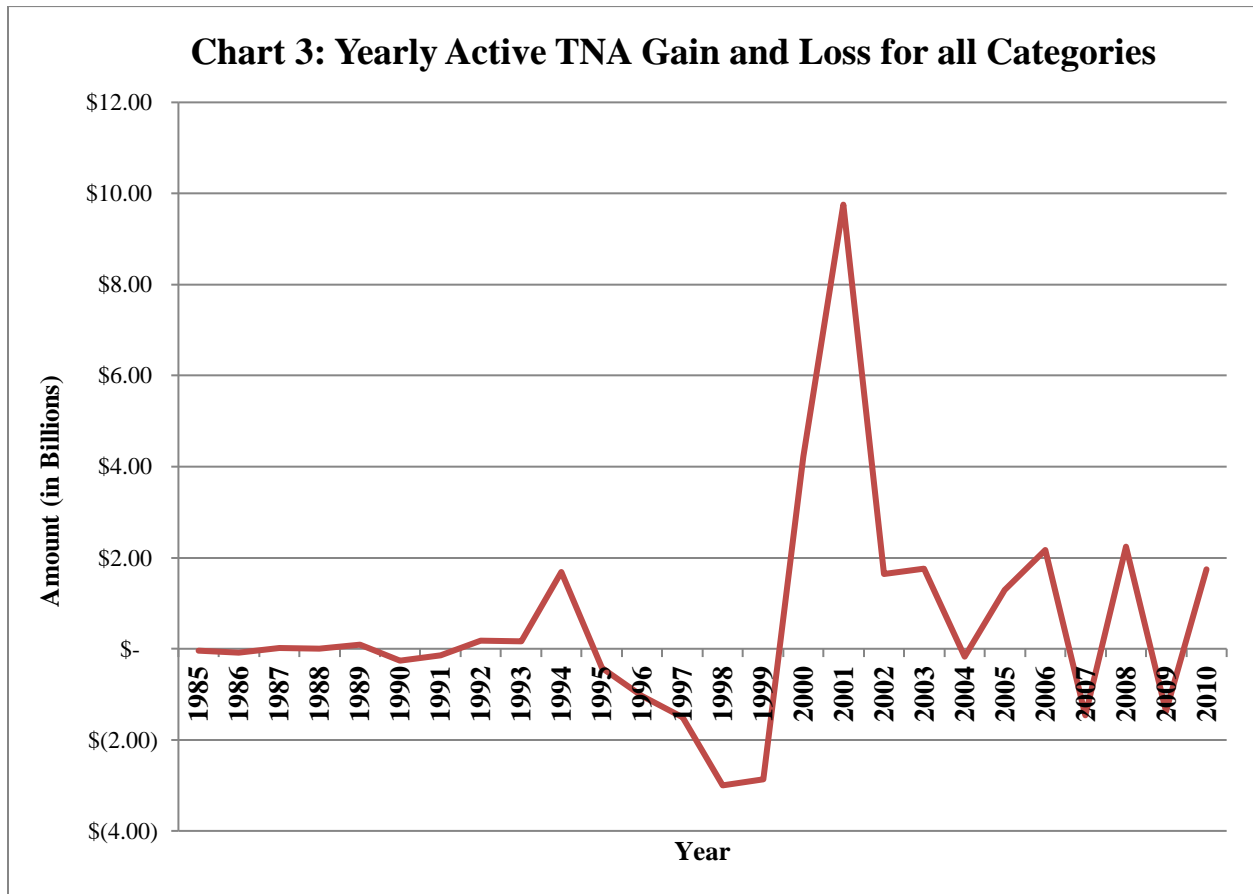
In 2000, active funds started gaining the TNA value over the passive funds and after its peak in 2001 it fell substantially. Since then the active funds' gain and loss has been consistent.

Regression Analysis:

Following is the equation used in regression analysis:

$$y = a + bx$$

There are two models in which two different y – variables are regressed on three explanatory factors.

Model 1:

Active minus Passive returns $= a + b *$ explanatory factors

In this case, the 4 passive funds' returns were subtracted from 1618 active funds' returns by category respectively. Then the differences obtained by subtracting two returns for each month are averaged. Exhibit 5 shows the different categories used in the regression analysis.

Exhibit 5. Active minus Passive categories

Active minus Passive (LG)	Average of Large Growth difference
Active minus Passive (LV)	Average of Large Value difference
Active minus Passive (SG)	Average of Small Growth difference
Active minus Passive (SV)	Average of Small Value difference
Active minus Passive (Average)	Average of all Active funds minus Passive funds regardless of category

Model 2:

Active Success $= a + b *$ explanatory factors

After the average for each month is obtained from Model 1, the success is determined for each category by month. If the average is a positive number then that month is considered an "Active Success" and if it is a negative number then it is a "Passive Success". To be able to use this variable in regression, the months with active success are given a "1" and passive success are given a "0".

