Morningstar Ratings and Performance of Mutual Funds

Partha Sarati Sinha

Bachelor of Business Administration, Shah Jalal University of Science & Technology, Sylhet, Bangladesh, 2005

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I dedicate this thesis to my parents, my wife and my daughter.

Abstract

In this study, we examine the predictive power of Morningstar's new ratings for mutual funds' future performance and compare its predictive power with four competing predictors. We also examine Morningstar's new ratings' predictive power in bull and bear periods. Furthermore, we compare the predictive power of the new and old star-ratings. We perform all these tests for both U.S. and Canadian equity funds. We use a regression model and non-parametric tests in this study.

The results suggest Morningstar's new ratings accurately rank funds and predict out-of-sample performance of only five-star rated complete funds for short- and medium-terms for U.S., and for medium-term only for Canada. Also, predictive power of Morningstar's new ratings is low compared to four alternative predictors for both countries. Further, the new star ratings accurately predicts for bear period for both markets. The old ratings (new ratings), however relatively predict better for U.S. funds (Canadian funds).

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1.0 Introduction

1.1: Prelude

Since the inception in the early 1920s in the United States, mutual funds[1] have become more popular day-by-day, and today they are more than a $24-trillion industry. No one expected mutual funds to become such a huge industry when the modern mutual-fund industry began operation in the United States in 1940 with assets of only $450 million. Although business researchers in the 1970s and 1990s predicted that mutual funds' growth would end soon, it is still a growing industry. It has become important for investors to understand the principles, pricing, and performance of mutual funds.

Morningstar and other rating agencies attempt to provide unbiased and authentic information for the complex financial facts of mutual funds. As a result, research has been conducted to identify the predictive power of the fund-rating agencies with competing predictors in the performance literature. The mutual-fund rating business has flourished from an optional and private rating service to a multimillion-dollar professional rating industry. Rating agencies provide a valuable service to both individual and institutional investors. Morningstar's star rating and the Lipper rating system[2] are the two most-used rating systems in the mutual-fund industry. Most mutual-fund companies such as Fidelity Investments, Vanguard Group, and Goldman Sachs use star ratings as the

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[1] "A mutual fund pools sums of money from investors, which are then invested in financial assets. Each mutual fund has its own investment objective, such as capital appreciation, high current income, or money market income" (Reilly, Brown, Hedges, & Chang, 2010, p. 47).

[2] In this study, we do not consider the Lipper rating system to evaluate the performance of mutual funds. Morey (2002b) conducted a study comparing the rating methodology and the predictive ability of ratings of three mutual-fund rating agencies. He compared Morningstar ratings, Value Line, and Lipper Analytical Systems and found that none of the rating systems were able to successfully predict winning funds. He found some weak evidence that the Value Line System predicts funds' future performance better than that of the Morningstar ratings. However, Morey's work is based on the old methodology of Morningstar. Comparing these fund-rating agencies to determine which one is a better predictor of funds' future performance is out of the scope of our study.

primary instrument to select ideal funds for specific investors (Guercio & Tkac, 2008; Sharpe, 1998).

Some studies (Goetzmann & Peles, 1997; Sirri & Tufano, 1998) have demonstrated that funds with high star rating attract larger cash inflow relative to the normal cash inflow. A study by Guercio and Tkac (2008) suggest that Morningstar has an independent influence on the decision-making process of the investors when selecting mutual funds. Also, Morningstar's risk-adjusted return measure seriously affects U.S. investors' attitude toward selecting and investing in the funds (Sharpe, 1998). As a result, we have selected the Morningstar as the primary rating agency to examine the predictive power of its rating system, and compare it to four alternative predictors.

Morningstar Inc. is one of the leading providers of independent investment research in the world. The company started its operations in 1984 and introduced its mutual-fund ratings in 1985. In June 2002, Morningstar made some important changes to their mutual-fund ratings methodology. Some studies of the predictive power of the Morningstar rating system find that Morningstar ratings better predict the out-of-sample performance of mutual funds than alternative predictors (i.e., the Sharpe ratio, the Jensen alpha, the four-index alpha), while other studies find the opposite. This inconclusive evidence motivates us to further extend the study. The purpose of this study is to add more evidence to the literature regarding whether or not Morningstar's ratings system could predict the future performance of funds.

Most existing studies focus on Morningstar's old methodology used prior to June 2002, with only two studies[3] examines Morningstar's new methodology for mutual-fund

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[3] Kräussl and Sandelowsky (2007) considered all Morningstar-rated U.S. funds. Gerrans (2006) used Australian Equity Funds.

rating. These studies mainly consider the U.S. domestic equity funds and no study has considered Canadian funds.

In the present study, we examine the predictive power of Morningstar's new star-ratings methodology and compare its predictive power with that of four alternative predictors. Furthermore, we perform a comparative analysis of the predictive power of the new star ratings in different economic conditions; a bull period and a bear period[4]. We also compare the predictive power of Morningstar's old and new rating methodologies in predicting funds' future performance. This study covers both U.S. and Canadian equity funds.

We examine ratings of equity funds for two reasons. First, this category of investment is the most popular with domestic investors. In the United States, domestic equity funds account to 35% of the $11.8 trillion mutual-fund industry (Reid, 2011). Second, previous studies such as Blake and Morey (2000) and Morey and Gottesman (2006) also used equity funds, which makes it convenient for us to compare our results with their findings. We include Canadian mutual funds (equity funds) in the study to compare the predictive ability of star ratings for two different countries.

We do not expect any significant differences in the predictive capacity of the star ratings for the U.S. and Canadian markets, as both countries have similar equity markets and mutual-fund industry rules and regulations, although the size of the mutual fund market is approximately 15 times bigger for the United States than that of Canada. Recent studies showed that the cost of mutual funds ownership between the United States and Canada are similar. The difference in price is mainly because of different fee

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[4] Positive monthly return for the market is the bull period and negative monthly return is the bear period (Fabozzi & Francis, 1979).

structures, value-added taxes, the scale of the business and different distribution structure (Harman, 2010; The Investment Funds Institute of Canada, 2012).

In the following subsections, we briefly discuss the mutual-fund industry as a whole - including Morningstar's star-rating methodology. We then provide a review of the literature underlying this study. Finally we outline the objectives of this study and its contributions to the literature.

1.1.1: Mutual-Fund Industry

Over the past few decades, the total amount of assets under management in the mutual-fund industry has increased dramatically. The Investment Company Institute (ICI)[5] reports that worldwide mutual-fund assets are $23.8 trillion as of December 2011, of which $11.6 trillion are United States mutual-fund assets. The U.S. mutual-fund industry is the largest in the world, accounting for 49% of mutual-fund assets worldwide at the end of 2011 (Reid, 2011). Approximately 88 million people in the United States invest in mutual funds (Haslem, 2003).

In Canada, as of December 2011, Canadian mutual-fund assets totaled $769.7 billion, and mutual funds and mutual-fund wraps[6] accounted for approximately 30 percent of Canadians' financial wealth (The Investment Funds Institute of Canada, 2011). The mutual-fund industry in Canada currently employs more than 90,000 people, both directly and indirectly, through fund-management companies (The Investment Funds Institute of Canada, 2011).

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[5] A national association of U.S. investment companies, including mutual funds, closed-end funds, exchange-traded funds, and unit investment trusts.
[6] "A mutual fund product or program that is set up to purchase other mutual funds rather than invest directly in underlying securities" (The Investment Funds Institute of Canada, 2011).

1.1.2: Morningstar, Inc.

Morningstar, Inc. is an independent investment research company based in

Chicago, Illinois.

> "Morningstar provides data on more than 385,000 investment offerings, including
> stocks, mutual funds, and similar vehicles, along with real-time global market data
> on more than eight million equities, indexes, futures, options, commodities, and
> precious metals, in addition to foreign exchange and treasury markets"
> (Morningstar, Inc., 2012).

Morningstar created the star-rating system to help individual investors and

mutual-fund companies understand the characteristics of their investments – the ups and

downs of a specific fund company and its management strategy. Morningstar operates

their business in 27 countries around the globe.

In 1992, Morningstar developed a tool called the "Morningstar Style Box"[7] to

help investors evaluate and choose mutual funds based on the fund's market

capitalization and the fund manager's investment style (for equity funds) or credit quality

and interest rate sensitivity (for bond funds). This Style Box is very useful in determining

how a mutual fund fits into a particular investment portfolio from an asset-allocation

perspective as well as from the individual's investment objectives (Investopedia, 2009;

Morningstar, Inc., 2004).

1.1.3: Star Ratings

Morningstar's star rating for mutual funds first appeared in 1985 (Morningstar,

Inc., 2012), and has been widely accepted by individual investors and financial advisors.

Morningstar rates funds from one to five stars[8] using a quantitative method based on their

past performance on the basis of the risk-adjusted return of each fund. The objective of

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[7] For details see Appendix B
[8] The best performers receive five star and the worst performers receive one star.

the rating is to provide an intuitive, rapid understanding of the relative performance of each fund for investors. Morningstar only rates funds that have at least three years' operations and rates them for three different time periods: three, five, and ten years. They also provide an overall rating for each fund based on the weighted average of these three time periods as specified in Table 1.

Morningstar originally provided star ratings in six broad asset classes. Then in 1996 they reorganized these six classes into four asset-class-based categories (Morningstar, Inc., 2012). These are U.S. equity funds, international equity funds, taxable bond funds, and municipal bond funds. In June 2002, Morningstar made additional changes in their star-rating system: first, to the rating group and second, to the calculation of risk-adjusted returns (Morningstar, Inc., 2008):

a) The Rating Group: As noted above prior to June 2002, Morningstar rated funds in four asset-class-based categories. In each of these categories there were a number of diversified share classes (for example A, B, I classes and so on). Each fund in each asset class received a star rating based on the criteria Morningstar used. Morningstar considered each share class as an individual fund in a multiple share class-funds and ranked them accordingly. As a result, the same funds belonging to different classes were assigned different ratings depending on the share class they belonged to.

One of the problems of this process is that it was very difficult for the investors to distinguish a particular fund from other funds, as they shared similar investment objectives within the same broad asset category. Additionally, if a fund had multiple share classes in each category, Morningstar used to count each share

class as separate fund, resulting in an increase of the number of funds in each asset

class. These multiple numbers of share classes for each fund influenced and

dominated the rating scale that caused some deficiencies in the ratings of funds.

To eliminate these weaknesses, in June 2002 Morningstar reorganized these

four broad asset classes into 65 Morningstar categories,[9] based on the fund's

specific investment objectives. Morningstar also made changes in the selection of

funds that had multiple share classes. Instead of considering all share classes, it

counted only one share class to calculate the ratings. If the fund did not change

from its investment category for the entire evaluation period, then the weights in

Table 1 were used to compute an overall star rating.

Table 1 Fund's Age and Weights on Morningstar Ratings[10]

Age of fund	Overall rating
At least 3 years, but less than 5 years	100% of 3-year Rating
At least 5 years, but less than 10 years	40% of 3-year Rating 60% of 5-year Rating
At least 10 years	20% of 3-year Rating 30% of 5-year Rating 50% of 10-year Rating

For example, to calculate the overall ranking of a fund "A", that was more than 10

years old, Morningstar put 20% weight on its three-year rating, 30% weight on its

five-year rating and 50% weight on its 10-year rating. If the fund changed[11] its

investment category, then Morningstar put less weight in the historical information

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[9] For details of Morningstar's categories see Appendix A

[10] Adapted from Benz (2005)

[11] Morningstar identified the magnitude of the changes for any fund (from zero to one), e.g., if a fund changes its investment category from Large Blend to Large Value then the degree of similarity is 0.50; or from Large Growth to Moderate Allocation then the degree of similarity is 0.25 (Morningstar, Inc., 2007).

of that particular fund. This change helped Morningstar to minimize the dominance a fund could acquire by changing its investment style.

b) The Calculation of Risk-Adjusted Returns: Prior to June 2002, Morningstar measured risk by a fund's average underperformance relative to the 90-day treasury bills. If a fund's monthly return surpassed the 90-day T-bill rate each month then that fund was considered to be riskless. Under this method a fund with a highly variable return[12] possibly make losses in the future, even though the fund had good returns earlier.

In June 2002 Morningstar enhanced its risk measurement by considering all variations in the funds' performance and putting more emphasis on downward variation. This change rewarded consistent performers and minimized the possibility of showing superior short-term performance while hiding the intrinsic risk of a fund.

These changes provided a better measure of risk which helped investors adjust the return and identify the top-performing funds. The risk-adjusted return is then adjusted for dividends, sales loads, and the risk-free rate (Morningstar, Inc., 2007). This risk-adjusted return is used as the benchmark for the Morningstar ratings.

Once Morningstar calculates the risk-adjusted return for all the funds in each category, the funds are then ranked based on the hierarchy of risk-adjusted return. Funds with the top 10% scores in each category earn five star. The next 22.5% get four star, the middle 35% receive three star, the next 22.5% get two star, and the bottom 10% receive one star (Benz, 2005).

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[12] Internet funds, for example, were performing very well in 1999-2000, but over the next few years, incurred huge losses (Morningstar, Inc., 2007).

1.2: Literature Review

Several studies[13] have been conducted to examine the predictive power of the Morningstar ratings for equity funds. Some of these studies find that Morningstar's ratings accurately predict funds future performance (e.g., Morey and Gottesman, 2006), while others do not (e.g., Blake and Morey, 2000; Gerrans, 2006; Kräussl and Sandelowsky, 2007; Sharpe, 1998).

The first section of the literature review summarizes findings concerning the predictive power of the old star rating method and compares its predictive ability to alternative predictors. The next section reviews the literature on the performance of the new star ratings. The result of studies comparing the predictive power between the old and new star-rating methods is presented in section three.

1.2.1: Old Star Ratings Methodology

Blake and Morey (2000) examine the predictive ability of the Morningstar ratings and compare its predictive ability with that of four alternative predictors for U.S. domestic equity funds, using data from 1992 to 1997. They use regression analysis and the Spearman-Rho rank correlation tests to perform the study over one, three and five year sample periods. To identify the predictive ability of the star ratings, Blake and Morey check whether the regression coefficients have the correct sign and are significant or not. They use Spearman-Rho rank correlation tests to examine the degree of association of the in-sample Morningstar ratings of the funds with the out-of-sample performance of these funds measured by four performance measures.

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[13] Morey (2002a) investigated the relationship between the old star ratings and age of funds and found that Morningstar's ability to select the winning funds is very limited. Adkisson and Fraser (2003) also examined the age bias in the new star-rating system. Their results suggested that changes in the methodology significantly strengthened the new star-rating system. However, this new star rating still has the age bias, implying the predictive power of the new star rating is also limited.

Their results from the regression analysis show that most of the coefficients are negative and significant for one- and two-star rated funds, but they are not for three- and four-star rated funds. This implies that the predictive power of the Morningstar ratings is better for one- and two-star rated funds compared with three- and four-star rated funds. Furthermore, the coefficients for the five-star rated funds are not always significant, implying there is weak evidence that the top-rated funds always outperform other funds. They also find that the regression coefficients are not always increasingly negative and significant from higher- to lower-rated funds, implying the lower-rated funds do not always underperform than the higher-rated funds.

To perform the correlation test, they divide the sequentially arranged rank data (both in-sample and out-of-sample) into decile. The results show that the correlation between the in-sample Morningstar ratings and out-of-sample ranking by performance measurement is low, on average, implying poor predictive ability of Morningstar ratings. However, the correlations are much larger for bottom five deciles compare with top five deciles, indicating Morningstar ratings better predict lower-rated funds relative to higher-rated funds.

They used short-, mid- and long-term sample periods to identify the effect of period length on predictive ability. Their results show that the predictive ability of the star ratings is similar over different time periods.

Blake and Morey also compare Morningstar ratings' predictive power with four alternative predictors: the Sharpe ratio, the Jensen alpha, a four-index alpha and a 10-year mean monthly return. Their regression analysis suggest that on average Morningstar ratings predict future performance better than the Jensen alpha and four-Index alpha, but

predict worse than the Sharpe ratio and 10-year mean monthly returns. Rank correlation tests also show low correlations between the Morningstar ratings and four-index alpha or 10-year mean monthly return, and high correlations between Morningstar and the Sharpe ratio.

Sharpe (1998), on the other hand, compares Morningstar's risk-adjusted ratings with the ratings from the excess-return Sharpe ratio theoretically. He finds that neither method is an efficient tool for choosing the right mutual funds within a comparison group for a multi-fund portfolio. However, he suggests Morningstar's ratings are better for investors who invest all of their money in one fund without leverage, while the Sharpe ratio is better when they invest in one fund with leverage.

Gerrans (2006) look at the relationship between Morningstar's fund ratings and funds' future performance for the Australian Equity Trust using data from August 1996 to February 2001. This study considers only the predictive power of Morningstar ratings for different-rated funds. Like Blake and Morey (2000), he uses regressions to identify the predictive power of Morningstar ratings. His results[14] show that most of the regression coefficients do not have correct signs and are not significant, implying that the Morningstar ratings do not predict funds' performance well (i.e., for five-, four-, three-, two-, one-star rated funds). However, there are some evidences that the lower-rated funds perform worse than five-star rated funds, implying that the Morningstar ratings predict lower-rated funds in some cases, which also correspond with Blake and Morey (2000). These results are robust to sample size and performance measures.

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[14] Results show that the relationship between Morningstar ratings and funds' future performance is mostly negative.

In summary, from the above discussion we find that Morningstar's old rating method at times predicts the future performance of lower-rated funds. However, there is no significant difference among the future performance of five- , four- and three-star rated funds. Also, the predictive ability of the old star ratings is mixed compared to those of the alternative predictors.

1.2.2: New Star Ratings Methodology

Morey and Gottesman (2006) investigate the predictive power of the new star ratings for U.S. domestic equity funds using data from July 2002 to June 2005. They also look into the predictive power of the star ratings using regression model similar as Blake and Morey (2000). Their results suggest that in most cases regression coefficients have the correct sign and are significant, indicating the Morningstar's new ratings accurately rank funds and predict the funds' future performance for all funds. They also find that, in most cases, the coefficients of the test of differences in coefficients are negative and significant (i.e., all of them are increasingly negative), implying the higher-rated funds perform significantly better than the lower-rated funds. However, they do not compare the predictive power of Morningstar's new ratings with those of alternative predictors.

Morey and Gottesman (2006), however, use only three years of monthly return data, making it difficult to draw conclusions about predicting the long-term performance of funds. It is important to note that Morningstar place more emphasis on the long-term risk-adjusted return of a specific fund when they announce the star ratings depending on the age of the funds.

1.2.3: Comparison of Old and New Star Rating Methods

Kräussl and Sandelowsky (2007), examine the predictive performance of the Morningstar ratings for all Morningstar-rated U.S. mutual funds[15] using data from March 1995 to September 2005. This study covers seven years of old methodology rated funds and three years of new methodology rated funds. They also compare the predictive ability of the old and new star ratings using regression model.

First, they consider the entire sample period (10-year) in a single group. Their results show that most of the regression coefficients are negative and significant for the lower-rated funds; implying star ratings accurately predict the future performance of two- and one-star rated funds. But for middle- and top-rated funds the sign of the coefficients are not always correct and significant indicating star ratings' predictive power is mixed for three-, four-, and five-star rated funds.

Next, they consider the seven years of old methodology rated funds. Their results show that only half of the regression coefficients (45% cases) have correct sign and are significant for the lower-rated funds and only one fourth of the regression coefficients (25% cases) have correct sign and are significant for the higher-rated funds, indicating that the predictive accuracy of old star ratings is limited. These results correspond with the Blake and Morey's study. The predictive ability of the old star ratings deteriorates further when they move from short-term to long-term sample periods.

Last, they consider the three years of new methodology rated funds. The results of this analysis show that, less than one fifth of the regression coefficients (20% cases) have the correct sign and are significant for lower-rated funds and for higher-rated funds it is

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[15] All of the Morningstar rated U.S. funds were composed of four broad categories for the old Star ratings and 64 of categories for the new star ratings. They used a total of 25,202 funds.

less than 10% of the cases implying the predictive power of Morningstar's new ratings declined compared to the old ratings. However, these findings contradict with those of Morey and Gottesman (2006).

To summarize the above discussion, some studies find that the old ratings accurately predict the performance of lower-rated funds (Blake & Morey, 2000), while other studies do not (Kräussl and Sandelowsky, 2007; Gerrans 2006). One study finds that Morningstar's new ratings accurately predict the future performance of all funds (Morey & Gottesman, 2006), while another study[16] show that the new star rating does not predict well for any of the funds (Kräussl & Sandelowsky, 2007). Also, previous studies do not show any clear evidence of superior predictive power for Morningstar ratings relative to alternative predictors.

1.3: Objectives of the Study

The above studies used U.S. fund data except for one study that used the Australian data. To the best of our knowledge, there is no published study for the Morningstar ratings for Canadian mutual funds listed in the S&P/TSX Composite Index.

This study is an attempt to fill the gaps in the literature in the following ways:

- It includes both U.S. and Canadian equity funds using both the old and new star rating system,

- It considers the comparative performance of the new star ratings with alternative predictors for both U.S. and Canadian market, and

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[16] These two studies use similar methodology i.e., regression analysis to identify the predictive power of star ratings. But Morey and Gottesman (2006) use only U.S. domestic equity funds while Kräussl and Sandelowsky (2007) use all of the Morningstar rated U.S. funds (i.e., four broad categories for the old Star ratings and 64 of categories for the new star ratings).

- It examines the predictive power of the new star ratings in different economic conditions, i.e., bull vs. bear periods.

We conduct the study in the following sequential manner. In particular, we:

I. investigate the predictive power of Morningstar's new ratings system for mutual funds for both U.S. and Canadian equity funds,

II. compare the predictive power of Morningstar's new ratings system to that of four alternative predictors; the Sharpe ratio, Jensen alpha, the four-index alpha, and the information ratio,

III. examine the predictive power of Morningstar's new ratings system for bull and bear periods for both U.S. and Canadian equity funds, and

IV. compare the predictive power of the old and new star-rating methodologies for both the U.S. and Canadian markets.

The remainder of the thesis is organized as follows: Chapter 2 discusses the data and the methodology that we have used for the analysis; Chapter 3 presents and discusses the results of the study; and Chapter 4 provides the summary and concludes.

2.0 Data and Methodology

2.1: Data

In this study, we use monthly return data for equity funds from the Morningstar Direct Database[17] for the United States from July 1992 to June 2011 and for Canada from July 1992 to December 2009. The shorter time frame for the Canadian data is due to the unavailability of four-index alpha data[18]. We use different data sets depending on the objectives of the study which are described in detail in the relevant sections of this chapter.

We use only open-ended mutual funds data since funds need to be open when they are rated by Morningstar (Blake & Morey, 2000). From the new methodology rated data set, we obtain 9,870 U.S. equity funds and 1,989 Canadian equity funds. After identifying the funds, we narrow down our sample by eliminating the duplicate funds[19] following the procedure of Morey and Gottesman (2006). To select one share class from the multiple share classes we identify the fund share class with its earliest inception date (i.e., the fund with oldest share class). We select[20] either the share of class A or class B or no load funds for U.S. funds (although there are other kinds of share classes such as C class, I class, R class, S class, or Z class). The corresponding funds for Canada[21] that we

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[17] Morningstar Direct unites global investment data and content with tools for highly customized investment analysis (Morningstar, Inc., 2012).

[18] We have the Canadian data for four-index alpha (i.e. Small Minus Big, High Minus Low and Price Momentum) only till December 2009.

[19] These funds are identical to another fund in the sample, except they are sold as a different share class.

[20] We select only these share classes to compare our results with the previous studies of Blake and Morey (2000) and Morey and Gottesman (2006) and to find out the actual predictive capacity of Morningstar ratings with a more robust sample.

[21] The share-class type of Canadian mutual-fund industry is a little different than that of the United States, e.g. in the United States, Share Class A represents front-end load funds and Share Class B represents back-end load funds. But in Canada, Share Class E could be front-end load whereas Share class B could be no-load funds.

select for the study are front-end load, back-end load, either front-or back-end load,[22] and no-load funds.

Some funds have had name change, a merger, or both, or liquidation. We label these funds "problem funds." To handle these problem funds we follow a procedure similar to as that of Blake and Morey (2000).

2.1.1: Problem Funds

If we include only funds that have survived for the entire sample period and exclude the problem funds from the sample, then our study would have introduced a survivorship bias[23] problem. If we cannot address the survivorship bias problem, it influences the accuracy of the tests of the predictive power of the rating systems (Elton, Gruber, & Blake, 1996a).

To identify the fund name changes we use the Morningstar Direct database and the Morningstar Fact Sheet. Then we simply follow the monthly returns for the newly named funds with the returns under the old name (Blake & Morey, 2000).

For the merged or liquidated funds, we first use the Morningstar database to identify the month of the fund's name change. Up to that month we simply use the out-of-sample monthly return for the funds. But after the funds merge or liquidate, we assume that the investors randomly reinvest[24] into one of the other surviving funds in the same Morningstar category. So the out-of-sample return from the month of the merge or liquidation onward is the equally weighted monthly averages of the returns of all the

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[22] For this type of fund investors can choose either front-end or back-end load.

[23] The survivorship bias problem was described by Brown, Goetzmann, Ibbotson, and Ross (1992) and Elton, Gruber, and Blake (1996b).

[24] The rationale behind the assumption of random reinvestment as described by Blake and Morey (2000) is that, their study was examining the predictive power of Morningstar ratings, not only for superior performance but also for inferior performance.

other surviving funds in our sample within the same Morningstar category (Blake &

Morey, 2000; Morey & Gottesman, 2006).

Now we discuss in more detail the sample data groups, load-adjustment process

of the monthly return data, and the methodology and statistical tools that we have used

for the study.

2.1.2: Sample Data Groups

We divide our sample data into two broad groups, complete funds and periodic

funds, to examine the predictive power of the Morningstar ratings in different time

periods. The details about the number of these funds are presented in Table 2.

For the complete funds, we select only those funds that have an overall rating on

July 1, 2002. The total number of funds in this group available for analysis is constant -

768 for the United States and 176 for Canada. We conduct one-year, four-year, and nine-

year (U.S.) or seven-and-a-half-year (Canada) (short-term, medium-term and long-term)

out-of-sample analysis for each of the performance measures with these 768 and 176

funds using their in-sample monthly returns. We use July 2002 to June 2003 in-sample

monthly return data for the calculation of the one-year Sharpe ratio, information ratio,

Jensen alpha, and four-index alpha (i.e., performance measures); July 2002 to June 2006

data for four-year and July 2002 to June 2011 (U.S.) or December 2009 (Canada) data for

the calculation of nine-year or seven-and-a-half-year performance measures.

For the periodic funds, we select only those funds that have an overall

Morningstar rating on July 1 of each consecutive year from 2002 to 2010. As a result,

the total number of funds available for analysis in this group would rise each year, as new

funds would meet the eligibility criteria to be added into the sample group.

For example, if we use July 2002 ranked funds for a nine-year analysis of the periodic funds for the United States, then we use the in-sample monthly return data from July 2002 to June 2011 for 768 funds. On the other hand, if we use the July 2005 ranked funds for a four-year analysis, then we use the in-sample monthly return data from July 2005 to June 2009 for 1,005 funds. For a one-year analysis, if we use July 2009 ranked funds, in that case we use in-sample monthly return data from July 2009 to June 2010 for 1,266 funds. A similar procedure is used for selecting and examining Canadian funds.

Table 2 Summary Table of Number of Funds Used to Measure the Predictive Power of Morningstar Ratings

Types of funds	Rating time	United States			Canada		
		Nine years	Four years	One year	Seven & a half years	Four years	One year
Complete funds	July 2002	768	768	768	176	176	176
Periodic funds	July 2002	768	768	768	176	176	176
	July 2003		853	853		200	200
	July 2004		946	946		226	226
	July 2005		1,005	1,005		245	245
	July 2006		1,060	1,060			282
	July 2007		1,126	1,126			302
	July 2008			1,194			375
	July 2009			1,266			
	July 2010			1,323			

 2.1.3: Load Adjustment

Morningstar uses a load-adjusted monthly return to calculate star ratings. If we use the monthly return data without the load adjustment, then the returns on load funds would be overstated and our analysis of the predictive ability of fund ratings would be biased.

To adjust the monthly return for loads[25] of each of the funds we use a procedure similar to Blake and Morey (2000), Morey (2002b), and Morey and Gottesman (2006). For both front-end load and back-end load, we consider an investor who buys and holds the load funds for a fixed number of months. For the United States these are 12 months (one year), 48 months (four years) and 108 months (nine years) and for Canada it is 12 months (one year), 48 months (four years) and 90 months (seven and a half years).

Front-end load: For front-load adjustments, we assume that investors borrowed the necessary funds and paid the total load or sales charges for a specific fund at the time of purchase. Investors are paid this borrowed amount plus the loan-interest charge in equal monthly installments (annuities) that would spread across the holding period for that fund (Rea & Reid, 1998). Mathematically, we use the following front-end load adjustment mechanism (Blake & Morey, 2000; Morey & Gottesman, 2006):

$$f^m = \frac{f}{\sum_{j=1}^{h}(1+r)^{-j}} \qquad (1)$$

where f^m is the monthly front-end load adjustment, f is the front load for a particular fund (expressed as a percentage), h is the number of months the fund is held, and r is the monthly interest rate (monthly average of the one-, four-, and nine-year treasury yield for United State and one-, four-, and seven-and-a-half-year treasury yield for Canada).

The front-end load adjusted return for a specific fund is the (Blake & Morey, 2000; Morey & Gottesman, 2006):

$$R_{it}^{FLA} = R_{it} - f^m \qquad (2)$$

where R_{it}^{FLA} is the monthly front-end load adjusted return of fund i in month t and R_{it} is monthly return of fund i in month t.

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[25] We collect the load data of Canadian funds from http://www.fundata.com/ as Morningstar does not provide load data for Canadian funds.

Back-end load: The deferred-load adjustment process is different, because the load payment to the funds by the investors would not occur until the end of the holding period. To convert the deferred load into a monthly payment, we assume that investors would prepay the sales charges in equal monthly installments that reflect the deferred load less the interest earned on the prepayment. The following is the mathematical calculation for the monthly deferred load adjustment (Blake & Morey, 2000; Morey & Gottesman, 2006):

$$d^m = \frac{d}{\sum_{j=1}^{h}(1+r)^j}$$

(3)

where d^m is the monthly deferred-load adjustment, d is the deferred-load for a particular fund (expressed as a percentage), h is the number of months the fund is held, and r is the monthly interest rate (the monthly average of the one-, four-, and nine-year treasury yield for the United State and one-, four-, and seven-and-a-half-year treasury yield for Canada).

The deferred-load adjusted return for a specific fund is then (Blake & Morey, 2000; Morey & Gottesman, 2006):

$$R_{it}^{DLA} = R_{it} - d^m$$

(4)

where R_{it}^{DLA} is the monthly deferred-load adjusted return of fund i in month t, and R_{it} is the monthly return of fund i in month t.

We reduce the amount of the deferred-load adjustment as the holding period increases, because Morningstar also reduces it. As a result, the deferred load for a fund for 12 months is fully imposed, for 48 months it is half the amount, and for 108 or 90 months the deferred load is zero.

2.2.: Methodology

To measure the out-of-sample performance of the funds we use four different risk-adjusted performance measures: the Sharpe ratio (Sharpe, 1966), Jensen alpha (Jensen, 1968), four-index alpha (Carhart, 1997) and the information ratio (Goodwin, 1998). We use these four risk-adjusted performance measures because they are all well-known portfolio performance measures, and three of them (i.e. the Sharpe ratio, Jensen alpha, and four-index alpha[26]) have been vastly used in the previous literature. We utilize the information ratio as the fourth performance measure because Goodwin (1998) claims that the information ratio is a powerful instrument for evaluating the skills of a fund manager and the best single measure of the mean-variance characteristics of portfolios.

We then use two statistical techniques to examine the predictive power of the Morningstar ratings and that of the four alternative predictors: regression analyses and Spearman-Rho rank correlation tests.

2.2.1: Four Performance Measures

Now, we discuss the four performance measures used to calculate the out-of-sample performance of each fund for both load adjusted and non-load adjusted monthly return data.

The Sharpe ratio measures the risk premium (excess return) earned per unit of total risk. The load-adjusted Sharpe ratio for fund *i* for the out-of-sample period is (Blake & Morey, 2000; Morey & Gottesman, 2006; Reilly, Brown, Hedges, Chang, 2010; Sharpe, 1966):

$$Sharpe_i = \frac{\overline{R_i^{LA}} - \overline{R_{ft}}}{\sigma_i} \tag{5}$$

---

[26] Elton, Gruber, and Blake (1996a) argue that the four-index alpha accounts for all influences of the mutual funds better than the single-index alpha.

where $\overline{R_i^{LA}}$ is the average load-adjusted monthly return for portfolio i, $\overline{R_{ft}}$ is the average rate of return on a risk-free investment during the out-of-sample period (30-day T-bill rate) for portfolio i, and σ_i is the standard deviation of the load-adjusted monthly returns for fund i.

Jensen alpha measures the expected return on a portfolio or mutual funds. The alpha value designates the performance of the fund manager, whether the performance of the fund manager is superior or inferior. The load-adjusted single-index Jensen alpha for fund i for the out-of-sample period (Blake & Morey, 2000; Jensen, 1968; Morey & Gottesman, 2006; Reilly et al., 2010) is given by:

$$R_{it} - R_{ft} = \alpha_i + \beta_i [R_{mt} - R_{ft}] + e_{it} \tag{6}$$

where α_i is the Jensen alpha, β_i is the systematic risk, R_{it} is the monthly return, R_{ft} is the risk-free rate,[27] R_{mt} is the market return (S&P 500 and S&P/TSX Composite Index[28]), and e_{it} is the random error.

Four-index model uses beta, valuation, size, and momentum to measure the expected return from diversified portfolios. The load-adjusted four-index alpha for fund i for the out-of-sample period (Carhart, 1997; Morey & Gottesman, 2006; Reilly et al., 2010) is presented by:

$$R_{it} - R_{ft} = \alpha_i + \beta_{i1} [R_{mt} - R_{ft}] + \beta_{i2} SMB_t + \beta_{i3} HML_t + \beta_{i4} MOM_t + e_{it} \tag{7}$$

where α_i is the four-index alpha, β_i is the systematic risk, R_{it} is the monthly return, R_{ft} is the risk-free rate, R_{mt} is the market return (S&P 500 and S&P/TSX Composite Index),

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[27] We use treasury bill yield as our proxy for risk free rate, collecting the data for monthly treasury bills yield from the U.S. Department of the Treasury (http://www.treasury.gov/Pages/default.aspx), the Bank of Canada (http://www.bankofcanada.ca/about/), and Morningstar Direct.
[28] We collect the monthly market return data for the S&P 500 and the S&P/TSX Composite Index from Morningstar Direct.

SMB_t is the difference between the return of a portfolio of small and large capitalization stocks[29], HML_t is the difference between the return of a portfolio of stocks with high and low ratios of book-to-market values, MOM_t is the price momentum factor[30] and e_{it} is the random error.

Information ratio measures the average return of a portfolio in excess of benchmark portfolio per unit of risk undertaken. The load-adjusted information ratio for fund *i* for the out-of-sample period (Goodwin, 1998; Reilly et al, 2010) is specified by:

$$IR_i = \frac{\overline{R_i} - \overline{R_b}}{\sigma_{ER}} = \frac{\overline{ER_i}}{\sigma_{ER}} \tag{8}$$

where $\overline{R_i}$ is the average monthly return, $\overline{R_b}$ is the average monthly return for the benchmark portfolio (S&P 500 for the United States and S&P/TSX Composite Index for Canada), $\overline{ER_i}$ is the average excess return, and σ_{ER} is the standard deviation of the excess return.

2.2.2A: Regression Analysis

We now discuss the two methods used to examine the predictive power of the Morningstar ratings and that of the four alternative predictors' rankings.

First, we use cross-sectional regression analysis using appropriate dummy variables. This procedure helps us to identify the differences in performance regarding the predictive ability among the rated funds. This approach is also used by Blake and Morey (2000), Kräussl and Sandelowsky (2007), Morey (2002b), and Morey and

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[29] We collected the four-index model data from Kenneth R. French data library (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html), and Claude Francoeur**,** CGA Professorship in Strategic Financial Information, HEC Montreal (http://expertise.hec.ca/professorship_information_financiere_strategique/fama-french-canadian-factors/).
[30] Momentum factor designates a stock that has performed well in recent time will continue to perform well and the stock that has performed poor recently will continue to perform poor.

Gottesman (2006). For the analysis, we use the following regression equation (Blake &

Morey, 2000; Morey, 2002b; Morey & Gottesman, 2006):

$$S_i = \gamma_0 + \gamma_1 D4_i + \gamma_2 D3_i + \gamma_3 D2_i + \gamma_4 D1_i + u_i \tag{9}$$

where S_i is out-of-sample performance measure for fund i (for both load adjusted and

non-load adjusted monthly return). The dummy variables were coded as zero (0) and one

(1). *D4, D3, D2* and *D1* are the binary dummy variables and *D4* = 1 if a fund receives an

overall four-star rating as of July 1, 2002,[31] otherwise 0; *D3* = 1 if fund receives an

overall three-star ratings as of July 1, 2002, otherwise 0; *D2* = 1 if the fund receives an

overall two-star ratings as of July 1, 2002, otherwise 0; *D1* = 1 if the fund receives an

overall one-star ratings as of July 1, 2002, otherwise 0; and i = 1 through N, where N is

the total number of funds in the sample data.

The coefficient γ_0 designates the mean load adjusted or non-load adjusted

performance measure for the five-star rated funds and $\gamma_1, \gamma_2, \gamma_3, \gamma_4$ capture the

performance of the four-, three-, two-, and one-star rated funds respectively, relative to

that of the five-star rated funds. In this equation, we use five-star funds as the reference

group[32] (or the alternative predictors' five-star group) as they can provide a ceiling with

which we can compare the performance of the lower-rated funds.

Further, if we assume that Morningstar ratings (or the alternative predictors'

rankings) are flawless about the predictive power, then the inequality $(\gamma_1 > \gamma_2 > \gamma_3 > \gamma_4)$

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[31] For the complete funds, we considered the ratings of July 1, 2002, for both the United States and Canada. For periodic funds we considered the ratings of July 1, 2002; July 1, 2003; July 1, 2004; July 1, 2005; July 1, 2006; July 1, 2007; July 1, 2008 for both the United States and Canada and July 1, 2009; July 1, 2010 for only the United States. To compare with alternative predictor, we consider the ratings of July 1, 2002 for both countries. For bull and bear periods, we consider January 1, 2003 and July 1, 2007 respectively for both countries. To compare old and new rating methods, we consider the ratings of June 1, 1993 (old) and July 1, 2002 (new) for U.S. funds and December 1, 1994 (old) and July 1, 2002 (new) for Canadian funds.
[32] We also use four-star funds as the reference group in supplementary analysis and found that the results are similar to the five-star funds reference group.

will hold as four-star rated funds should perform better than the three-star rated funds group and so on. In that case, the regression coefficients should be increasingly negative (and significant) from γ_1 to γ_4, which indicates that the Morningstar ratings or alternative predictors' rankings accurately predict out-of-sample performance. We also perform the test of differences of the coefficients (i.e., $\gamma_1, \gamma_2, \gamma_3, \gamma_4$) to identify how the higher rated funds perform on average compared to the lower-rated funds (Morey & Gottesman, 2006). To examine this, we perform the Z-test[33] (Duncan, 1970; Paternoster, Brame, Mazerolle, & Piquero, 1998) and identify whether the differences of the regression coefficients have the expected sign and are significant or not.

We except regression coefficients to be sequentially negative and significant, implies the lower-rated funds perform significantly worse on average than the higher-rated funds.

2.2.2B: Spearman-Rho Rank Correlation Test

We use one-tailed[34] Spearman-Rho rank correlation test to identify the direction and magnitude of association between in-sample Morningstar ratings (or alternative predictors' rankings) with the out-of-sample rankings of four performance measures. We conduct this test for both load adjusted and non-load adjusted data.