Following are the categories:

i. LG Active Success
ii. LV Active Success
iii. SG Active Success
iv. SV Active Success

Explanatory Factors:

There are three explanatory factors used in this regression analysis:

1. Fed Funds Rate

The Fed Funds rate is the interest rate that U.S. depository institutions earn when lending to each other, usually overnight, on an uncollateralized basis. The monthly rates starting from January 1984 until December 31, 2010 are obtained from Federal Reserve Economic Data – St. Louis FED website.

U.S. Federal Reserve policy announcements and actions are scrutinized by market participants in an attempt to determine the impact policy actions will have on security prices. In particular, Fed charges that "tighten" monetary policy are frequently associated with relatively poor subsequent return performance, whereas changes that "loosen" monetary policy generally coincide with favorable market performance. It is believed that small companies have greater exposure to changes in monetary policy because they are generally less well collateralized than larger companies and thus be affected more by changes in credit conditions induces by Fed policy changes. Portfolios of small-cap stocks have economically and statistically significant monetary policy-related return patterns that are consistent over time. As a result, investment professionals are suggested to consider changes in monetary conditions while making strategic decisions. (Conover, Jensen, Johnson & Mercer 2005)

2. VIX Index

VIX is the name of the Chicago Board Options Exchange Market Volatility Index, a popular measure of the implied volatility of S&P 500 index options. Often referred to as the fear index or the fear gauge, it represents one measure of the market's expectation of stock market volatility over the next 30 day period. (VIX, 2011) Monthly VIX values starting from January 1, 1990 until December 31, 2010 are obtained from Yahoo finance.

The increase and decrease of the VIX shows individual investors the sentiment of larger financial institutions. It is believed that if the VIX is high, the underlying market is bearish and more investors are actually buying because they are expecting that the market will turn bullish and vice versa. (EToro Online Forex Trading, 2011)

3. Cross Volatility

Cross Sectional Volatility or CrossVol is an index series developed by Russell Investments and Parametric Portfolio Associates that measures the return dispersion of a universe of securities. The VIX monthly data is obtained from the Russell Investments from July 1996 until December 31, 2010.

According to Rolf Agather, Head of Index Research and Innovation at Russell Investments, "Cross-sectional volatility of the markets is an important determinant of the success of active management." As cross-sectional volatility increases, the payoff for an active bet increases. A good bet, for example, will pay off more with high CrossVol and less with low CrossVol. Similarly, the loss resulting from a bad bet will be more in periods of high CrossVol, but lower in periods of low CrossVol. According to Paul Bouchey, Director of Research at Parametric, "Through our work with Russell, we offer managers a better way to make sure the risk profile of

their portfolio is appropriate and allow investors to assess performance records and help them make more informed decisions." (Russell Investments, 2011)

The three explanatory factors were further divided into two factors each:

1. *Fed Funds Rate*

   i. Fed Funds Rate – The monthly Fed Funds rate are used in the regression.

   ii. Expansive or Restrictive Policy – If the Fed Funds rate increased then it is considered a restrictive policy and if it decreased then an expansive policy. Based on the policy, each month is assigned a "1" if it is an expansive policy and "0" if it is a restrictive policy.

Exhibit 6. t-Stat values obtained by regressing y-variables on Fed Funds rate

Variables	Fed Funds Rate		Expansive or Restrictive	
	Current Month[†]	Last Month's[††]	Current Month[†]	Last Month's[††]
Active minus Passive (LG)	-2.70***	-1.08	-1.14	-0.78
Active minus Passive (LV)	-4.02***	-0.67	-0.39	-0.63
Active minus Passive (SG)	-7.71***	2.64***	-2.54***	-1.15
Active minus Passive (SV)	-0.38	0.49	0.19	0.23
Active minus Passive (Average)	-7.18***	-0.32	-1.92*	-1.23
LG Active Success	-0.73	-1.88**	0.02	0.07
LV Active Success	-2.86***	0.45	-0.56	-0.76
SG Active Success	-6.27***	1.93**	-1.98**	-1.20
SV Active Success	-1.16	2.30**	-1.10	-0.82

*shows significance at 10% level
** shows significance at 5% level
***shows significance at 1% level
[†] Current month's y-variable values regressed on current month's Fed Funds rate
[††]Current month's y-variable values regressed on last month's Fed Funds rate to see whether this factor can help in predicting future results

Fed Funds rate has a negative correlation with current month's active returns. Large growth, large value and small growth for current month's t-Stat values show significance at 1% level. Overall, active returns t-Stat for all categories also shows significance at 1% level. On the other hand, when it comes to predicting future returns, only small growth's returns t-Stat value is

significant at 1% level which shows that Fed Funds rate can be helpful in predicting that difference between the active and passive returns will be higher in the coming months. Large growth, small growth and small value t-Stat are significant at 5% level. For next month's prediction, Fed Funds rate can help in determining whether active investing in these categories will outperform passive investing.