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[33]

$$Z = \frac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}$$

where b_1 is the first coefficient of the regression, b_2 is the second coefficient of the same regression, SEb_1 is the standard error of the first coefficient of the regression, and SEb_2 is the standard error of the second coefficient of the same regression.

[34] We also conduct two-tailed Spearman-Rho rank correlation tests for the same samples. The results are quantitatively similar.

The Spearman-Rho rank correlation test is a non-parametric experiment that measures the direction and magnitude of the monotonic[35] relationship between two ranked variables. It uses ranks to calculate the correlation. The two variables must be ordinal, interval or ratio data. The rank correlation coefficient can take values from +1 to -1. A value of +1 designates perfect correlation between ranks; whereas a value of -1 specifies a perfect negative correlation between ranks. A value of zero designates no association between ranks. The further the correlation value is from zero, the stronger the correlation between the ranks.

To conduct the test[36], we first calculate the out-of-sample performance for each fund for nine years or seven-and-a-half-years, four years and one year using four performance measures. Then we rank the in-sample Morningstar's published ratings (or the alternative predictors' rankings) and the out-of-sample rankings of all four performance measures in descending order. Then we perform the bivariate correlation between out-of-sample ranking by each of four performance measures and in-sample Morningstar's ratings (or alternative predictors' rankings).

A low correlation between in-sample Morningstar ratings (or the alternative predictors rankings) and out-of-sample rankings of performance measures indicates poor future performance (Blake & Morey, 2000).

The null hypothesis of the test is: no (monotonic) correlation exists between the Morningstar ratings (or the alternative predictors' rankings) and the four out-of-sample performance measures.

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[35] A monotonic relationship is one that when the value of one variable increases the value of other variable also increases or decreases.
[36] In this test we do not divide our rank data into deciles.

2.3: Examining the Study Objectives

Now, we discuss in more details the four performance measures and two statistical methods used in this study.

2.3.1: Predictive Power of the Morningstar's New Ratings

To investigate the predictive power of the new star ratings we use data from July 2002 to June 2011 for the United States and from July 2002 to December 2009 for Canada. We use both load-adjusted and non-load adjusted monthly return data for both complete funds and periodic funds to calculate the four performance measures i.e., S_i of Equation 9. We calculate S_i for three different sample periods: nine years or seven-and-a-half years; four years; and one year.

We perform regression analysis (Equation 9) and the Spearman-Rho rank correlation tests to determine the predictive power of the new star ratings. In case of regression analysis, the S_i or the out-of-sample performance measure for fund i is the load-adjusted or non-load adjusted performance measures. The predictors that we use in Equation 9 are from Morningstar's published ratings of July 2002 (for complete funds) or July of each consecutive year from 2002 to 2010 (for periodic funds) for both countries.

To perform the Spearman-Rho rank correlation test, we organize the Morningstar ratings of July 2002 (for complete funds) or July of each consecutive year from 2002 to 2010 (for periodic funds) and the out-of-sample rankings of four performance measures for both countries in a descending order. We then perform the bivariate correlation between them to identify how associated are those two different rankings of funds.

2.3.2: Comparative Predictive Power of New Star Ratings and Alternative Predictors'

Rankings

To compare the predictive power of Morningstar's new ratings with those of four

alternative predictors' ranking our data range from July 1992 to June 2011 for the United

States and from July 1992 to December 2009 for Canada. In this section of the study, we

use only load adjusted in-sample monthly return data for only complete funds. To

perform the study, we first rank the July 2002 complete funds using the alternative

predictors' star in the following way (same as the Morningstar star rating).

We use three different time periods to compute the alternative ranking, that is, ten

years (July 1992 to June 2002), five years (July 1997 to June 2002), and three years (July

1999 to June 2002). We use monthly return data of 768 funds for the United States and

176 funds for Canada to calculate the Sharpe ratio, information ratio, Jensen alpha and

four-index alpha. The same methodology[37] has been used for alternative predictors as for

Morningstar, to compute the final overall ranking of any fund using the three different

time periods. If a fund's age is more than 10 years then we put 50% weight on its 10-year

ranking, 30% weight on its five-year ranking and 20% weight on its three-year ranking. If

a fund's age is less than 10 years but more than five years, then we put 60% weight on its

five-year ranking and 40% weight on its three-year ranking. Further, If a fund's age is

less than five years but more than three years, then we 100% weight on its three-year

ranking.

We perform similar regression analysis (Equation 9) as mentioned earlier for the

above stated sample periods to examine the predictive power of five predictors. The

predictors that we use in Equation 9 are from the alternative predictors' rankings of funds

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[37] For details see Table 1.

from July 2002 or Morningstar's published ratings of July 2002. To calculate the S_i we use three different sample periods- nine years (July 2002 to June 2011 for the United States) or seven-and-a-half years (July 2002 to December 2009 for Canada), four years (July 2002 to June 2006), and one year (July 2002 to June 2003).

For Spearman-Rho rank correlation test, we organize the Morningstar's published ratings of July 2002 or alternative predictors' rankings of July 2002 (that we determine earlier) and the out-of-sample rankings of four performance measures for both countries in a descending order. We then perform the bivariate correlation between each of four performance measures and five predictors for both countries.

2.3.3: New Star Ratings' Predictive Power in Bull and Bear Periods

To identify the new star ratings' predictive power in bull and bear economic periods[38] for both the United States and Canada, we divide our sample into two groups. The time frame for the bull period is from January 2003 to June 2007 for both the United States and Canada, and the bear period is from July 2007 to December 2010 for the United States and from July 2007 to December 2009 for Canada. In this section, we use only load adjusted monthly returns for only the complete funds.

In this analysis we include the same common funds that have an overall rating for both January 1, 2003 and July 1, 2007. The total number of funds in this analysis is 810 for the United States and 183 for Canada. We calculate the out-of-sample performance measures (i.e., Sharpe ratio or others) for all the funds for the sample period mentioned above.

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[38] The time line for the bull and bear period is obtained from the Federal Reserve Bank of New York (http://www.newyorkfed.org/index.html), The Bank of Canada (http://www.bankofcanada.ca), the Factset, and finance.yahoo.com.

To examine the predictive power of the new star ratings in the bull and bear periods we perform regression analysis (Equation 9) as described earlier for both countries. The predictors that we use in Equation 9 are from Morningstar's published ratings of January 2003 for the bull period or July 2007 for the bear period.

For Spearman-Rho rank correlation test we organize the Morningstar published ratings of January 2003 (for bull period) and July 2007 (for bear period) and the out-of-sample rankings of four performance measures for both countries in a descending order. We then perform the bivariate correlation between each of performance measures and Morningstar published ratings for both economic periods for both countries.

2.3.4: Comparative Predictive Power of the Old and New Star Ratings

We perform a comparison between the predictive power of old and new star-rating methodologies. The data used for this study range from June 1993 to May 2002 (old method) and July 2002 to June 2011 (new method) for the United States and December 1994 to May 2002 (old method) and July 2002 to December 2009 (new method) for Canada. In this analysis, we use only load adjusted monthly returns for only complete funds for both countries.

We compare the predictive power of the two methodologies through identifying the ratings of the same funds[39] with old and new star-rating methodology for both the United States and Canada. In this analysis, we consider only funds that have an overall rating on June 1, 1993 (old ratings) and July 1, 2002 (new ratings) for the United States and December 1, 1994 (old ratings) and July 1, 2002 (new ratings) for Canada. The total number of eligible funds in this analysis for the United States is 319 and for Canada it is

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[39] We select different time frames for the United States and Canada to keep the number of in-sample monthly return data constant for both new and old star-rating methods, that is, 108 months for the United States and 90 months for Canada.

56. Then we calculate one-year, four-year and nine-year or seven-and-a- half-year out-of-sample performance measures (i.e., Sharpe ratio or others) for these old and new methodologies rated funds for both the United States and Canada.

In the case of old methodology rated funds, we use June 1993 to May 1994 monthly return data to calculate one-year out-of-sample performance measures. Further, we use June 1993 to May 1997 for four-year analysis and June 1993 to May 2002 data for nine-year analysis of four performance measures for the United States. For Canada, our sample period range from December 1994 to November 1995 for one-year, December 1994 to November 1998 for four-year and December 1994 to May 2002 for seven-and-a-half-year.

We use July 2002 to June 2003 monthly return data for calculating one year out-of-sample performance measures with the new star-rating system. Further, we use monthly returns from July 2002 to June 2006 for four years and July 2002 to June 2011 for nine years (for the United States) or December 2009 for seven and a half years (for Canada) for the calculation of the four performance measures.

We perform regression analysis (Equation 9) and the Spearman-Rho rank correlation test as mentioned before to compare the predictive power of the new and old star ratings for both countries. The predictors that we use in Equation 9 are from Morningstar's published ratings of June 1993 (for the United States) or December 1994 (for Canada) for the old ratings and July 2002 for new ratings for both countries.

For Spearman-Rho rank correlation test we organize the Morningstar published ratings of June 1993 (old) and July 2002 (new) for the United States and December 1994 (old) and July 2002 (new) for Canada and the out-of-sample rankings of four

performance measures for both methods in a descending order. We then perform the

bivariate correlation between each of performance measures and Morningstar published

ratings for both methods and for both countries.

Table 3 provides a summary of the study objectives including the total number of

funds in each sample data groups, the out-of-sample periods for the different objectives,

the in-sample rating periods for the Morningstar published ratings (and also alternative

predictors' ratings). This table also displays the types of predictors that we use for the

regression analysis under different study objectives.

Table 3 Summary Table of Study Objectives: Total Number of Sample Funds on Different Out-Of-Sample Periods

Objectives	Performance measure	Sample data group	No. of sample funds		Rating time		Out-of-sample period				Predictor
			U.S.	Canada	U.S.	Canada	U.S.		Canada		
Predictive power of new star ratings	All four	Both complete funds and periodic funds	768 for complete funds and variable[40] for periodic funds	176 for complete funds and variable for periodic funds	Jul 2002 for complete funds and variable for periodic funds		Complete funds: Jul 2002 to Jun 2011; Jul 2002 to Jun 2006; and so on; Jul 2002 to Jun 2003	Periodic funds: Jul 2002 to Jun 2011; Jul 2002 to Jun 2006 and so on; Jul 2002 to Jun 2003 and so on	Complete funds: Jul 2002 to Dec 2009; Jul 2002 to Jun 2006; Jul 2002 to Jun 2003	Periodic funds: Jul 2002 to Dec 2009; Jul 2002 to Jun 2006 and so on; Jul 2002 to Jun 2003 and so on	Morningstar ratings
Comparison of Morningstar ratings and alternative predictors' ratings	All four	Only complete funds	768	176	Jul 2002		Jul 2002 to Jun 2011; Jul 2002 to Jun 2006; Jul 2002 to Jun 2003		Jul 2002 to Dec 2009; Jul 2002 to Jun 2006; Jul 2002 to Jun 2003		Morningstar ratings and alternative predictors ratings
New star ratings' predictive power in bull and bear periods	All four	Only complete funds	810 for both periods	183 for both periods	Jan 2003 for bull and Jul 2007 for bear period		Bull period: Jan 2003 to Jun 2007; bear period: Jul 2007 to Dec 2010		Bull period: Jan 2003 to Jun 2007; bear period: Jul 2007 to Dec 2009		Morningstar ratings
Comparison of predictability of the old and new star ratings	All four	Only complete funds	319 for both methods	56 for both methods	Jul 2002 for new and Jun 1993 for old method	Jul 2002 for new and Dec 1994 for old method	New method: Jul 2002 to Jun 2011; Jul 2002 to Jun 2006; Jul 2002 to Jun 2003	Old method: Jun 1993 to May 2002; Jun 1993 to May 1997; Jun 1993 to May 1994	New method: Jul 2002 to Dec 2009; Jul 2002 to Jun 2006; Jul 2002 to Jun 2003	Old method: Dec 1994 to May 2002; Dec 1994 to Nov 1998; Dec 1994 to Nov 1995	Morningstar ratings

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[40] For details see Table 2

<div align="center">3.0 Results of the Analysis</div>

In this chapter, we report the results of our study. In section 3.1 we present the results concerning the predictive power of Morningstar's new rating system and in section 3.2 we report the comparative performance of the new star-rating method relative to the four alternative predictors. Then in section 3.3, we discuss the results of our study regarding Morningstar's new ratings' predictive power for bull and bear period. In section 3.4, we present the results of the comparison of the predictive power of the old and new star ratings.

3.1: Predictive Power of Morningstar's New Ratings

In this section, we report the results of the regression analysis and the Spearman-Rho rank correlation test for both the complete funds and periodic funds. We use both load adjusted and non-load adjusted monthly returns to perform all the tests in this section. We also report the results of the test of differences in coefficients use in the regression analysis.

3.1.1: Results of the Analysis of Complete Funds

At first, we report the results of the regression analysis[41] and then present the results of Spearman-Rho rank correlation test for both countries. In the regression analysis, we discuss the results of the mid-term (four-year) sample period and then include the results of the short-term (one-year) and long-term (nine-year or seven-and-a-half-year) sample periods. The detail results are provided in the appendix C.

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[41] We have performed the White (1980) test to examine the heteroskedasticity for all the regression results in this study and none of the regression residuals show the presence of heteroskedasticity at the 10% level.

3.1.1A: Results of the Regression Analysis of Complete Funds: U.S. Funds

Table 4 presents the results of the regression analysis (Equation 9) of the four

different performance measures for load-adjusted and non-load adjusted monthly returns,

using Morningstar ratings of July 2002 as predictor of future performance of U.S. funds.

The four-year out-of-sample period for this analysis is from July 2002 to June 2006.

Table 4 Regressions Analysis Using Morningstar Star as Predictor for U.S. Funds

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-stat	Adj R^2
Non LA Sharpe ratio	0.206* (27.189)	-0.019* (-2.108)	-0.029* (-3.261)	-0.018* (-1.827)	-0.026* (-1.737)	2.767*	0.009
Non LA information ratio	0.065* (7.828)	-0.020* (-1.942)	-0.020* (-2.077)	-0.002 (-0.180)	-0.002 (-0.092)	2.279**	0.007
Non LA Jensen alpha	0.325* (7.852)	-0.080** (-1.597)	-0.105* (-2.187)	-0.024 (-0.439)	-0.085 (-1.036)	1.736	0.004
Non LA four-index alpha	0.091* (2.975)	-0.063* (-1.705)	-0.096* (-2.704)	-0.052** (-1.332)	-0.107* (-1.786)	2.089**	0.006
LA Sharpe ratio	0.206* (27.186)	-0.019* (-2.109)	-0.029* (-3.262)	-0.018* (-1.827)	-0.026* (-1.738)	2.768*	0.009
LA information ratio	0.065* (7.816)	-0.020* (-1.945)	-0.020* (-2.081)	-0.002 (-0.184)	-0.002 (-0.093)	2.283**	0.007
LA Jensen alpha	0.325* (7.853)	-0.080** (-1.599)	-0.105* (-2.191)	-0.024 (-0.443)	-0.085 (-1.038)	1.738	0.004
LA four-index alpha	0.090* (2.974)	-0.063* (-1.706)	-0.096* (-2.706)	-0.053** (-1.334)	-0.107* (-1.788)	2.091**	0.006

Note. Sample size of 768 includes those U.S. funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2006. *t*-statistics are in parentheses. LA = Load Adjusted
* indicates significance at the 5% level[42].
** indicates significance at the 10% level.

The 1st column of Table 4 represents the out-of-sample performance measures,

i.e., S_i in Equation 9. The second column presents the estimates of γ_0 (the constant)

which represents the average performance of five-star rated funds. Columns three to six

display regression coefficients $\gamma_1, \gamma_2, \gamma_3$, and γ_4, which represent the performance of

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[42] We have conducted one-tailed t-tests for all the tests of statistical significance in this study. However, we also perform two-tailed t-tests for the same samples and results are similar.

four-, three-, two-, and one-star rated funds relative to the performance of the five-star rated funds.

The F-statistics[43] from Table 4 shows that, the regression equations are mostly significant (at the 5% and 10% level). The adjusted R^2 are not high[44]. However, these values are consistent with previous studies (i.e., Blake and Morey, 2000; Kräussl and Sandelowsky, 2007; Morey and Gottesman, 2006).

In the regression analysis we examine whether the coefficients have the expected sign and are significant or not. Table 4 shows that the estimates γ_0 are all positive and significant (for both load-adjusted and non-load adjusted monthly returns). This implies that the average performances of the five-star rated funds are positive and significant. Further, when we consider coefficients $\gamma_1, \gamma_2, \gamma_3$, and γ_4 of Table 4 (columns three to six), we note that all the coefficient estimates are negative (correct sign) as expected, implying the direction is correct for all the cases. We also note that, 75%[45] of the coefficient estimates are both negative and significant, indicating in three fourth of the cases the five-star rated funds significantly outperform other funds. This result presents strong evidence that the new star ratings accurately predict the future performance of the five-star rated funds for medium-term (four-year) sample period.

For example, the results of the load-adjusted (LA) Sharpe ratio from Table 4 show that the γ_0 is positive and significant. The average performance of five-star rated funds is 0.206. For the four-star rated funds regression estimate γ_1 is -0.019 which is significant. It implies that the average performance of the four-star rated funds is 0.187 (i.e., 0.206 –

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[43] F-statistics describes whether the model as a whole has statistically significant predictive ability.
[44] The adjusted R^2 represents the proportion of variance in the dependent variable that is explained by the independent variables (Stock & Watson, 2007).
[45] (No. of significant coefficients/ Total no. of coefficients)*100 = (12/16)*100= 75%

0.019), which is lower than the five-star rated funds. Similarly, we see that all the coefficient estimate of three-, two-, and one-star rated funds (i.e., γ_2, γ_3, and γ_4) are significantly lower than the five-star rated funds. This result implies that the five-star rated funds significantly outperforms all the other funds. These results also suggest that the new star ratings accurately predict the performance of five-star rated funds relative to all other funds.

If we only consider four-star and three-star rated funds, the results shows that the direction is correct for these two funds. Again, if we only consider two- and one-star rated funds, result also shows the direction is correct for these two funds. But, if we consider all the four-, three-, two- and one-star rated funds together, result shows that the direction is not always correct. This implies that, although all of the regression coefficient estimates are negative and significant, they are not always increasingly negative, i.e., they do not always maintain the expected inequality.

In order to identify how the higher-rated funds perform on average compared to the lower-rated funds, we perform the tests of differences of the coefficients from the regression analysis. In this test we attempt to identify whether the differences of the coefficient estimates are negative and significant or not, between each pair of funds.

Table 5 displays the results of the tests of differences in coefficient estimates from Table 4. Column two represents the comparative difference in performance between four- and three-star rated funds, and column three represents the comparative difference in performance between four- and two-star rated funds, and so on. If we consider the non-load adjusted (LA) section of Table 5, for instance, result shows that the regression coefficient estimates are increasingly negative in some cases. In other words, we can say

that, lower-rated funds perform better than higher-rated funds in some cases (where the sign of the coefficient estimates are positive), which will lead to confusion in predicting out-of-sample performance. However, none of the difference of the coefficient estimates is significant; suggesting there are no differences in performance among any pair of the four-, three-, two-, and one-star rated funds.

Table 5 Tests of Differences in Coefficients for U.S. Funds

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.01 (-0.7857)	0.001 (0.0743)	-0.007 (-0.4002)	0.011 (0.8176)	0.003 (0.1715)	-0.008 (-0.4438)
Non LA information ratio	0 (0)	0.018 (1.2108)	0.018 (0.954)	0.018 (1.2108)	0.018 (0.954)	0 (0)
Non LA Jensen alpha	-0.025 (-0.3607)	0.056 (0.7609)	-0.005 (-0.0521)	0.081 (1.1211)	0.02 (0.2105)	-0.061 (-0.6213)
Non LA four-index alpha	-0.033 (-0.6479)	0.011 (0.2046)	-0.044 (-0.6242)	0.044 (0.8397)	-0.011 (-0.1584)	-0.055 (-0.7686)
LA Sharpe ratio	-0.01 (-0.7857)	0.001 (0.0743)	-0.007 (-0.4002)	0.011 (0.8176)	0.003 (0.1715)	-0.008 (-0.4438)
LA information ratio	0 (0)	0.018 (1.2108)	0.018 (0.954)	0.018 (1.2108)	0.018 (0.954)	0 (0)
LA Jensen alpha	-0.025 (-0.3607)	0.056 (0.7609)	-0.005 (-0.0521)	0.081 (1.1211)	0.02 (0.2105)	-0.061 (-0.6213)
LA four-index alpha	-0.033 (-0.6479)	0.01 (0.186)	-0.044 (-0.6242)	0.043 (0.8206)	-0.011 (-0.1584)	-0.054 (-0.7546)

Note. This table reports the difference in the coefficient used in the regression Equation 9 and presented in Table 4. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in parentheses. LA = Load Adjusted.

If the differences of the coefficient estimates are negative and significant, it implies that, the lower-rated funds perform significantly worse than the higher-rated funds (Morey & Gottesman, 2006). There are 10 cases (42%) out of a total of 24 cases where differences of estimates have the correct negative sign (for both load-adjusted and non-load adjusted performance measures); indicating less than half of the cases the direction is correct. However, none of the differences in the pairwise coefficient estimates is significant, implies there is no difference in performance among these four-, three-, two-, and one-star rated funds.

In sum the above discussion shows strong evidence that the new star ratings accurately predict for only the five-star rated funds for the medium-term sample period. Also the new star ratings cannot distinguish between the performance of four-, three-, two-, and one-star rated funds for the medium-term sample period.

3.1.1B: Results of the Regression Analysis of Complete Funds: Canadian Funds

Table 6 presents the results of the regression analysis (Equation 9) of four different performance measures using load-adjusted and non-load adjusted monthly returns, with Morningstar ratings of July 2002 as predictor of future performance of Canadian funds. The four-year out-of-sample period for this analysis is from July 2002 to June 2006.

The F-statistics of Table 6 show that the regression equation is mostly not significant. The adjusted R^2 are not high. However, the results are consistent with other previous studies (Blake & Morey, 2000; Kräussl & Sandelowsky, 2007; Morey & Gottesman, 2006).

Table 6 also illustrates how the top-rated funds perform on average, compared to the other funds. Result shows that in most of the cases (three out of four cases) the estimates of γ_0 is positive and significant, implying the average performance of the five-star rated funds are positive and significant. Further, if we consider coefficients $\gamma_1, \gamma_2, \gamma_3,$ and γ_4 of Table 6, it shows that there are 14 negative coefficient estimates out of 16 cases for the load-adjusted performance measures, implying 88% cases the direction is correct. The results also show that, 62% of the cases the coefficient estimates are both negative and significant, indicates approximately two third of the cases the five-star rated funds significantly outperform other funds. This result presents strong evidence that the

new star ratings accurately predict the future performance of the five-star rated funds for

medium-term (four-year) sample period.

Table 6 Regressions Analysis Using Morningstar Star as Predictor for Canadian Funds

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-stat	Adj. R^2
Non LA Sharpe ratio	0.281* (15.720)	-0.033** (-1.431)	-0.036** (-1.574)	-0.057* (-2.233)	-0.099* (-2.173)	1.907	0.020
Non LA information ratio	-0.009 (-0.451)	-0.005 (-0.189)	0.010 (0.372)	0.003 (0.111)	0.012 (0.234)	0.115	-0.021
Non LA Jensen alpha	0.219* (2.838)	-0.118 (-1.194)	-0.168* (-1.708)	-0.236* (-2.165)	-0.352* (-1.795)	1.644	0.015
Non LA four-index alpha	0.122* (2.260)	-0.084 (-1.208)	-0.094** (-1.357)	-0.184* (-2.402)	-0.272* (-1.971)	1.947	0.021
LA Sharpe ratio	0.281* (15.714)	-0.033** (-1.429)	-0.036** (-1.571)	-0.060* (-2.357)	-0.099* (-2.174)	2.023**	0.023
LA information ratio	-0.010 (-0.509)	-0.005 (-0.174)	0.010 (0.386)	-0.002 (-0.064)	0.012 (0.232)	0.124	-0.020
LA Jensen alpha	0.217* (2.831)	-0.117 (-1.194)	-0.168* (-1.707)	-0.235* (-2.167)	-0.353* (-1.802)	1.650	0.015
LA four-index alpha	0.121* (2.249)	-0.083 (-1.208)	-0.094** (-1.357)	-0.183* (-2.403)	-0.272* (-1.976)	1.951	0.021

Note. Sample size of 176 includes those Canadian funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2006. *t*-statistics are in parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

For example, if we consider load-adjusted (LA) Sharpe ratio, it shows that γ_0 is

positive and significant. All the coefficient estimates $\gamma_1, \gamma_2, \gamma_3,$ and γ_4 are negative and

significant , as expected, implying that the five-star rated funds significantly outperform

all other funds. These results also suggest that the new star ratings accurately predict the

performance of five-star rated funds relative to the other funds for all cases.

Again, if we consider all the four-, three-, two-, and one-star rated funds together

from Table 6, result shows that most of the coefficient estimates are increasingly

negative. The coefficient estimates of three out of four performance measures are

increasingly negative for both load-adjusted and non-load adjusted performance

measures.

In order to investigate how the higher-rated funds perform on average compared to the lower-rated funds, we perform the tests of differences of the coefficients used in the regression analysis. Here we examine whether the differences of the regression coefficient estimates are negative and significant or not.

Table 7 Tests of Differences in Coefficients for Canadian Funds

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.003	-0.024	-0.066**	-0.021	-0.063	-0.042
	(-0.0922)	(-0.7065)	(-1.2833)	(-0.6182)	(-1.225)	(-0.8022)
Non LA information ratio	0.015	0.008	0.017	-0.007	0.002	0.009
	(0.4079)	(0.2054)	(0.2970)	(-0.1797)	(0.0349)	(0.1534)
Non LA Jensen alpha	-0.05	-0.118	-0.234	-0.068	-0.184	-0.116
	(-0.3608)	(-0.8050)	(-1.0678)	(-0.4639)	(-0.8397)	(-0.5172)
Non LA four-index alpha	-0.01	-0.1	-0.188	-0.09	-0.178	-0.088
	(-0.1025)	(-0.9672)	(-1.2185)	(-0.8705)	(-1.1537)	(-0.5569)
LA Sharpe ratio	-0.003	-0.027	-0.066**	-0.024	-0.063	-0.039
	(-0.0922)	(-0.7948)	(-1.2833)	(-0.7065)	(-1.225)	(-0.7449)
LA information ratio	0.015	0.003	0.017	-0.012	0.002	0.014
	(0.4076)	(0.0770)	(0.2924)	(-0.3081)	(0.0344)	(0.2351)
LA Jensen alpha	-0.051	-0.118	-0.236	-0.067	-0.185	-0.118
	(-0.368)	(-0.8050)	(-1.077)	(-0.4571)	(-0.8442)	(-0.5262)
LA four-index alpha	-0.011	-0.1	-0.189	-0.089	-0.178	-0.089
	(-0.1127)	(-0.9742)	(-1.225)	(-0.867)	(-1.1537)	(-0.5649)

Note. This table reports the differences in the coefficient used in the dummy variable regression Equation 9 and presented in Table 6. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in parentheses. LA = Load Adjusted.
** indicates significance at the 10% level.

Table 7 illustrates the tests of differences of the regression coefficient estimates presented in Table 6. Column two of Table 7 illustrates the comparative performance of four- and three-star rated funds; column three illustrates the comparative performance of four- and two-star rated funds, and so on. If we consider the non-load adjusted (Non LA) Sharpe ratio, for instance, from Table 7, the result shows that, all of the differences of the regression coefficient estimates are negative, as expected, implies the direction is correct for all of these four-, three-, two-, and one-star rated funds. However, only one of the differences of the estimates is significant, implies that the four-star rated funds perform

significantly better than only the one-star rated funds. But for other funds, there is no difference in performance among any pair of funds.

There are 19 cases out of a total 24 cases (for both load-adjusted and non-load adjusted monthly returns) where the differences of the coefficient estimates have correct negative signs, implying in 79% of cases the direction is correct. However, only one of the differences of the coefficient estimates is significant (4%); indicating there are no differences in performance among any pair of the four-, three-, two-, and one –star rated funds, except only one instance.

The above discussion shows strong evidence that the new star ratings accurately predict for only the five-star rated funds for the medium-term sample period. Also the new star ratings cannot distinguish statistically between the performance of four-, three-, two-, and one-star rated funds for the medium-term sample period.

3.1.1C: Results of the Regression Analysis of Complete Funds: All Sample Periods

We also perform similar regression analyses for the short-term (one-year) and long-term (nine-years or seven-and-a-half-years) sample periods for both U.S. and Canadian complete funds. The summary results of these regression analyses are provided in the following section.

Table 8 presents the summary of the regression analyses of the four performance measures for load-adjusted monthly returns [46] using Morningstar ratings of July 2002 as predictor. 1st column of Table 8 shows two different countries, second column represent the total number of negative coefficients in each of regression coefficient estimates (with four different performance measures). Column three to five represent the three different

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[46] In Table 8 we only mention the results of all load-adjusted monthly returns because the results of the non-load adjusted returns are similar. We have provided all of the detailed results in Appendix C.

sample periods and the total number of regression coefficients with negative sign

(significant cases are in parentheses) in each of four-, three-, two-, and one-star rated

funds.

Table 8 Summary of Regressions Using Morningstar Ratings as Predictor: Complete
Funds

Country	Coefficient has correct negative sign	Nine/ Seven and a half years	Four years	One year
		LA	LA	LA
U.S.	Total (out of 16)	11 (4)	16 (12)	16 (15)
	4-star funds (out of 4)	4 (0)	4 (4)	4 (4)
	3-star funds (out of 4)	4 (4)	4 (4)	4 (4)
	2-star funds (out of 4)	1 (0)	4 (2)	4 (4)
	1-star funds (out of 4)	2 (0)	4 (2)	4 (3)
Canada	Total (out of 16)	5 (1)	14 (10)	16 (3)
	4-star funds (out of 4)	0 (0)	4 (1)	4 (0)
	3-star funds (out of 4)	0 (0)	3 (3)	4 (1)
	2-star funds (out of 4)	1 (0)	4 (3)	4 (1)
	1-star funds (out of 4)	4 (1)	3 (3)	4 (1)

Note. Significant cases are in parentheses. LA = Load-Adjusted

Table 8 shows that, only 25% cases the coefficient estimates are negative and

significant for the nine-year (long-term) sample period for the U.S. funds. This implies

that the new star ratings predict the future performance of the five-star rated funds for

only one fourth of the cases for the long-term sample period. On the other hand, 94%

cases the coefficient estimates are negative and significant for the one-year (short-term)

sample period, implies in most of the cases the new star ratings can accurately predict the

future performance of the five-star rated funds for short-term sample period. These

results indicate that the predictive power of new star ratings is better for mid- and short-

term sample periods compared to long-term period for the five-star rated U.S. complete

funds.

Again, when we compare the performance of four-, three-, two-, and one-star rated funds (pairwise differences of estimates), results show that 42%[47] cases the direction is correct for the long-term sample period and 21% cases for the short-term sample period for U.S. funds. However, none of the differences of the coefficient estimates is statistically significant, implies there is no difference in performance of these funds in either of the sample period. This result further suggests that the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is low for the U.S. complete funds.

On the other hand, in the case of Canadian complete funds, only 6 % cases the coefficient estimates are negative and significant for the seven-and-a-half-year (long-term) sample period, implies the predictive power of new star ratings for the five-star rated funds is very low for the long-term sample period. Again, only 19% cases the coefficient estimates are negative and significant for the one-year (short-term) sample period, which indicates that the predictive power of new star ratings for the five-star rated funds is also low for the short-term sample period. These results indicate that the predictive power of new star ratings is better only for the mid-term sample periods compared to short- and long-term periods for the five-star rated Canadian complete funds.

Again, if we consider the performance of four- , three-, two-, and one-star rated funds (pairwise differences of estimates), results show that the direction is correct for 79% cases for the long-term sample period and 62% cases for the short-term sample period for the Canadian complete funds. However, only few of the regression coefficient estimates are significantly different (only 5%) in all three sample periods, indicate there

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[47] For details see Table C14 of Appendix C.

is no differences in performance of four- , three-, two-, and one-star rated funds except few. This result further suggests that the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is low for the Canadian complete funds.

3.1.1D: Results of the Spearman-Rho Rank Correlation Test of Complete Funds

Table 9 illustrates the results of the Spearman-Rho rank correlation test of the Morningstar's new ratings of July 2002 (in-sample ranking) versus the out-of-sample rankings of four performance measures for complete funds. In this experiment we identify how closely the in-sample ratings of Morningstar and out-of-sample rankings of each of performance measures correspond. High correlation between Morningstar ratings and each of the four performance measures' rankings represent good association of their ratings and good prediction of out-of-sample performance by Morningstar's in-sample ratings, whereas low correlation indicates poor prediction of funds' future performance.

The 1st column of Table of 9 shows different out-of-sample performance measures that we have used for the test. Column two to four represent the three different sample periods for U.S. funds and column five to seven represent the three different sample periods for Canadian funds. If we consider the correlation between non-load adjusted (LA) Sharpe ratio for four years sample period for the U.S. funds and Morningstar's published ratings of July 2002, for instance, the result shows that the correlation between these in-sample and out-of-sample ratings is 0.063, which is positive and significant. This implies that the association between these two ratings is in right direction (positive) and also the magnitude of the association is strong. This result indicates that the predictive power of the new star ratings is correct and strong for the mid-term sample period.

Table 9 Spearman-Rho Rank Correlation Test Between Morningstar Ratings of July 2002
and Four Performance Measures: Complete Funds

Out-of-sample performance measure	United States			Canada		
	Out-of-sample period			Out-of-sample period		
	Nine years	Four years	One year	Seven and a half years	Four years	One Year
Non LA Sharpe ratio	0.007	0.063*	0.041	0.062	0.189**	0.001
Non LA information ratio	-0.033	-0.019	0.035	-0.023	-0.025	0.074
Non LA Jensen alpha	-0.027	0.035	0.041	0.078	0.191**	0.021
Non LA four-index alpha	0.019	0.076*	0.132**	0.065	0.190**	0.159*
LA Sharpe ratio	0.007	0.063*	0.041	0.064	0.200**	0.001
LA information ratio	-0.033	-0.019	0.035	-0.018	-0.011	0.06
LA Jensen alpha	-0.027	0.035	0.041	0.077	0.192**	0.022
LA four-index alpha	0.018	0.076*	0.133**	0.063	0.191**	0.159*

Note.   *correlation is significant at the 5% level.
        **correlation is significant at the 1% level.
        LA = Load Adjusted

The results from Table 9 show that in most of the cases the correlation
coefficients are higher for the short- and mid-term sample periods compared to the long-
term period. For example, if we consider the correlations of the load-adjusted (LA) four-
index alpha for U.S. funds from Table 9, the result shows that the correlation values
increases from 0.018 to 0.076 to 0.133, as we move from long-term to short-term sample
periods. It implies that the in-sample ratings of Morningstar and the out-of-sample
rankings of four-index alpha is more associated with each other from long-term to short-
term sample periods.

For U.S. complete funds, there are six positive and significant correlation
coefficients (25%) out of a total of 24 and all of them are either for the mid-term or short-
term period. If we compare the correlations of U.S. funds across three sample periods, the
results show on average, the correlation values are high for short- and mid-term periods
compared to the long-term period, implying that the association of in-sample ratings and

out-of-sample rankings is better for mid- and short-term periods (for both load-adjusted and non-load adjusted returns) than the long-term period.

For Canadian funds, there are eight positive and significant correlation coefficients (33%) out of a total of 24 cases. All of these significant correlations are either for the mid-or short-term periods. Some of the correlations for Canadian funds are higher than those of U.S. funds, especially for mid-term period. Overall, the association of in-sample new star ratings and out-of-sample rankings using the four performance measures are better for mid- and short-term periods compared to long-term periods.

It appears from the prior discussion of regression analyses that the new star ratings better predict the future performance of five-star rated funds in most of the cases for the mid- and short-term periods compared to the long-term period for U.S. complete funds. For, Canadian funds the new star ratings can only predict for the medium-term sample period for the five-star rated funds. Moreover, the differences in performance between the four-, three-, two-, and one-star rated funds show that the direction of predictive power is correct for 35% cases of U.S. funds and 74% cases of Canadian funds for the four-, three-, two-, and one-star rated funds, on average . However, none of the differences of the coefficient estimates is statistically significant for both countries, except some exceptions for only Canadian complete funds. This result implies that the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is low for both countries. Further, if we compare the predictive power of new star ratings using different performance measures, the results show that the predictive power of new star ratings is similar for different performance measures over different sample periods for both countries.

The rank correlation tests also suggest that the new star ratings predict accurately for only one fourth of the cases for U.S. funds and only one third of the cases for Canadian funds. Further, the predictive power of the new star ratings is better for mid- and short-term sample periods compared to long-term period for both countries. Again, the rank correlation test also shows that the association between the ranking of new star ratings and four-index alpha is better compared other three performance measures over different sample periods for both the United States and Canada.

3.1.2: Results of the Analysis of Periodic Funds

In this section[48], we report the results of the regression analyses (Equation 9) of four performance measures for the load-adjusted monthly returns. We use Morningstar ratings of July 2002 to July 2010 for the United States and July 2002 to July 2008 for Canada as predictor for the regressions. We then report the results of Spearman-Rho rank correlation tests for the same sample periods for both countries.

We report only the summary results of the regression analyses for both the U.S. and Canadian periodic funds, since reporting all of the results of the regression analyses for each year would result in a large number of additional tables. However, all the individual regression results are provided in Appendix D.

Tables 10 and Table 11 demonstrate the summary results of the regression analysis for periodic funds of the United States and Canada, respectively. The 1st column of Table 10 shows the three different out-of-sample periods, i.e., nine years (July 2002 to June 2011), four years (July 2002 to June 2006, and so on) and one year (July 2002 to

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[48] In this section we report only the results of the load-adjusted monthly returns, as the results of the non-load adjusted returns are similar with those of load-adjusted returns. All other detailed results of the regression analyses of non-load adjusted and load-adjusted monthly returns and the Spearman-Rho rank correlation tests are provided in Appendix D.

June 2003, and so on). The second column is the in-sample rating time of Morningstar's new ratings (i.e., Morningstar's published ratings). Columns three to seven presents the total number of regression coefficient estimates with the negative sign (significant cases are within parentheses) for four performance measures.

Table 10 Summary of Regressions Using Morningstar Ratings as Predictor: U.S. LA Periodic Funds

Out-of-sample period	Rating time	Coefficient has correct negative sign				
		Total (out of 16)	4-star funds (out of 4)	3-star funds (out of 4)	2-star funds (out of 4)	1-star funds (out of 4)
Nine years	July 2002	11 (4)	4 (0)	4 (4)	1 (0)	2 (0)
Four years	July 2002	16 (12)	4 (4)	4 (4)	4 (4)	4 (2)
	July 2003	13 (3)	4 (0)	3 (1)	3 (1)	3 (1)
	July 2004	16 (14)	4 (3)	4 (4)	4 (4)	4 (3)
	July 2005	16 (11)	4 (3)	4 (3)	4 (4)	4 (0)
	July 2006	9 (0)	2 (0)	3 (0)	4 (0)	0 (0)
	July 2007	15 (3)	3 (0)	4 (3)	4 (0)	4 (0)
One year	July 2002	16 (15)	4 (4)	4 (4)	4 (4)	4 (3)
	July 2003	14 (10)	4 (3)	4 (2)	3 (2)	3 (3)
	July 2004	15 (15)	4 (4)	4 (4)	4 (4)	3 (3)
	July 2005	13 (5)	3 (0)	3 (0)	3 (1)	4 (4)
	July 2006	16 (10)	4 (2)	4 (2)	4 (2)	4 (4)
	July 2007	12 (9)	3 (0)	3 (3)	3 (3)	3 (3)
	July 2008	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	July 2009	11 (2)	3 (0)	3 (1)	3 (1)	2 (0)
	July 2010	5 (2)	0 (0)	0 (0)	2 (0)	3 (2)

Note. Significant cases are in parentheses.