Expansive vs. restrictive policy is helpful in the current month to predict the difference between active minus passive returns in small growth category. However, it does not help in predicting next month's results.

2. *VIX Index*

    i. Adjusted Close Prices – The monthly adjusted close prices are used in the regression.

    ii. Open minus adjusted close prices – In order to see the difference in the VIX Index in a given month, the adjusted close price is subtracted from the open price and that difference is used in the regression.

Exhibit 7. t-Stat values obtained by regressing y-variables on VIX Index

Variables	Adj. Close Prices		Open minus Close Prices	
	Current Month[†]	Last Month's[††]	Current Month[†]	Last Month's [††]
Active minus Passive (LG)	-0.68	-1.55	1.71*	-1.08
Active minus Passive (LV)	2.73***	1.76*	1.04	-0.38
Active minus Passive (SG)	1.19	-1.29	4.68***	0.36
Active minus Passive (SV)	1.95**	1.35	0.74	-2.35**
Active minus Passive (Average)	1.31	-0.98	4.07***	-1.34
LG Active Success	-1.43	-1.56	0.30	-0.61
LV Active Success	2.50***	1.49	1.15	0.39
SG Active Success	0.59	-2.04**	4.84***	-0.51
SV Active Success	1.56	0.85	1.08	-0.52

*shows significance at 10% level
** shows significance at 5% level
***shows significance at 1% level
[†] Current month's y-variable values regressed on current month's Fed Funds rate
[††]Current month's y-variable values regressed on last month's Fed Funds rate to see whether this factor can help in predicting future results

VIX adjusted close prices show that large value is the only category in the current month that has a t-Stat that is significant at the 1% level. However, for next the month's prediction, the t-Stat for active minus passive returns in large value drops to 10% significance level. It shows that it is somewhat useful in predicting the next month's result only in the large value category.

On the other hand, VIX open minus adjusted close price difference tends to favor small growth and all the active funds in the current month. For future prediction, the t-Stat value for only small value is significant at 5% level. It is slightly useful in predicting the difference between active and passive returns in the coming month.

3. *Cross Volatility*

    i.   Cross Sectional Volatility – The monthly data is used in the regression.

    ii.   Above or Below Average – The cross sectional volatility for all the months between July 1996 and December 2010 are averaged, then this average is used to compare each month's volatility. If the volatility for a given month is above average then it receives a "1", and if it is below the average then it receives a "0".

Exhibit 8. t-Stat values obtained by regressing y-variables on Cross Volatility

Variables	Cross Volatility		Above or Below Average	
	Current Month[†]	Last Month's[††]	Current Month[†]	Last Month's[††]
Active minus Passive (LG)	1.64*	2.21**	-0.60	0.03
Active minus Passive (LV)	1.34	2.94***	0.34	1.22
Active minus Passive (SG)	0.08	3.59***	0.92	1.95*
Active minus Passive (SV)	0.11	2.45**	0.49	1.71*
Active minus Passive (Average)				
LG Active Success	-1.04	0.07	-2.34	-0.77
LV Active Success	1.17	2.63***	0.77	1.04
SG Active Success	-1.05	1.53	0.49	1.22
SV Active Success	-0.80	0.99	0.45	2.42**

*shows significance at 10% level
** shows significance at 5% level
***shows significance at 1% level
[†] Current month's y-variable values regressed on current month's Fed Funds rate
[††]Current month's y-variable values regressed on last month's Fed Funds rate to see whether this factor can help in predicting future results

In this case, t-Stat for all categories to predict next month's returns are highly significant, especially, large value and small growth that are significant at 1% level. Cross volatility has a positive correlation with the difference between the active and passive returns for all categories. This shows that cross volatility is the only factor in this study that is useful in predicting the coming month's returns for all categories.

Conclusion

Overall, passive investors beat the active investors in the majority of months examined. In this study, 50.6% of all months, passive trailed active. However, there are some market sectors where active investing outperformed the passive investing. For instance, in the case of large growth and small growth, active investors outperformed passive by 54.17% and 59.94% respectively. For small value, 50% of all months, active investors trailed passive investors. This shows that in small capitalization, active investors have potential to beat the passive investors.