If we consider the in-sample Morningstar ratings of July 2004 from Table 10, for instance, in that case the four-year out-of-sample period is from July 2004 to June 2008. The results in that sample period show that all of the regression coefficient estimates have correct negative signs. Further, 88% cases the coefficient estimates are negative and significant, implying five-star rated funds significantly outperform other funds (four-, three-, two-, and one-star rated funds) in most of the cases.

Table 10 also shows that the total numbers of negative and significant regression coefficient estimates are higher for mid- and short-term sample periods, on average, compared to long-term period, implies the new star ratings better predict the future performance of five-star rated funds for the mid- and short-term periods compared to the long-term period. Further, if we compare the four-star and three-star rated funds (4th and 5th columns of Table 10) with the two-star and one-star rated funds (the last two columns of Table 10), result shows that the total number of both negative and significant coefficient estimates are similar[49] for both the lower- and higher-rated funds. This suggests that the five-star rated funds significantly outperform both the lower- (i.e., two- and one-star) and higher-rated (i.e., four- and three-star) funds in the same fashion.

Overall, more than 45% cases the new star ratings accurately predict the out-of-sample performance of five-star rated funds (coefficient estimates are negative and significant) over different sample periods. However, the direction of predictive power is correct for more than 77% cases for the five-star rated funds.

Table 10 also shows that the predictive power of new star ratings for the five-star rated funds is relatively better from July 2002 to July 2005 for the mid-term period and from July 2002 to July 2007 for the short-term sample period, as there is comparatively more negative and significant cases in these periods. The decline in predictive power of new star ratings for the five-star rated funds from July 2006 to July 2007 for the mid-term period and from July 2008 to July 2010 for the short-term sample period may be because of the U.S. financial crisis.

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[49] More than 45% cases the estimates are both negative and significant for both higher- and lower-rated funds.

We also perform the tests of the differences in performance (i.e., Tests of differences of coefficient estimates) between four-, three-, two- , and one-star rated funds[50], to identify how the higher-rated funds perform on average compared to the lower-rated funds and maintain the expected inequality. In this test we identify whether the differences of the coefficient estimates are negative and significant or not. The result shows, on average, 58% cases the direction of predictive power is correct for the four-, three-, two-, and one-star rated funds. However, the differences of coefficient estimates are rarely significant (only 7% cases) and available mostly for lower-rated funds (i.e., two- and one-star rated funds). These significant cases are available only for the short-term sample periods. These results suggest that the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is low for the U.S. periodic funds. In other words, we can say that in most of the cases the new star ratings cannot differentiate between the performance of four-, three-, two-, and one-star rated U.S. periodic funds.

Table 11 illustrates the summary results of the regression analysis of the new star ratings for Canadian periodic funds. This table also shows that the total numbers of negative and significant coefficient estimates are more for mid- and short-term periods, on average, compared to long-term period, indicating the predictive power of the new star ratings for the five-star rated funds are better for the mid- and short-term periods compared to long-term period. However, the total numbers of negative and significant coefficient estimates are less than those of U.S. periodic funds, indicating the predictive power of new star ratings for the five-star rated funds is better for U.S. funds compared to Canadian funds.

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[50] For details see Table D34 of Appendix D.

Table 11 also shows that the total number of negative and significant coefficient estimates is more for lower-rated funds (41%) compared to higher-rated funds (14%) for Canadian periodic funds. These findings suggest that the five star-rated funds significantly outperform more of the lower-rated funds (i.e., one- , and two-star rated funds) compared to the higher-rated funds (i.e., three- , and four-star rated funds), on average. Overall, only 27% cases the news star ratings accurately predict the out-of-sample performance of five-star rated funds over different sample periods. However, the direction of predictive power is correct for more than 67% cases for the five-star rated funds.

Table 11 Summary of Regressions Using Morningstar Ratings as Predictor: Canada LA Periodic Funds

Out-of-sample period	Rating time	Coefficient has correct negative sign				
		Total (out of 16)	4-star funds (out of 4)	3-star funds (out of 4)	2-star funds (out of 4)	1-star funds (out of 4)
Seven and a half years	July 2002	5 (1)	0 (0)	0 (0)	1 (0)	4 (1)
Four years	July 2002	14 (10)	4 (1)	3 (3)	4 (3)	3 (3)
	July 2003	13 (7)	3 (1)	3 (1)	4 (2)	3 (3)
	July 2004	3 (0)	0 (0)	0 (0)	3 (0)	0 (0)
	July 2005	4 (0)	0 (0)	0 (0)	0 (0)	4 (0)
One year	July 2002	16 (3)	4 (0)	4 (1)	4 (1)	4 (1)
	July 2003	16 (11)	4 (1)	4 (3)	4 (4)	4 (3)
	July 2004	9 (5)	0 (0)	1 (1)	4 (2)	4 (2)
	July 2005	14 (6)	3 (0)	3 (0)	4 (2)	4 (4)
	July 2006	9 (2)	2 (0)	2 (0)	1 (0)	4 (2)
	July 2007	8 (2)	0 (0)	2 (0)	4 (2)	2 (0)
	July 2008	7 (1)	4 (0)	1 (0)	1 (1)	1 (0)

Note. Significant cases are in parentheses.

Table 11 further shows that the predictive power of new star ratings for the five-star rated funds is relatively better from July 2002 to July 2003 for the mid-term period and from July 2002 to July 2005 for the short-term sample period, as there is comparatively more negative and significant cases in these periods. The decline in predictive power of new star ratings for the five-star rated funds from July 2004 to July

2005 for the mid-term period and from July 2006 to July 2008 for the short-term sample period may be because of the world financial crisis.

Further, the differences in performance[51] between four-, three-, two-, and one-star rated funds show that, on average, 70% cases the direction is correct for the four-, three-, two-, and one-star rated funds. However, the differences of coefficient estimates are rarely significant (only 15% cases) over different sample periods. These results suggest that the new star ratings cannot differentiate the future performance of four-, three-, two-, and one-star rated funds in most of the cases for Canadian periodic funds.

Table 12 illustrates the results of the Spearman-Rho rank correlation tests for the load-adjusted periodic funds between the Morningstar ratings of July 2002 to July 2010 for the United States and July 2002 to July 2008 for Canada (in-sample rankings), and the out-of-sample rankings of four performance measures. The results of non-load adjusted periodic funds are similar and provided in Appendix D.

For U.S. periodic funds, Table 12 shows that, in most of the cases the correlation coefficients are higher for the short- and mid-term periods compared to the long-term period. For instance, if we consider the correlations between Morningstar's new ratings and the load-adjusted (LA) Sharpe ratio for U.S. funds for July 2004, it shows the correlations increase from 0.084 to 0.122, as we move from mid–term to short-term sample periods. It implies the association between the rankings of Sharpe ratio and Morningstar increase as we move from mid-term to short-term period. The results also show that there are 10 positive and significant correlation coefficients out of a total of 24 for the mid-term sample period and 20 positive and significant correlation coefficients out of total 36 for the short-term period for the U.S. funds. However, none of the

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[51] For details see Table D60 of Appendix D.

correlation coefficients is significant for long-term period. On average, approximately 47% correlation coefficients are positive and significant, which implies in approximately half of the cases the Morningstar's new ratings (in-sample) correspond well with the out-of-sample ratings of four performance measures mostly for mid- and short-term periods. This result also indicates that the new star ratings accurately predict the future performance of U.S. periodic funds for approximately half of the cases.

For the Canadian funds, the rank correlation tests also shows that correlations are higher for mid- and short-term periods compared to the long-term period. It further shows that, some of the correlation values are higher for Canadian funds compared to those of U.S. funds for both mid- and short-term periods. There are 6 positive and significant correlation coefficients out of a total of 16 for the mid-term period and 14 positive and significant correlation coefficients out of a total of 28 for the short-term sample period for Canadian funds. Though, none of the correlation coefficients is significant for the long-term sample period. These results suggest that approximately 42% cases the new star ratings (in-sample ratings) and the out-of-sample ratings of four performance measures well associate with each other, mostly for the mid- and the short-term sample periods. This result further indicates that the new star ratings accurately predict the future performance of Canadian periodic funds for less than half of the cases.

Overall, the prior discussion of regression analyses suggest that the predictive power of Morningstar's new ratings is better for mid- and short-term periods compared to the long-term period for the five-star rated funds for both the U.S. and Canadian periodic funds.

Table 12 Spearman-Rho Rank Correlation Test Between Morningstar Ratings of July 2002- July 2010 and Four Performance Measures: Periodic Funds

Out-of-Sample Period	Rating period	Out-of-sample performance measure							
		United States				Canada			
		LA Sharpe ratio	LA information ratio	LA Jensen alpha	LA four-index alpha	LA Sharpe ratio	LA information ratio	LA Jensen alpha	LA four-index alpha
Nine / Seven and a half years	2002	0.007	-0.033	-0.027	0.018	0.064	-0.018	0.077	0.063
Four years	2002	0.063*	-0.019	0.035	0.076*	0.200**	-0.011	0.192**	0.191**
	2003	0.041	-0.059*	0.032	0.036	0.196**	-0.011	0.268**	0.230**
	2004	0.084**	0.075*	0.075**	0.059*	-0.018	-0.058	0	0.028
	2005	0.067*	0.064*	0.065*	0.06*	0.05	0.051	0.053	0.057
	2006	-0.002	-0.007	-0.007	0.013	N/A	N/A	N/A	N/A
	2007	0.043	0.042	0.041	0.034	N/A	N/A	N/A	N/A
One year	2002	0.041	0.035	0.041	0.133**	0.001	0.06	0.022	0.159*
	2003	0.064*	-0.049	0.035	0.063*	0.253**	0.104	0.284**	0.137*
	2004	0.122**	0.117**	0.135**	0.045	0.158**	0.115*	0.164**	0.175**
	2005	0.069*	0.066*	0.073**	0.043	0.117*	0.092	0.114*	0.079
	2006	0.079**	0.063*	0.104**	0.110**	-0.014	0.034	-0.068	-0.166**
	2007	0.140**	0.116**	0.138**	0.015	0.224**	0.227**	0.196**	0.167**
	2008	-0.111**	-0.089**	-0.129**	-0.056*	-0.235**	-0.150**	-0.230**	0.151**
	2009	0.042	-0.036	0.029	0.073**	N/A	N/A	N/A	N/A
	2010	0.079**	-0.081**	0.077**	0.061*	N/A	N/A	N/A	N/A

Note. * correlation is significant at the 5% level.

    ** correlation is significant at the 1% level.

    LA = Load Adjusted

Furthermore, the new star ratings accurately predict the out-of-sample performance of five-star rated funds for less than half of the cases for U.S. funds and for more than one fourth of the cases for Canadian funds. Also, the predictive power of new star ratings for the four-, three-, two-, and one-star rated funds is low for both countries, as the number of negative and significant cases are minimum for the differences of the performance of the four-, three-, two-, and one-star rated funds. Further, if we compare the predictive power of new star ratings using different performance measures, the results show that the predictive power is better for the Sharpe ratio for U.S. funds and Jensen alpha for Canadian funds compared to other performance measures over different sample periods.

The results of the rank correlation tests suggest that the new star ratings accurately predict the out-of-sample performance of less than half of the cases for both U.S. and Canadian funds. These results are better for the mid- and the short-term sample periods compared to long-term period. Again, the rank correlation test also shows that the association between the rankings of Morningstar's in-sample new ratings and the Sharpe ratio (for U.S. funds) or four-index alpha (for Canadian funds) is better compared to other performance measures over different sample periods.

3.2: Comparative Predictive Power of New Star Ratings and Alternative Predictors' Rankings

In this section, we report the results[52] of the comparative analysis of Morningstar's new ratings versus that of four alternative predictors. In this part we identify which one is the best predictor of funds future performance using regression analyses and Spearman-Rho rank correlation tests. We report the results of the regression

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[52] Detailed results of this part of the study are provided in Appendix E.

analyses for the complete funds at first, and then we discuss the results of the Spearman-Rho rank correlation tests for the same sample period for both countries.

Figure 1 and Table 13 demonstrate the summary results of the regression analyses using the four alternative predictors' rankings versus Morningstar's new ratings as of July 2002, to predict funds' future performance using the load-adjusted Sharpe ratio, load-adjusted information ratio, load-adjusted Jensen alpha, and load-adjusted four-index alpha as the out-of-sample performance measures. In these analyses we examine whether the regression coefficient estimates are negative and significant or not.

Figure 1 is the graphical illustration of the comparison about the predictive power of Morningstar's new ratings versus that of the four alternative predictors. There are two panels in this figure. The right side of the figure represents the comparison of predictive power for Canadian funds and the left side represents the comparison of predictive power for U.S. funds. There are four different out-of-sample performance measures and five different predictors for both countries. This figure displays how many of the regression coefficients are negative and significant using four different out-of-sample performance measures, to compare the predictive power of five different predictors.

Table 13 exhibits the summary of the regression analyses showing how the top-rated funds perform on average compared to the lower-rated funds, for five different predictors. Second column of this table shows different out-of-sample performance measures that we have used for the analysis. Column three to seven present the total number of regression coefficients for three sample periods (i.e., nine-years or seven-and-a-half-years, four-years and one-year) and four coefficients,(i.e., $\gamma_1, \gamma_2, \gamma_3, \gamma_4$) for each of the three out-of-sample periods.
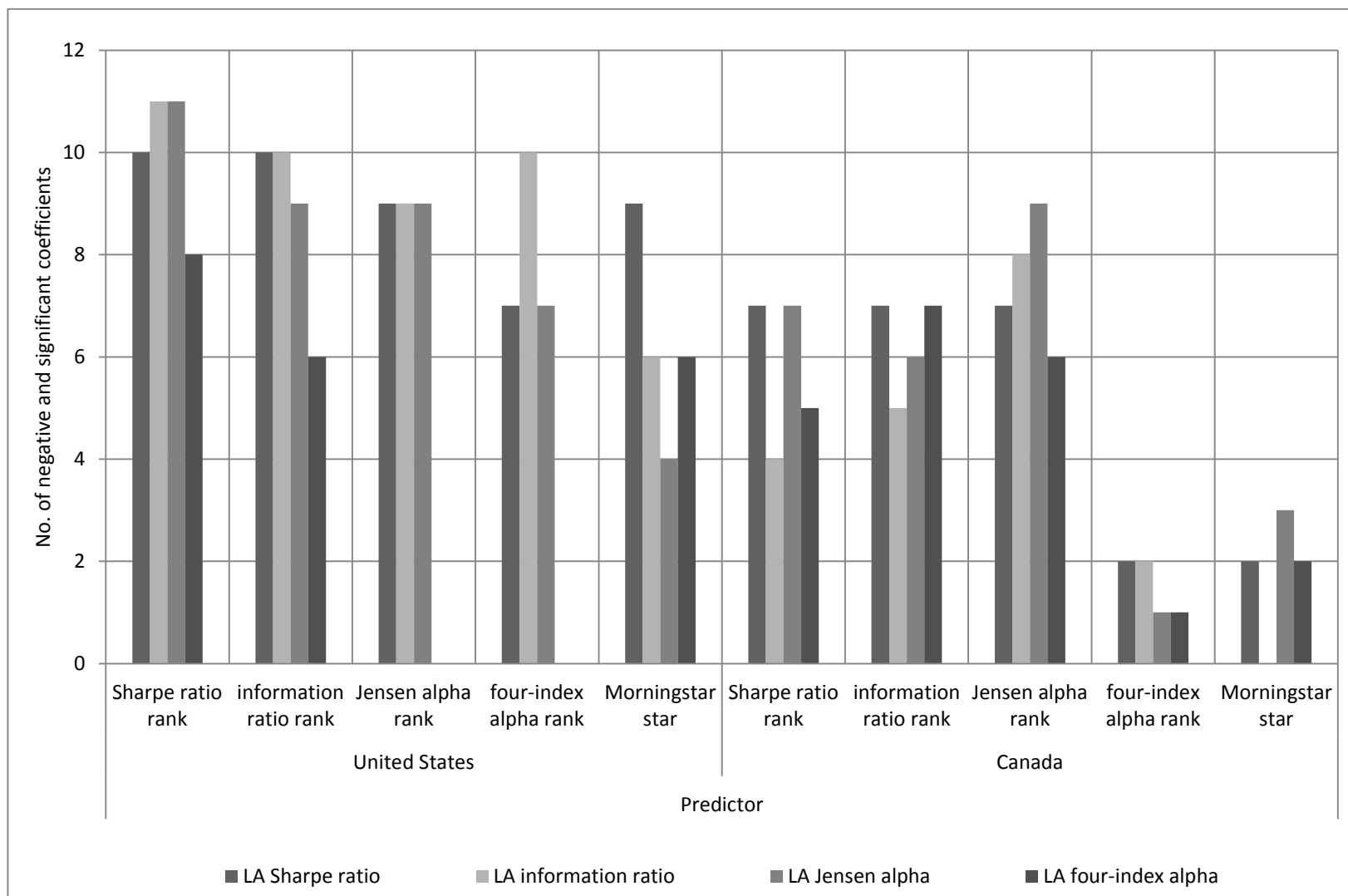
Figure 1. Comparisons of alternative predictors' rankings and Morningstar's new ratings for four performance measures

Table 13 shows a total of 12 regression coefficients for each out-of-sample performance measure and each predictor. There are four performance measures and five predictors in this table for both countries.

Table 13 Summary of the Regressions Analyses Using Morningstar's New Ratings and Alternative Predictors' Rankings as Predictor: U.S. and Canadian Complete Funds

Country	Out-of-sample performance measure	Types of Predictor				
		Sharpe ratio rank	Information ratio rank	Jensen alpha rank	Four-index alpha rank	Morningstar star
U.S.	Coefficient has correct sign (out of 12) using LA Sharpe ratio	12 (12)	12 (10)	11 (9)	8 (7)	12 (9)
	Coefficient has correct sign (out of 12) using LA information ratio	12 (11)	12 (11)	11 (9)	12 (10)	10 (7)
	Coefficient has correct sign (out of 12) using LA Jensen alpha	12 (12)	11 (9)	10 (9)	8 (7)	10 (6)
	Coefficient has correct sign (out of 12) using LA four-index alpha	11 (10)	9 (7)	6 (0)	6 (1)	11 (9)
Canada	Coefficient has correct sign (out of 12) using LA Sharpe ratio	10 (8)	11 (8)	11 (10)	7 (2)	9 (4)
	Coefficient has correct sign (out of 12) using LA information ratio	11 (5)	11 (6)	12 (10)	6 (2)	7 (1)
	Coefficient has correct sign (out of 12) using LA Jensen alpha	10 (8)	10 (9)	11 (10)	6 (2)	10 (3)
	Coefficient has correct sign (out of 12) using LA four-index alpha	11 (6)	11 (8)	12 (9)	6 (2)	9 (6)

Note. Significant cases are in parentheses. LA = Load Adjusted.

For U.S. complete funds, if we consider the load-adjusted (LA) Sharpe ratio, for instance, as the out-of-sample performance measure and information ratio's in-sample ratings of July 2002, as the predictor, the result shows that 12 out of 12 regression

coefficients are negative and 10 out of 12 is both negative and significant. Again, if we consider LA Sharpe ratio as the out-of-sample performance measure and Morningstar's in-sample ratings of July 2002 as the predictor, the results show that 12 out of 12 coefficients are negative and 9 out of 12 is both negative and significant. This result implies that, when we use load-adjusted Sharpe ratio as the performance measure, the new star ratings accurately predict for three fourth of the cases for the five star rated funds, which is almost similar as that of in-sample information ratio rankings.

Overall, for the United States, the total number of negative and significant coefficient estimates is 45 out of a total of 48 coefficients (94%) when we consider Sharpe ratio as the predictor. For other predictors, the total number of negative and significant coefficient estimates (out of a total of 48 cases) is 37 (77%) for the information ratio, 27 (56%) for the Jensen alpha, 25 (52%) for the four-index alpha, and 31 (65%) for the Morningstar ratings.

These results implies that the predictive power of new star ratings for the five-star rated funds is mixed compared to other predictors for the U.S. complete funds. Morningstar's new ratings predict better than Jensen alpha and four-index alpha while predict worse than Sharpe ratio and information ratio. However, the results also show that the direction of predictive power of the new star ratings for the five-star rated funds is correct for 90% cases.

We also perform the tests of differences in performance (i.e., Tests of differences of coefficients estimates) between four-, three-, two-, and one-star rated funds, to identify how the higher-rated funds perform on average compared to the lower-rated funds and maintain the expected inequality. We conduct this test for all five predictors to compare

their predictive power for four-, three-, two-, and one-star rated funds. In this test we identify whether the differences of the coefficient estimates are negative and significant or not. The results[53] show that, for U.S. complete funds, on average only 35% cases the direction is correct for the new star ratings. However, none of the differences of estimates are statistically significant, implies there is no differences in performance of these funds. This result also indicates that the predictive power of new star ratings for the four-, three-, two-, and one-star rated funds is low compared to four alternative predictors. These results further show that, the ability to predict the future performance of higher-rated funds (i.e. four- and three-star) is better on average, compared to the lower-rated funds (i.e. two- and one-star) for the four alternative predictors for U.S. complete funds.

Our result of regression analyses show some differences from Blake and Morey's (2000) study for U.S. funds, as they found that all the five predictors can only accurately predict the future performance of lower-rated funds.

On the other hand, for Canadian funds, the results of comparison of the predictive power of new star ratings for the five-star rated funds (Table 13) show that, the total number of negative and significant coefficient estimates is 27 as Sharpe ratio is the predictor (56%) out of a total of 48 coefficient estimates. The total number of negative and significant coefficients estimates for other predictors, such as for the information ratio is 31 (65%), Jensen alpha is 39 (81%), four-index alpha is 8 (17%), and Morningstar is 14 (29%). These results also indicates that the predictive power of new star ratings for the five-star rated funds is low compared to other predictors for the Canadian funds. Further, Morningstar's new ratings only predict better than four-index alpha. These

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[53] For details see Table E21 of Appendix E.

results also show that the direction of the new star ratings for the five-star rated funds is correct for 73% cases for the Canadian funds.

For Canadian funds, the results of the test of differences in performance between four-, three-, two-, and one-star rated funds shows that, on average only 74% cases the direction is correct for the new star ratings. However, only few of the (5%) differences are statistically significant, mostly for lower-rated funds, implies the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is low compared to four alternative predictors. These results further show that, the ability to predict the future performance of higher-rated funds are better on average, compared to the lower-rated funds for the other four alternative predictors for Canadian funds.

Table 14 shows the result of the Spearman-Rho rank correlation tests comparing the predictive power of the five different ratings systems. Here we examine the correlation of Morningstar's new ratings and four alternative predictors' rankings (in-sample rankings) with the out-of-sample rankings of four performance measures. A high correlation indicates good association between in-sample ratings and out-of-sample performance and better prediction of funds' future performance by Morningstar's new ratings (or alternative predictors' rankings).

The second column of Table 14 shows different out-of-sample performance measures for both countries. The third column represent the sample periods of the analysis. Column four to eight presents the correlation coefficients between in-sample ratings (either Morningstar's published ratings or four alterative predictors' rankings that we have calculated previously) and out-of-sample ratings using four performance measures.

The results of the rank correlation test show that, for U.S. funds the total number of positive and significant correlation coefficients is 12 for the Sharpe ratio, 12 for information ratio, 11 for Jensen alpha, 7 for four-index alpha, and 3 for the Morningstar's new ratings out of a total of 12 correlations. Whereas for Canadian funds, the number of positive and significant correlation coefficients is 10 for the Sharpe ratio, 10 for information ratio, 10 for Jensen alpha, 3 for four-index alpha, and 4 for the Morningstar's new ratings out of a total of 12 correlations.

There results of Table 14 indicate that the association between the ratings of Morningstar's new system (in-sample ratings) and those of the out-of-sample performance measures is low compared with four alternative predictors for both the United States and Canada, which implies that the predictive power of new star ratings is low compared to those of alternative predictors for both countries. However, the correlation values for Morningstar's new ratings are higher for Canadian funds than those of U.S. funds.

Our previous discussions of regression analyses suggest that the predictive power of Morningstar's new ratings for the five-star rated funds is mixed for U.S. funds and low for Canadian funds compared to four alternative predictors. New star ratings predict better than Jensen alpha and four-index alpha for U.S. complete funds and for only four-index alpha for Canadian complete funds for the five-star rated funds. Also, when we examine the direction of the new star ratings, the results show that the direction is correct for the five-star rated funds for most of the cases for both countries.

Table 14 Spearman-Rho Rank Correlation Test of Morningstar and Alternative Predictors Ratings as of July 2002 with Four

Performance Measures for U.S. and Canadian Complete Funds

Country	Out-of-sample performance measure	Out-of-sample period	Predictor type				
			Sharpe ratio rank	Information ratio rank	Jensen alpha rank	Four-index alpha rank	Morningstar star
U.S.	LA Sharpe ratio	Nine years	0.262**	0.248**	0.281**	0.146**	0.007
		Four years	0.398**	0.405**	0.284**	-0.045	0.063*
		One year	0.127**	0.085**	0.127**	0.291**	0.041
	LA information ratio	Nine years	0.299**	0.304**	0.363**	0.210**	-0.033
		Four years	0.411**	0.423**	0.399**	0.099**	-0.019
		One year	0.124**	0.083**	0.130**	0.296**	0.035
	LA Jensen alpha	Nine years	0.304**	0.294**	0.345**	0.190**	-0.027
		Four years	0.426**	0.437**	0.358**	0.009	0.035
		One year	0.110**	0.063*	0.121**	0.303**	0.041
	LA four-index alpha	Nine years	0.125**	0.080*	0.053	0.014	0.018
		Four years	0.198**	0.155**	0.093**	0.05	0.076*
		One year	0.205**	0.185**	0.065*	0.015	0.133**
Canada	LA Sharpe ratio	Seven and a half years	0.275**	0.298**	0.334**	0.001	0.064
		Four years	0.433**	0.462**	0.458**	0.125*	0.200**
		One year	0.074	0.073	0.072	0.112	0.001
	LA information ratio	Seven and a half years	0.182**	0.211**	0.297**	-0.071	-0.018
		Four years	0.207**	0.252**	0.340**	-0.07	-0.011
		One year	0.169*	0.173*	0.135*	0.158*	0.060
	LA Jensen alpha	Seven and a half years	0.277**	0.319**	0.361**	0.011	0.077
		Four years	0.415**	0.463**	0.481**	0.095	0.192**
		One year	0.074	0.067	0.058	0.109	0.022
	LA four-index alpha	Seven and a half years	0.214**	0.236**	0.257**	0.04	0.063
		Four years	0.355**	0.373**	0.374**	0.162*	0.191**
		One year	0.285**	0.302**	0.281**	0.111	0.159*

Note. * correlation is significant at the 5% level. ** correlation is significant at the 1% level.

LA = Load Adjusted

Moreover, when we compare the predictive power of five predictors for the four-, three-, two-, and one-star rated funds, the results show that the predictive power of new star ratings is lowest compared to four alternative predictors for both countries. Our findings of rank correlation test also suggest similar conclusions as that of regression analyses that, the predictive power of new star ratings is low compared to the alternative predictors.

In general, this comparative study demonstrates some differences with the previous study of Blake and Morey (2000) for the U.S. funds. They used Morningstar's old methodology rated funds and find that the predictive power of old star ratings is mixed (i.e., it predict better than two and predict worse than two alternative predictors). While we use the new methodology rated funds and our results show evidence that the predictive power of new star ratings for the five-star rated funds is also better than two alternative predictors. However, the predictive power of new star ratings for the four-, three-, two-, and one-star rated funds is lowest among five predictors.

3.3: Morningstar's New Ratings' Predictive Power in Bull and Bear Periods

In this section we report our findings concerning Morningstar's new ratings' predictive power in bull and bear economic periods for both the United States and Canada. We use regression analyses (Equation 9) and Spearman-Rho rank correlation tests for the analysis.

Table 15 provides the summary[54] results of regression analyses of four different performance measures using Morningstar (published) ratings as of January 2003 (bull period) and July 2007 (bear period) as predictors in two different economic periods for both U.S. and Canadian complete funds.

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[54] Detailed results of this analysis are provided in Appendix F.

For the United States, Table 15 shows that the total numbers of both negative and significant coefficient estimates are 13 (81%) out of a total of 16 coefficients for the bear period. For bull period, the number of both negative and significant coefficient is only two (12%) out of a total of 16 coefficients, implying the predictive power of new star ratings for the five-star rated funds is better for the bear period compared to the bull period. The direction of predictive power for the five-star ratted funds is also better for the bear period (100%) compared to the bull period (56%).

Table 15 Summary of Regressions Using Morningstar's New Ratings as Predictor: Comparison of Bull and Bear Periods using Complete Funds

Country	Coefficient has correct negative sign	Bull period	Bear period
U.S.	Total (out of 16)	9 (2)	16 (13)
	4-star funds (out of 4)	2 (0)	4 (1)
	3-star funds (out of 4)	3 (1)	4 (4)
	2-star funds (out of 4)	2 (1)	4 (4)
	1-star funds (out of 4)	2 (0)	4 (4)
Canada	Total (out of 16)	9 (4)	14 (4)
	4-star funds (out of 4)	2 (0)	4 (0)
	3-star funds (out of 4)	3 (1)	4 (1)
	2-star funds (out of 4)	3 (3)	4 (3)
	1-star funds (out of 4)	1 (0)	2 (0)

Note. Significant cases are in parentheses.

Further, the differences in performance[55] among four-, three-, two-, and one-star rated U.S. funds (i.e., the test of differences of the regression coefficients) show that, 75% cases the direction is correct for four-, three-, two-, and one-star rated funds for the bear period and 46% cases for the bull period. However, none of the differences of the coefficient estimates is significant for either period. These results suggest that the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is

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[55] For details see Table F9 of Appendix F.

low and it could not differentiate between the performances of these funds for either period.

For Canadian funds, the total numbers of both negative and significant coefficient estimates are only four (25%) for both the bear and the bull periods, implying that the predictive power of the new star ratings for the five-star rated funds is low and also the predictive power is similar for both economic periods. However, the direction of predictive power for the five-star rated funds is better for the bear period (88%) than that of the bull period (56%).

Moreover, the differences in performance[56] among four-, three-, two-, and one-star rated Canadian funds show that, 50% cases the direction is correct for four-, three-, two-, and one-star rated funds for the bear period and 58% cases for the bull period. However, only very few of the differences of the coefficient estimates are significant (12%) for only the bull period. These results suggest that the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is low and the new star ratings cannot differentiate between the performances of these funds in most of the cases for either period.

Table 16 shows the results of the Spearman-Rho rank correlation tests for the bull and bear periods for both the United States and Canada. This table shows that the association of the rankings between the Morningstar ratings (in-sample) and each of four performance measures (out-of-sample) is better for the bear period compared to bull period for both the countries, as the coefficients are higher (and also positive and significant) for the bear periods compared to the bull period. The correlation values are higher for Canadian bear period than those of U.S., indicating a better association

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[56] For details see Table F9 of Appendix F.

between in-sample new star ratings and out-of-sample rankings of performance measures

for Canadian funds (for both periods).

Table 16 Spearman-Rho Rank Correlation Tests of Morningstar's New Ratings for

January 2003 and July 2007 with Four Performance Measures for Bull and Bear Periods

Out-of-sample performance measure	United States		Canada	
	Bull period	Bear period	Bull period	Bear period
LA Sharpe ratio	0.043	0.087**	0.131*	0.141*
LA information ratio	-0.087**	0.082**	-0.059	0.108
LA Jensen alpha	0.029	0.085**	0.191**	0.177**
LA four-index alpha	0.076*	0.085**	0.184**	0.190**

Note. * correlation is significant at the 5% level.
** correlation is significant at the 1% level.
LA = Load Adjusted

Further, the correlation coefficients of the bull and bear periods for the Canadian

funds show that the association between the in-sample Morningstar's ratings and out-of-

sample ratings of four performance measures are similar, implying the predictive power

of new star ratings is similar for different economic periods, which we have also identify

into the regression analysis.

The earlier discussion of Morningstar's new star ratings' predictive power in bull

and bear periods indicates that the new star ratings predict better the out-of-sample

performance of five-star rated funds for the bear period compared to the bull period for

the U.S. funds. On the other hand, for Canadian funds, the predictive power of new star

ratings for the five-star rated funds is similar for both the bear and bull periods.

Moreover, the predictive power of new star ratings for four-, three-, two-, and one-star

rated funds is low for both countries. In most of the cases new star ratings could not

differentiate between the future performances of these funds for either period. Our

findings of rank correlation test also suggest similar conclusions as that of regression

analyses that, the predictive power of new star ratings is better for bear period compared to bull period for both countries.

3.4: Comparative Predictive Power of Old and New Star Rating Methods

In this section, we report the results of the comparison of predictive ability of the old and new star rating methods for both the United States and Canada to identify which method is better at predicting funds' future performance. We use regression analyses and Spearman-Rho rank correlation tests to perform the analysis.

Table 17 shows the summary results of the regression analyses for the four performance measures using Morningstar (published) ratings of July 2002 (new methodology) and June 1993 (old methodology) for U.S. complete funds or July 2002 (new methodology) and December 1994 (old methodology) for Canadian complete funds as the predictors.

Table 17 Summary of Regression Results Using Morningstar Ratings as Predictors: Comparison of Old and New Star Rating Methods for Complete Funds

Method	Coefficient has correct negative sign	United States			Canada		
		Nine years	Four years	One year	Seven and a half years	Four years	One year
New	Total (out of 16 or 12)	3 (0)	9 (1)	15 (7)	3 (0)	11 (7)	12 (6)
	4-star funds (out of 4)	1 (0)	2 (0)	4 (4)	2 (0)	4 (3)	4 (1)
	3-star funds (out of 4)	1 (0)	2 (0)	4 (3)	0 (0)	3 (2)	4 (4)
	2-star funds (out of 4)	0 (0)	2 (0)	4 (0)	1 (0)	4 (2)	4 (1)
	1-star funds (out of 4)	1 (0)	3 (1)	3 (0)	n/a	n/a	n/a
Old	Total (out of 16)	13 (1)	4 (3)	13 (4)	11 (5)	9 (0)	14 (2)
	4-star funds (out of 4)	4 (0)	0 (0)	1 (0)	4 (1)	4 (0)	4 (1)
	3-star funds (out of 4)	3 (0)	0 (0)	4 (0)	4 (4)	4 (0)	4 (0)
	2-star funds (out of 4)	3 (0)	2 (1)	4 (0)	3 (0)	1 (0)	4 (1)
	1-star funds (out of 4)	3 (1)	2 (2)	4 (4)	0 (0)	0 (0)	2 (0)

Note. Significant cases are in parentheses.
There was no one-star rated funds in the new methodology rated funds for Canadian sub-sample. So, we removed the γ_4 or one-star from the analysis for this subsample.

If we compare the total number of both negative and significant coefficient estimates for both the old and new star rating methods for the U.S. complete funds, the results show that both old and new star rating methods better predict for short-term sample period compared to mid- and long-term periods for the five-star rated funds. Further, the direction of predictive power for the five-star rated funds is also better for short-term period than other sample periods for both methods, on average. These results also show that the total numbers of both negative and significant coefficient estimates are similar for both old and new star ratings for the five-star rated funds.

Moreover, when we consider the differences in performance among[57] four-, three-, two-, and one-star rated U.S. funds, results show that the direction of predictive power is better for old ratings (75% correct) compared to new ratings (35% correct) for the four-, three-, two-, and one-star rated funds. However, only 19% cases the differences of the coefficient estimates are significant for only old star ratings method and mostly for lower-rated funds. This implies that the old star ratings can only predict the lower-rated funds (i.e., one- and two-star rated) to some extends, which is accord with Blake and Morey (2000) and Gerrans (2006). These results further suggest that, the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is low, as most of the coefficient estimates are not significantly different in any pair for new star ratings, which we have also found in earlier analysis.

For Canadian funds, if we consider the total number of both negative and significant coefficients for both the new and old star rating methodologies, the results show that the new star ratings predict better for the mid- and short-term periods compared to long-term period, and old star ratings predict better for the long-term period compared

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[57] For details see Table G25 of Appendix G.

to mid- and short-term periods for the five-star rated funds. Further, the direction of predictive power for five-star rated funds is better for short-term period than other sample periods for both methods, on average.

Again, if we consider the differences in performance among four-, three-, two-, and one-star rated Canadian funds, results show that the direction is better for new ratings (36% correct) compared to old ratings (11% correct) for the four-, three-, two-, and one-star rated funds. However, none of the differences of the coefficient estimates is significant in either method. These results suggest that the predictive power of both old and new star ratings for four-, three-, two-, and one-star rated funds is low and the both of the star ratings could not differentiate between the performances of four-, three-, two-, and one-star rated funds for either method.

Table 18 Spearman-Rho Rank Correlation Tests of Morningstar Ratings of July 2002 and June 1993 (for U.S.) or December 1994 (for Canada) with Four Performance Measures: Comparison Between New and Old Morningstar Methodologies

Types of method	Out-of-sample performance measure	United States			Canada		
		Nine years	Four years	One year	Seven and a half year	Four years	One year
New	LA Sharpe ratio	0.008	0.087	0.005	-0.022	0.223*	0.124
	LA information ratio	-0.04	-0.009	-0.002	-0.096	-0.023	0.176
	LA Jensen alpha	-0.037	0.03	0.003	0.015	0.287*	0.123
	LA four-index alpha	0.024	0.106*	0.097*	-0.051	0.126	0.297*
Old	LA Sharpe ratio	0.075	0.176**	0.146**	-0.052	-0.308*	-0.03
	LA information ratio	-0.053	0.008	0.143**	0.002	-0.255*	0.061
	LA Jensen alpha	0.001	0.129*	0.127*	0.052	-0.257*	-0.01
	LA four-index alpha	-0.017	-0.062	0.156**	-0.004	-0.036	-0.235*

Note. * correlation is significant at the 5% level.
         ** correlation is significant at the 1% level
         LA = Load Adjusted

Table 18 show the results of the Spearman-Rho rank correlation tests of the Morningstar ratings of July 2002 (new) and June 1993 (old) for the United States or July 2002 (new) and December 1994 (old) for Canada (in-sample rankings) with four performance measures (out-of-sample rankings) for a comparison of the predictive ability of the new and old star-ratings.

Table 18 shows that for U.S. funds, there are eight positive and significant correlation coefficients (two for new method and six for old method) exist out of a total of 24 correlations for both new and old rating methods together. All of these significant correlations are present either in the mid- or short-term sample periods for both methods. This implies that the predictive power of both new and old star rating methods is better for the mid- and short-term sample periods compared to the long-term period. Further, if we compare the correlations between the load-adjusted (LA) Sharpe ratio performance measure and either old or new star rating methods, for instance, the result shows that the correlation coefficients are higher for the old ratings method compared to the new ratings, implying the in-sample ratings of old methodology better associates with the out-of-sample rankings of Sharpe ratio compared to the new star ratings for all three sample periods. However, this better association of the old methodology with the out-of-sample rankings is not persistent for all performance measures.

Again, for Canadian funds, table 18 shows that there are only three instances of positive and significant correlation coefficients (all for new method) out of a total 24 correlations for both methods together. However, high negative correlations do not correctly predict better future performance of funds. The overall results of the Canadian funds show better association between Morningstar's new ratings' (in-sample ratings) for

short- and mid-term periods and out-of-sample rankings of four performance measures. Again, in case of old ratings, better association exists for only long-term sample period.

The prior discussions of regression analyses suggest that on average, the predictive power of old and new star ratings are similar for the five-star rated U.S. complete funds. Moreover, the predictive power for four-, three-, two-, and one-star rated funds is low for both rating methods and in most of the cases the star ratings cannot distinguish between the performances of these funds for either method for U.S. funds. For Canadian funds, new star ratings predict better than the old star ratings for the five-star rated funds. Further, the predictive power for four-, three-, two-, and one-star rated funds is also low for both rating methods and they cannot distinguish between the performances of these funds for either method. However, the difference in predictive power between old and new rating methods is not so vast for both countries.

Further, the rank correlation tests also suggest similar conclusion about the comparison of the predictive power of old and new star rating methods. Old star ratings predict better for U.S. funds compared to new star ratings, while new star ratings predict better for Canadian funds compared to old star ratings.On average, Morningstar's both ratings predicts better for short- and mid-term periods compared to long-term period for U.S. funds. For Canada, new ratings better predict for short- and mid-term periods and old ratings better predict for long-term period.