However, in case of TNA, active investors in the large growth category gained $164 billion over passive investors which outperformed all other categories. Large value is the only category where active investing lost, totaling $25 billion. Overall, active investors gained $174 billion over passive investors in last 25 years, which shows that active investing does add value to the portfolio.

In a regression analysis, different factors are used to explain active minus passive returns. The Fed Funds rate tends to support the small growth category, which means as the current month's Fed Funds rate increases, the difference between the active minus passive returns for the next month in the small growth category also increases. It is also helpful in predicting next month's success for large growth, small growth and small value. Expansive and restrictive monetary policy is only helpful in predicting current month's active minus passive return difference for the small growth category.

As VIX adjusted close prices increase, the current month's active minus passive difference for large value and the large value success for current month increases. When compared with next month's result, it only helps in predicting the success for small growth category. VIX open minus adjusted close price is useful in predicting current month's active minus passive difference in small growth as well as overall and for success it again supports the small growth category. For next month's returns, it only helps in predicting active minus passive returns in small value category.

The current month's cross volatility is very helpful in predicting the next month's active minus passive returns for all categories. It is very important factor for active investors to analyze before making any investment decision.

Finally, on average, passive investing beats active investing. However, active investing does add value to the portfolio and in certain market sectors it tends to outperform passive. Fed funds rate and VIX index somewhat helps in predicting the current month and next future's trend but the cross volatility is a very important factor in predicting the next month's results. Therefore, investors must monitor these factors before making any investment decision.

References:

Barnes, Jonathan. "Active vs. Passive Investing." *CFA Magazine*. Jan 2003: 28-30. Print.

Chen, Hsui-Lang, Narasimhan Jegadeesh, and Russ Wermers. "The Value of Active Mutual Fund Management: An Examination of the Stockholdings and Trades of Fund Managers." *Journal of Financial and Quantitative Analysis*. 35.3 (2008): 342-368. Web. 6 Oct. 2011. <http://www.rhsmith.umd.edu/faculty/rwermers/jeg.pdf>.

Conover, Mitchell, Gerald Jensen, Robert Johnson, and Jeffrey Mercer. "Is Fed Policy Still Relevant for Investors?" *Financial Analyst Journal*. 61.1 (2005): 70-79

EToro Online Forex Trading. "VIX (Volatility Index) and Market Sentiments." EToro The World's Largest Online Forex Trading & Commodities Network. Web. 29 Nov. 2011. <http://www.etoro.com/education/vix-volatility-index-and-market-sentiments.aspx>.

Farrel, Chris. "U.S. Investing: Are the Best Times Over?" Bloomberg Businessweek. 27 Sep 2011. Web. 28 Sep 2011. <http://www.businessweek.com/finance/us-investing-are-the-best-times-over-09272011.html>.

Fisher, Ken. "Be Bullish even if Obama Wins." Forbes. 5 Oct 2011. Web. 5 Oct. 2011. <http://www.forbes.com/forbes/2011/1024/opinions-investing-bullish-obama-wins-republican-ken-fisher.html>.

French, Kenneth. "Presidential Address: The Cost of Active Investing." *Journal of Finance*. 63.4 (2008): 1537-1573. Print.

Goldman Sachs. "Re-thinking the Active vs. Passive Debate."Asset Management. 12 Nov 2010. Web. 1 Oct 2011. <http://www2.goldmansachs.com/gsam/docs/instgeneral/general_materials/perspectives/ps_fe-rethinking_the_active_vs_passive_debate.pdf>.

Jannarone, John. "Traders Seek Salvation from Correlation." Wall Street Journal. 29 Aug 2011. Web. 6 Oct. 2011

Mamudi, Sam. "Active vs. Passive: The Debate Heats Up." Wall Street Journal. 29 Aug 2009. Web. 21 Nov. 2011

Russell Investments. "Russell and Parametric launch joint index series that tracks cross-sectional volatility." Press Release. Web. 25 Nov. 2011. <http://www.russell.com/us/news/ press-release.aspx?link=press-releases/2010/PR20101018. htm>.

Sharpe, William. "The Arithmetic of Active Management." Financial Analysts Journal. 47.1 (1991): 7-9. Print.

Sorensen, Eric, Keith Miller, and Vele Samak. "Allocating between Active and Passive Management." *Financial Analysts Journal*. 56.5 (1996): 18-31.

Steverman, Ben. "Gloomy Bond Investors Clash with Upbeat Stock Managers." Bloomberg Businessweek. 5 Jul 2010. Web. 1 Oct. 2011. <http://www.businessweek.com/investor /content/jul2010/pi2010072_003534.htm>.

"VIX." Wikipedia, the Free Encyclopedia. Web. 25 Nov. 2011. <http://en.wikipedia.org/wiki/VIX>.