<div align="center">4.0 Conclusion</div>

The purpose of this thesis is to examine the predictive power of Morningstar's new ratings and to compare its predictive ability with four alternative predictors. We also analyze the predictive capacity of the new star ratings for bull and bear periods. Furthermore, we perform a comparative study of the predictive power of new and old star rating methods. The existing performance literature does not cover all the aspects of this study. No previous study has considered Canadian equity funds. This study is an attempt to fill these gaps in the literature.

This study uses regression analyses and Spearman-Rho rank correlation tests to examine the performance of Morningstar ratings for both the U.S. and Canadian equity funds. The data for the U.S. market range from 1992 to 2011 and for the Canadian market from 1993 to 2009.

The results of our study show that:

1. Morningstar's new ratings can accurately predict the future performance of five-star rated funds for short- and mid-term periods for U.S. complete funds. For Canadian complete funds, the new star ratings can accurately predict the future performance of five-star rated funds for mid-term period only. The new star ratings cannot distinguish between the performance of four-, three-, two- and one-star rated funds in most of the cases for both U.S. and Canadian complete funds. The rank correlation tests also suggest that the new star ratings predict accurately for only one fourth of the cases for U.S. complete funds and only one third of the cases for Canadian complete funds. Further, the predictive power of

the new star ratings is better for mid- and short-term sample periods compared to long-term period for both countries.

In case of periodic funds, the new star ratings accurately predict the future performance of five-star rated funds for less than half of the cases for the United States and more than one fourth of the cases for Canada for both mid- and short-term sample periods. Also, the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is low for the periodic funds of both countries, as the new star ratings, in general cannot differentiate between the performance of these funds for both countries. However, the direction of predictive power for all the funds (i.e., five-, four-, three-, two-, and one-star rated funds) is correct for most of the cases for both countries. Our results of rank correlation test also suggest that the predictive power of new star ratings is better for mid- and short-term sample periods compared to long-term period for both countries. New star ratings accurately predict the future performance of less than half of the cases for both U.S. and Canadian periodic funds.

In sum, the new star ratings accurately predict out-of-sample performance of only five-star rated complete funds for short- and medium-term periods for U.S. funds, and for medium-term period only for Canadian funds. The results of our study are consistent with the study of Kräussl & Sandelowsky (2007) for U.S. funds about the predictive power of new star ratings. However, our study does not support the claim of Morey and Gottesman (2006) that the new star ratings accurately predict the out-of-sample performance of all funds in all cases.

2. The comparative predictive power of the Morningstar's new ratings with four alternative predictors suggest that, the new star ratings predict better than Jensen alpha and four-index alpha for the five-star rated U.S. complete funds. For Canadian complete funds, the new star ratings can predict better than four-index alpha only for five-star rated funds. Also, the predictive power of new star ratings for four-, three-, two-, and one-star rated funds is lowest among five predictors for both countries. This finding is persistent over different sample periods. Our results of rank correlation test also suggest that the predictive power of new star ratings is low compared to four alternative predictors.

3. The new star ratings better predicts the out-of-sample performance of five-star rated funds for the bear periods compared to the bull periods for the U.S. funds. However, the predictive power of new star ratings for five-star rated funds is similar for both economic periods for Canadian funds. Further, the predictive ability of new star ratings is low for four-, three-, two-, and one-star rated funds for both periods and for both countries. Our results of correlation test also show that the predictive ability of new star ratings is better for the bear period compared to the bull period for both U.S. and Canadian funds.

4. The comparison of predictive power of new and old star-rating methods show that, for U.S. complete funds both old and new methods predict similarly for five-star rated funds. Further, there is some evidence that the old star ratings relatively better predict four-, three-, two-, and one-star rated funds than that of new star ratings. While for Canadian funds, the new star ratings better predict the future performance of the five-star rated funds than the old star ratings. Also,

the predictive ability for the four-, three-, two-, and one-star rated funds is low

for both old and new rating methods for Canadian funds.

Our results of rank correlation tests show some evidence that the old star

ratings predict better than the new ratings for U.S. complete funds. For Canadian

complete funds, new star ratings predict better than the old ratings. In general,

our results of the U.S. funds are consistent with the study of Kräussl &

Sandelowsky (2007).

In summary, the present study suggests Morningstar's new ratings accurately rank

funds and predict out-of-sample performance of only five-star rated complete funds for

short- and medium-terms for U.S., and for medium-term only for Canada. On the other

hand, the predictive power of new star ratings for the four-, three-, two-, and one-star

rated funds is low for both countries. Also, predictive power of Morningstar's new

ratings is low compared to four alternative predictors for both U.S. and Canadian funds,

on average. Further, the new star ratings predict better for bear period compared to bull

period for both countries. Moreover, the comparison of predictive power of new and old

star ratings show some evidence that the old star ratings relatively predict better

compared to the new star ratings for U.S. funds and the new ratings relatively predict

better for Canadian funds compared to old star ratings.

Although there are some differences between the markets structure of U.S. and

Canadian mutual funds, the trends of the predictive power of Morningstar ratings' is

almost indistinguishable for both countries.

These findings have implications for mutual fund managers and investors in the

sense that, they can use the new star ratings to identify and understand the future

performance of five-star rated funds for short- and medium-term periods. The new star ratings cannot differentiate between the performance of four-, three-, two-, and one –star rated funds. The results also help investors and fund managers to select right mutual funds suited for individual preferences.

This study can be extended by examining all the funds of domestic and international equity, stocks, bonds, specialty stocks and bonds, municipal bonds, and different types of load and non-load funds. The present study could also be extended with different data set, different time frames. The rank correlation test can also be extended by dividing the rank data into deciles for more specific test. A future study could also use different alternative predictors.

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Appendix – A

Table A1.

Morningstar's Fund-Category System

Diversified Domestic Stock	Large Value Large Blend Large Growth Mid-Cap Value Mid-Cap Blend	Mid-Cap Growth Small Value Small Blend Small Growth
International Stock	Europe Stock Latin America Stock Diversified Emerging Markets Diversified Pacific Stock Pacific Stock ex-Japan Japan Stock	Foreign Large Blend Foreign Large Growth Foreign Large Value Foreign Small/Mid Growth Foreign Small/Mid Value World Stock
Specialty Stock	Communications Financial Health Natural Resources	Precious Metals Real Estate Technology Utilities
Hybrid	Conservative Allocation Moderate Allocation	Bear Market Convertibles
Specialty Bond	High-Yield Bond Multi-sector Bond International Bond	Emerging Markets Bond Bank Loan
General Bond	Long-Term Bond Intermediate-Term Bond	Short-Term Bond Ultrashort Bond
Government Bond	Long-Term Government Intermediate-Term Government	Short-Term Government
Municipal Bond	Muni National Long Muni National Intermediate Muni National Short Muni High-Yield Muni Single-State Long Muni Single-State Intermediate Muni Single-State Short Muni CA Long	Muni CA Intermediate/Short Muni NY Long Muni NY Intermediate/Short Muni Florida Muni Massachusetts Muni Minnesota Muni New Jersey Muni Ohio Muni Pennsylvania

Note. Adapted from Morningstar guide to mutual funds: five-Star strategies for success (Benz, 2005)

<div align="center">Appendix – B</div>

Morningstar Style Box[58]

  Morningstar developed its investment style box in 1992 to help investors choose funds based on what the funds really own rather than what the funds call themselves. This style box provides an immediate summary of a particular mutual fund's portfolio, where most of the fund's portfolio is invested. In the Morningstar style box for equity funds, Morningstar consider two key factors: market capitalization of the company (whether the company is a large, medium or small) and the investment style of that specific company (i.e., growth stock or value stock or blend of growth and value stocks). These two factors form the two axes of the equity style box.

Figure B1. The Morningstar equity style box

Level of Risk		Investment Style			Average Market Capitalization
		Value	Blend	Growth	
Low	○	Large-Cap Value	Large-Cap Blend	Large-Cap Growth	Large
Moderate	○	Mid-Cap Value	Mid-Cap Blend	Mid-Cap Growth	Medium
High	●	Small-Cap Value	Small-Cap Blend	Small-Cap Growth	Small

  But in the case of bond funds, they consider other two factors: interest-rates sensitivity of the fund and the credit quality of the bonds in which it invests. Those two factors form the two axes of the bond fund style box. The style box allows investors to promptly estimate the risk exposure of their fixed income fund. In both of the style boxes, level of risk also forms another axes. In the case of a bond fund, understanding a bond fund's interest-rate sensitivity helps investors determine how much it will react when interest rates go up or down.

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[58] Adopted from: Morningstar guide to mutual funds: five-star strategies for success (Benz, 2005).

Figure B2. The Morningstar bond style box

Level of Risk		Short	Duration Intermediate	Long	Credit Quality
Low	○	High Short	High Interm.	High Long	High
Moderate	○	Med Short	Med. Interm.	Med Long	Medium
High	●	Low Short	Low Interm.	Low Long	Low

The Morningstar style box is only a quick glimpse of the fund's most recent portfolio.

<p style="text-align:center"><u>Appendix – C</u></p>

U.S. Complete Funds:

Table C1.

Regression Analysis Using Morningstar Star as Predictor: Nine-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.107* (27.534)	-0.005 (-1.072)	-0.009* (-1.955)	0.000 (-0.072)	-0.006 (-0.764)	1.636	0.003
Non LA information ratio	0.039* (9.018)	-0.006 (-1.165)	-0.007** (-1.479)	0.004 (0.706)	0.001 (0.093)	2.131**	0.006
Non LA Jensen alpha	0.200* (8.131)	-0.024 (-0.796)	-0.037** (-1.307)	0.034 (1.067)	0.010 (0.200)	2.294**	0.007
Non LA four-index alpha	0.081* (3.517)	-0.013 (-0.472)	-0.042** (-1.572)	0.022 (0.749)	-0.029 (-0.644)	2.096**	0.006
LA Sharpe ratio	0.107* (27.532)	-0.005 (-1.072)	-0.009* (-1.956)	-0.000 (-0.073)	-0.006 (-0.764)	1.636	0.003
LA information ratio	0.039* (9.010)	-0.006 (-1.167)	-0.007** (-1.482)	0.004 (0.703)	0.001 (0.092)	2.132**	0.006
LA Jensen alpha	0.200* (8.131)	-0.024 (-0.798)	-0.037** (-1.291)	0.034 (1.064)	0.010 (0.199)	2.263**	0.007
LA four-index alpha	0.081* (3.517)	-0.013 (-0.473)	-0.042** (-1.553)	0.022 (0.748)	-0.029 (-0.645)	2.058**	0.005

Note. Sample size of 768 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2011. *t*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table C2.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.206* (27.189)	-0.019* (-2.108)	-0.029* (-3.261)	-0.018* (-1.827)	-0.026* (-1.737)	2.767*	0.009
Non LA information ratio	0.065* (7.828)	-0.020* (-1.942)	-0.020* (-2.077)	-0.002 (-0.180)	-0.002 (-0.092)	2.279**	0.007
Non LA Jensen alpha	0.325* (7.852)	-0.080** (-1.597)	-0.105* (-2.187)	-0.024 (-0.439)	-0.085 (-1.036)	1.736	0.004
Non LA four-index alpha	0.091* (2.975)	-0.063* (-1.705)	-0.096* (-2.704)	-0.052** (-1.332)	-0.107* (-1.786)	2.089**	0.006
LA Sharpe ratio	0.206* (27.186)	-0.019* (-2.109)	-0.029* (-3.262)	-0.018* (-1.827)	-0.026* (-1.738)	2.768*	0.009
LA information ratio	0.065* (7.816)	-0.020* (-1.945)	-0.020* (-2.081)	-0.002 (-0.184)	-0.002 (-0.093)	2.283**	0.007
LA Jensen alpha	0.325* (7.853)	-0.080** (-1.599)	-0.105* (-2.191)	-0.024 (-0.443)	-0.085 (-1.038)	1.738	0.004
LA four-index alpha	0.090* (2.974)	-0.063* (-1.706)	-0.096* (-2.706)	-0.053** (-1.334)	-0.107* (-1.788)	2.091**	0.006

Note. Sample size of 768 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2006. *t*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table C3.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.055* (5.617)	-0.054* (-4.578)	-0.051* (-4.464)	-0.044* (-3.455)	-0.042* (-2.199)	5.977*	0.025
Non LA information ratio	0.044* (4.529)	-0.054* (-4.541)	-0.050* (-4.356)	-0.042* (-3.335)	-0.040* (-2.077)	5.803*	0.024
Non LA Jensen alpha	0.254* (4.123)	-0.273* (-3.670)	-0.246* (-3.435)	-0.187* (-2.350)	-0.114 (-0.943)	3.968*	0.015
Non LA four-index alpha	0.308* (4.894)	-0.309* (-4.051)	-0.324* (-4.424)	-0.316* (-3.881)	-0.350* (-2.817)	5.626*	0.024
LA Sharpe ratio	0.055* (5.613)	-0.054* (-4.579)	-0.051* (-4.465)	-0.044* (-3.457)	-0.042* (-2.200)	5.981*	0.025
LA information ratio	0.044* (4.524)	-0.054* (-4.542)	-0.050* (-4.359)	-0.042* (-3.337)	-0.040* (-2.078)	5.808*	0.024
LA Jensen alpha	0.254* (4.123)	-0.273* (-3.673)	-0.246* (-3.440)	-0.187* (-2.353)	-0.114 (-0.939)	3.979*	0.015
LA four-index alpha	0.308* (4.895)	-0.308* (-4.055)	-0.324* (-4.430)	-0.316* (-3.884)	-0.349* (-2.818)	5.637*	0.024

Note. Sample size of 768 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2003. *t*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

Table C4.

Tests of Differences in Coefficients: Nine-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.004	0.005	-0.001	0.009	0.003	-0.006
	(-0.5657)	(0.7071)	(-0.106)	(1.2728)	(0.318)	(-0.636)
Non LA information ratio	-0.001	0.01	0.007	0.011	0.008	-0.003
	(-0.1414)	(1.2804)	(0.742)	(1.4084)	(0.848)	(-0.3)
Non LA Jensen alpha	-0.013	0.058	0.034	0.071	0.047	-0.024
	(-0.3116)	(1.3223)	(0.5918)	(1.6441)	(0.8255)	(-0.4101)
Non LA four-index alpha	-0.029	0.035	-0.016	0.064	0.013	-0.051
	(-0.7456)	(0.8529)	(-0.2971)	(1.5857)	(0.2437)	(-0.9287)
LA Sharpe ratio	-0.004	0.005	-0.001	0.009	0.003	-0.006
	(-0.5657)	(0.7071)	(-0.106)	(1.2728)	(0.318)	(-0.636)
LA information ratio	-0.001	0.01	0.007	0.011	0.008	-0.003
	(-0.1414)	(1.2803)	(0.742)	(1.4084)	(0.848)	(-0.3)
LA Jensen alpha	-0.013	0.058	0.034	0.071	0.047	-0.024
	(-0.3116)	(1.3223)	(0.5918)	(1.6441)	(0.8255)	(-0.4101)
LA four-index alpha	-0.029	0.035	-0.016	0.064	0.013	-0.051
	(-0.7456)	(0.8529)	(-0.2971)	(1.5857)	(0.2437)	(-0.9287)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table C1. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

Table C5.

Tests of Differences in Coefficients: Four-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.01	0.001	-0.007	0.011	0.003	-0.008
	(-0.7857)	(0.0743)	(-0.4002)	(0.8176)	(0.1715)	(-0.4438)
Non LA information ratio	0	0.018	0.018	0.018	0.018	0
	(0)	(1.2108)	(0.954)	(1.2108)	(0.954)	(0)
Non LA Jensen alpha	-0.025	0.056	-0.005	0.081	0.02	-0.061
	(-0.3607)	(0.7609)	(-0.0521)	(1.1211)	(0.2105)	(-0.6213)
Non LA four-index alpha	-0.033	0.011	-0.044	0.044	-0.011	-0.055
	(-0.6479)	(0.2046)	(-0.6242)	(0.8397)	(-0.1584)	(-0.7686)
LA Sharpe ratio	-0.01	0.001	-0.007	0.011	0.003	-0.008
	(-0.7857)	(0.0743)	(-0.4002)	(0.8176)	(0.1715)	(-0.4438)
LA information ratio	0	0.018	0.018	0.018	0.018	0
	(0)	(1.2108)	(0.954)	(1.2108)	(0.954)	(0)
LA Jensen alpha	-0.025	0.056	-0.005	0.081	0.02	-0.061
	(-0.3607)	(0.7609)	(-0.0521)	(1.1211)	(0.2105)	(-0.6213)
LA four-index alpha	-0.033	0.01	-0.044	0.043	-0.011	-0.054
	(-0.6479)	(0.186)	(-0.6242)	(0.8206)	(-0.1584)	(-0.7546)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table C2. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

Table C6.

Tests of Differences in Coefficients: One-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.003	0.01	0.012	0.007	0.009	0.002
	(0.1843)	(0.5652)	(0.5339)	(0.4111)	(0.4099)	(0.0869)
Non LA information ratio	0.004	0.012	0.014	0.008	0.01	0.002
	(0.2457)	(0.6782)	(0.6229)	(0.4698)	(0.4555)	(0.0869)
Non LA Jensen alpha	0.027	0.086	0.159	0.059	0.132	0.073
	(0.2615)	(0.7892)	(1.1210)	(0.5482)	(0.9375)	(0.5033)
Non LA four-index alpha	-0.015	-0.007	-0.041	0.008	-0.026	-0.034
	(-0.1423)	(-0.0626)	(-0.2819)	(0.0729)	(-0.1807)	(-0.2287)
LA Sharpe ratio	0.003	0.01	0.012	0.007	0.009	0.002
	(0.1843)	(0.5652)	(0.5339)	(0.4111)	(0.4099)	(0.0869)
LA information ratio	0.004	0.012	0.014	0.008	0.01	0.002
	(0.2457)	(0.6783)	(0.6229)	(0.4698)	(0.4555)	(0.0869)
LA Jensen alpha	0.027	0.086	0.159	0.059	0.132	0.073
	(0.2633)	(0.7892)	(1.1210)	(0.5516)	(0.9409)	(0.5033)
LA four-index alpha	-0.016	-0.008	-0.041	0.008	-0.025	-0.033
	(-0.1518)	(-0.0720)	(-0.2819)	(0.0734)	(-0.1737)	(-0.2228)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table C3. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

Canada Complete fund:

Table C7.

Regression Analysis Using Morningstar Star as Predictor: Seven-and-a-Half-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.097* (9.606)	0.003 (0.241)	0.005 (0.393)	0.001 (0.049)	-0.032 (-1.237)	0.562	-0.010
Non LA information ratio	-0.009 (-0.817)	0.009 (0.606)	0.014 (0.979)	0.015 (0.924)	-0.0000 (-0.003)	0.332	-0.016
Non LA Jensen alpha	0.052 (1.013)	0.021 (0.318)	0.012 (0.179)	-0.004 (-0.051)	-0.136 (-1.046)	0.401	-0.014
Non LA four-index alpha	0.006 (0.139)	0.041 (0.759)	0.044 (0.817)	0.019 (0.322)	-0.149** (-1.387)	1.002	0.000
LA Sharpe ratio	0.097* (9.580)	0.003 (0.244)	0.005 (0.396)	0.000 (0.012)	-0.032 (-1.236)	0.566	-0.010
LA information ratio	-0.010 (-0.860)	0.009 (0.614)	0.014 (0.987)	0.014 (0.876)	-0.000 (-0.004)	0.320	-0.016
LA Jensen alpha	0.051 (1.00)	0.021 (0.320)	0.012 (0.183)	-0.004 (-0.050)	-0.136 (-1.051)	0.406	-0.014
LA four-index alpha	0.005 (0.121)	0.041 (0.763)	0.044 (0.822)	0.019 (0.324)	-0.149** (-1.388)	1.008	0.000

Note. Sample size of 176 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to December 2009. *t*-statistics are in the parentheses.

LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table C8.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.281* (15.720)	-0.033** (-1.431)	-0.036** (-1.574)	-0.057* (-2.233)	-0.099* (-2.173)	1.907	0.020
Non LA information ratio	-0.009 (-0.451)	-0.005 (-0.189)	0.010 (0.372)	0.003 (0.111)	0.012 (0.234)	0.115	-0.021
Non LA Jensen alpha	0.219* (2.838)	-0.118 (-1.194)	-0.168* (-1.708)	-0.236* (-2.165)	-0.352* (-1.795)	1.644	0.015
Non LA four-index alpha	0.122* (2.260)	-0.084 (-1.208)	-0.094** (-1.357)	-0.184* (-2.402)	-0.272* (-1.971)	1.947	0.021
LA Sharpe ratio	0.281* (15.714)	-0.033** (-1.429)	-0.036** (-1.571)	-0.060* (-2.357)	-0.099* (-2.174)	2.023**	0.023
LA information ratio	-0.010 (-0.509)	-0.005 (-0.174)	0.010 (0.386)	-0.002 (-0.064)	0.012 (0.232)	0.124	-0.020
LA Jensen alpha	0.217* (2.831)	-0.117 (-1.194)	-0.168* (-1.707)	-0.235* (-2.167)	-0.353* (-1.802)	1.650	0.015
LA four-index alpha	0.121* (2.249)	-0.083 (-1.208)	-0.094** (-1.357)	-0.183* (-2.403)	-0.272* (-1.976)	1.951	0.021

Note. Sample size of 176 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2006. *t*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table C9.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	-0.101* (-4.467)	-0.018 (-0.609)	-0.020 (-0.682)	-0.010 (-0.310)	-0.000 (-0.005)	0.152	-0.020
Non LA information ratio	0.012 (0.535)	-0.031 (-1.098)	-0.038** (-1.326)	-0.039 (-1.219)	-0.050 (-0.873)	0.573	-0.010
Non LA Jensen alpha	-0.045 (-0.521)	-0.105 (-0.953)	-0.073 (-0.660)	-0.033 (-0.266)	-0.097 (-0.438)	0.269	-0.017
Non LA four-index alpha	0.060 (0.642)	-0.104 (-0.869)	-0.152 (-1.275)	-0.186** (-1.399)	-0.370** (-1.556)	0.919	-0.002
LA Sharpe ratio	-0.102* (-4.482)	-0.018 (-0.605)	-0.020 (-0.677)	-0.010 (-0.306)	-0.000 (-0.005)	0.150	-0.020
LA information ratio	0.012 (0.544)	-0.031 (-1.100)	-0.038** (-1.329)	-0.039 (-1.221)	-0.050 (-0.873)	0.575	-0.010
LA Jensen alpha	-0.045 (-0.527)	-0.105 (-0.955)	-0.073 (-0.663)	-0.033 (-0.271)	-0.097 (-0.440)	0.269	-0.017
LA four-index alpha	0.059 (0.635)	-0.103 (-0.870)	-0.152 (-1.275)	-0.186** (-1.403)	-0.370** (-1.561)	0.924	-0.002

Note. Sample size of 176 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2003. *t*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table C10.

Tests of Differences in Coefficients: Seven-and-a-Half-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.002	-0.002	-0.035	-0.004	-0.037	-0.033
	(0.1088)	(-0.1047)	(-1.204)	(-0.2094)	(-1.2728)	(-1.1175)
Non LA information ratio	0.005	0.006	-0.0091	0.001	-0.0141	-0.0151
	(0.2525)	(0.2822)	(-0.2899)	(0.047)	(-0.4496)	(-0.4674)
Non LA Jensen alpha	-0.009	-0.025	-0.157	-0.016	-0.148	-0.132
	(-0.0979)	(-0.2577)	(-1.0980)	(-0.1649)	(-1.0183)	(-0.8882)
Non LA four-index alpha	0.003	-0.022	-0.19**	-0.025	-0.193**	-0.168**
	(0.0393)	(-0.2725)	(-1.5735)	(-0.3097)	(-1.5984)	(-1.3598)
LA Sharpe ratio	0.002	-0.003	-0.035	-0.005	-0.037	-0.032
	(0.1088)	(-0.1570)	(-1.204)	(-0.2617)	(-1.2728)	(-1.0837)
LA information ratio	0.005	0.005	-0.009	0	-0.014	-0.014
	(0.2525)	(0.2352)	(-0.2875)	(0)	(-0.4472)	(-0.4341)
LA Jensen alpha	-0.009	-0.025	-0.157	-0.016	-0.148	-0.132
	(-0.0979)	(-0.2577)	(-1.0802)	(-0.1649)	(-1.0183)	(-0.8882)
LA four-index alpha	0.003	-0.022	-0.19**	-0.025	-0.193**	-0.168**
	(0.0393)	(-0.2725)	(-1.5853)	(-0.3097)	(-1.6103)	(-1.3695)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table C7. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table C11.

Tests of Differences in Coefficients: Four-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.003	-0.024	-0.066**	-0.021	-0.063	-0.042
	(-0.0922)	(-0.7065)	(-1.2833)	(-0.6182)	(-1.225)	(-0.8022)
Non LA information ratio	0.015	0.008	0.017	-0.007	0.002	0.009
	(0.4079)	(0.2054)	(0.2970)	(-0.1797)	(0.0349)	(0.1534)
Non LA Jensen alpha	-0.05	-0.118	-0.234	-0.068	-0.184	-0.116
	(-0.3608)	(-0.8050)	(-1.0678)	(-0.4639)	(-0.8397)	(-0.5172)
Non LA four-index alpha	-0.01	-0.1	-0.188	-0.09	-0.178	-0.088
	(-0.1025)	(-0.9672)	(-1.2185)	(-0.8705)	(-1.1537)	(-0.5569)
LA Sharpe ratio	-0.003	-0.027	-0.066**	-0.024	-0.063	-0.039
	(-0.0922)	(-0.7948)	(-1.2833)	(-0.7065)	(-1.225)	(-0.7449)
LA information ratio	0.015	0.003	0.017	-0.012	0.002	0.014
	(0.4076)	(0.0770)	(0.2924)	(-0.3081)	(0.0344)	(0.2351)
LA Jensen alpha	-0.051	-0.118	-0.236	-0.067	-0.185	-0.118
	(-0.368)	(-0.8050)	(-1.077)	(-0.4571)	(-0.8442)	(-0.5262)
LA four-index alpha	-0.011	-0.1	-0.189	-0.089	-0.178	-0.089
	(-0.1127)	(-0.9742)	(-1.225)	(-0.867)	(-1.1537)	(-0.5649)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table C8. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table C12.

Tests of Differences in Coefficients: One-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.002	0.008	0.018	0.01	0.02	0.01
	(-0.0488)	(0.1852)	(0.2776)	(0.2316)	(0.3084)	(0.1509)
Non LA information ratio	-0.007	-0.008	-0.019	-0.001	-0.012	-0.011
	(-0.1707)	(-0.1853)	(-0.2971)	(-0.0232)	(-0.1876)	(-0.1683)
Non LA Jensen alpha	0.032	0.072	0.008	0.04	-0.024	-0.064
	(0.2039)	(0.4345)	(0.0324)	(0.2414)	(-0.097)	(-0.253)
Non LA four-index alpha	-0.048	-0.082	-0.266	-0.034	-0.218	-0.184
	(-0.2852)	(-0.4595)	(-0.9997)	(-0.1905)	(-0.8193)	(-0.6749)
LA Sharpe ratio	-0.002	0.008	0.018	0.01	0.02	0.01
	(-0.0488)	(0.1852)	(0.2776)	(0.2316)	(0.3084)	(0.1509)
LA information ratio	-0.007	-0.008	-0.019	-0.001	-0.012	-0.011
	(--0.1707)	(-0.1853)	(-0.2971)	(-0.0232)	(-0.1876)	(-0.1683)
LA Jensen alpha	0.032	0.072	0.008	0.04	-0.024	-0.064
	(0.2057)	(0.4363)	(0.0325)	(0.2424)	(-0.0976)	(-0.2539)
LA four-index alpha	-0.049	-0.083	-0.267	-0.034	-0.218	-0.184
	(-0.2912)	(-0.4651)	(-1.0068)	(-0.1905)	(-0.822)	(-0.677)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table C9. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

Table C13.

Summary of Regressions Using Morningstar Ratings as Predictor: Complete Funds

Country	Coefficient has correct negative sign	Nine/ Seven and a half years		Four years		One year	
		LA	Non LA	LA	Non LA	LA	Non LA
U.S.	Total (out of 16)	11 (4)	11 (4)	16 (12)	16 (12)	16 (15)	16 (15)
	4-star funds (out of 4)	4 (0)	4 (0)	4 (4)	4 (4)	4 (4)	4 (4)
	3-star funds (out of 4)	4 (4)	4 (4)	4 (4)	4 (4)	4 (4)	4 (4)
	2-star funds (out of 4)	1 (0)	1 (0)	4 (2)	4 (2)	4 (4)	4 (4)
	1-star funds (out of 4)	2 (0)	2 (0)	4 (2)	4 (2)	4 (3)	4 (3)
Canada	Total (out of 16)	5 (1)	5 (1)	14 (10)	13 (10)	16 (3)	16 (3)
	4-star funds (out of 4)	0 (0)	0 (0)	4 (1)	4 (1)	4 (0)	4 (0)
	3-star funds (out of 4)	0 (0)	0 (0)	3 (3)	3 (3)	4 (1)	4 (1)
	2-star funds (out of 4)	1 (0)	1 (0)	4 (3)	3 (3)	4 (1)	4 (1)
	1-star funds (out of 4)	4 (1)	4 (1)	3 (3)	3 (3)	4 (1)	4 (1)

Note. Significant cases are in parentheses. LA = Load-Adjusted

Table C14.

Summary of Tests of Difference in Coefficients: Complete Funds

Country	Difference of coefficient has correct negative sign	Nine/ Seven and a half years		Four years		One year	
		LA	Non LA	LA	Non LA	LA	Non LA
U.S.	Total (out of 24)	10 (0)	10 (0)	10 (0)	10 (0)	5 (0)	5 (0)
	4-star vs. 3-star funds (out of 4)	4 (0)	4 (0)	3 (0)	3 (0)	1 (0)	1 (0)
	4-star vs. 2-star funds (out of 4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	1 (0)
	4-star vs. 1-star funds (out of 4)	2 (0)	2 (0)	3 (0)	3 (0)	1 (0)	1 (0)
	3-star vs. 2-star funds (out of 4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	3-star vs. 1-star funds (out of 4)	0 (0)	0 (0)	1 (0)	1 (0)	1 (0)	1 (0)
	2-star vs. 1-star funds (out of 4)	4 (0)	4 (0)	3 (0)	3 (0)	1 (0)	1 (0)
Canada	Total (out of 24)	19 (3)	19 (3)	19 (1)	19 (1)	15 (0)	15 (0)
	4-star vs. 3-star funds out of 4)	1 (0)	1 (0)	3 (0)	3 (0)	3 (0)	3 (0)
	4-star vs. 2-star funds (out of 4)	3 (0)	3 (0)	3 (0)	3 (0)	2 (0)	2 (0)
	4-star vs. 1-star funds (out of 4)	4 (1)	4 (1)	3 (1)	3 (1)	2 (0)	2 (0)
	3-star vs. 2-star funds (out of 4)	3 (0)	3 (0)	4 (0)	4 (0)	2 (0)	2 (0)
	3-star vs. 1-star funds (out of 4)	4 (1)	4 (1)	3 (0)	3 (0)	3 (0)	3 (0)
	2-star vs. 1-star funds (out of 4)	4 (1)	4 (1)	3 (0)	3 (0)	3 (0)	3 (0)

Note. Significant cases are in parentheses. LA = Load-Adjusted

<div align="center">Appendix – D</div>

U.S. Periodic Funds:

Table D1.

Regression Analysis Using Morningstar Star as Predictor: Nine-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.107* (27.534)	-0.005 (-1.072)	-0.009* (-1.955)	0.000 (-0.072)	-0.006 (-0.764)	1.636	0.003
Non LA information ratio	0.039* (9.018)	-0.006 (-1.165)	-0.007** (-1.479)	0.004 (0.706)	0.001 (0.093)	2.131**	0.006
Non LA Jensen alpha	0.200* (8.131)	-0.024 (-0.796)	-0.037** (-1.307)	0.034 (1.067)	0.010 (0.200)	2.294**	0.007
Non LA four-index alpha	0.081* (3.517)	-0.013 (-0.472)	-0.042** (-1.572)	0.022 (0.749)	-0.029 (-0.644)	2.096**	0.006
LA Sharpe ratio	0.107* (27.532)	-0.005 (-1.072)	-0.009* (-1.956)	-0.000 (-0.073)	-0.006 (-0.764)	1.636	0.003
LA information ratio	0.039* (9.010)	-0.006 (-1.167)	-0.007** (-1.482)	0.004 (0.703)	0.001 (0.092)	2.132**	0.006
LA Jensen alpha	0.200* (8.131)	-0.024 (-0.798)	-0.037** (-1.291)	0.034 (1.064)	0.010 (0.199)	2.263**	0.007
LA four-index alpha	0.081* (3.517)	-0.013 (-0.473)	-0.042** (-1.553)	0.022 (0.748)	-0.029 (-0.645)	2.058**	0.005

Note. Sample size of 768 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2011. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D2.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.206* (27.189)	-0.019* (-2.108)	-0.029* (-3.261)	-0.018* (-1.827)	-0.026* (-1.737)	2.767*	0.009
Non LA information ratio	0.065* (7.828)	-0.020* (-1.942)	-0.020* (-2.077)	-0.002 (-0.180)	-0.002 (-0.092)	2.279**	0.007
Non LA Jensen alpha	0.325* (7.852)	-0.080** (-1.597)	-0.105* (-2.187)	-0.024 (-0.439)	-0.085 (-1.036)	1.736	0.004
Non LA four-index alpha	0.091* (2.975)	-0.063* (-1.705)	-0.096* (-2.704)	-0.052** (-1.332)	-0.107* (-1.786)	2.089**	0.006
LA Sharpe ratio	0.206* (27.186)	-0.019* (-2.109)	-0.029* (-3.262)	-0.018* (-1.827)	-0.026* (-1.738)	2.768*	0.009
LA information ratio	0.065* (7.816)	-0.020* (-1.945)	-0.020* (-2.081)	-0.002 (-0.184)	-0.002 (-0.093)	2.283**	0.007
LA Jensen alpha	0.325* (7.853)	-0.080** (-1.599)	-0.105* (-2.191)	-0.024 (-0.443)	-0.085 (-1.038)	1.738	0.004
LA four-index alpha	0.090* (2.974)	-0.063* (-1.706)	-0.096* (-2.706)	-0.053** (-1.334)	-0.107* (-1.788)	2.091**	0.006

Note. Sample size of 768 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2006. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D3:

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.354* (35.339)	-0.009 (-0.743)	-0.012 (-1.033)	-0.018** (-1.395)	-0.032* (-1.780)	0.994	0.000
Non LA information ratio	0.061* (6.063)	-0.008 (-0.644)	0.001 (0.114)	0.010 (0.779)	0.020 (1.098)	1.122	0.001
Non LA Jensen alpha	0.142* (3.701)	-0.021 (-0.444)	-0.042 (-0.958)	-0.047 (-0.957)	-0.055 (-0.796)	0.378	-0.003
Non LA four-index alpha	0.164* (6.418)	-0.037 (-1.194)	-0.046** (-1.548)	-0.041 (-1.232)	-0.034 (-0.745)	0.618	-0.002
LA Sharpe ratio	0.354* (35.338)	-0.009 (-0.774)	-0.012 (-1.035)	-0.018** (-1.398)	-0.032* (-1.782)	0.996	0.000
LA information ratio	0.061* (6.038)	-0.008 (-0.650)	0.001 (0.105)	0.010 (0.769)	0.020 (1.090)	1.115	0.001
LA Jensen alpha	0.142* (3.698)	-0.021 (-0.445)	-0.042 (-0.961)	-0.048 (-0.961)	-0.055 (-0.799)	0.381	-0.003
LA four-index alpha	0.164* (6.413)	-0.037 (-1.196)	-0.046** (-1.553)	-0.041 (-1.236)	-0.034 (-0.750)	0.621	-0.002

Note. Sample size of 853 included those funds that had an overall rating on July 1, 2003. Out-of-sample returns data used for the analysis is from July 2003 to June 2007. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D4.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.103* (10.364)	-0.018** (-1.540)	-0.025* (-2.236)	-0.027* (-2.187)	-0.031* (-1.849)	1.636	0.003
Non LA information ratio	0.068* (6.814)	-0.018** (-1.528)	-0.025* (-2.197)	-0.025* (-2.022)	-0.029* (-1.682)	1.446	0.002
Non LA Jensen alpha	0.266* (5.901)	-0.066 (-1.234)	-0.094* (-1.847)	-0.100* (-1.771)	-0.119** (-1.552)	1.123	0.001
Non LA four-index alpha	0.225* (7.516)	-0.072* (-2.036)	-0.091* (-2.683)	-0.072* (-1.908)	-0.043 (-0.855)	1.910	0.004
LA Sharpe ratio	0.103* (10.359)	-0.018** (-1.541)	-0.025* (-2.240)	-0.027* (-2.190)	-0.031* (-1.852)	1.642	0.003
LA information ratio	0.068* (6.807)	-0.018** (-1.529)	-0.025* (-2.202)	-0.025* (-2.027)	-0.029* (-1.686)	1.453	0.002
LA Jensen alpha	0.265* (5.897)	-0.066 (-1.235)	-0.094* (-1.851)	-0.100* (-1.775)	-0.119** (-1.554)	1.128	0.001
LA four-index alpha	0.224* (7.510)	-0.072* (-2.038)	-0.091* (-2.689)	-0.072* (-1.914)	-0.044 (-0.858)	1.917	0.004

Note. Sample size of 946 included those funds that had an overall rating on July 01, 2004. Out-of-sample returns data used for the analysis is from July 2004 to June 2008. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D5.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	-0.056* (-9.850)	-0.014* (-2.208)	-0.018* (-2.860)	-0.019* (-2.844)	-0.010 (-1.078)	2.464*	0.006
Non LA information ratio	0.041* (7.227)	-0.013* (-2.085)	-0.016* (-2.642)	-0.017* (-2.616)	-0.010 (-1.056)	2.059**	0.004
Non LA Jensen alpha	0.253* (7.185)	-0.052** (-1.289)	-0.074* (-1.891)	-0.086* (-2.070)	-0.051 (-0.860)	1.269	0.001
Non LA four-index alpha	0.153* (4.191)	-0.032 (-0.755)	-0.052** (-1.291)	-0.072* (-1.664)	-0.040 (-0.645)	0.876	0.000
LA Sharpe ratio	-0.056* (-9.854)	-0.014* (-2.209)	-0.018* (-2.863)	-0.019* (-2.848)	-0.010 (-1.081)	2.470*	0.006
LA information ratio	0.041* (7.232)	-0.013* (-2.083)	-0.016* (-2.639)	-0.017* (-2.611)	-0.010 (-1.052)	2.053**	0.004
LA Jensen alpha	0.253* (7.183)	-0.052** (-1.292)	-0.074* (-1.897)	-0.086* (-2.076)	-0.051 (-0.864)	1.277	0.001
LA four-index alpha	0.153* (4.187)	-0.032 (-0.757)	-0.052** (-1.296)	-0.072* (-1.668)	-0.040 (-0.648)	0.881	0.000

Note. Sample size of 1005 included those funds that had an overall rating on July 1, 2005. Out-of-sample returns data used for the analysis is from July 2005 to June 2009. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D6.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	-0.032* (-6.707)	-0.001 (-0.259)	-0.002 (-0.449)	-0.006 (-1.031)	0.017 (2.198)	2.927*	0.011
Non LA information ratio	0.024* (5.175)	-0.002 (-0.319)	-0.003 (-0.568)	-0.005 (-0.966)	0.015 (1.941)	2.410*	0.005
Non LA Jensen alpha	0.152* (5.037)	0.004 (0.114)	0.003 (0.091)	-0.021 (-0.590)	0.113 (2.323)	2.506*	0.006
Non LA four-index alpha	0.058* (2.006)	0.001 (0.025)	-0.018 (-0.554)	-0.025 (-0.746)	0.024 (0.521)	0.605	-0.001
LA Sharpe ratio	-0.032* (-6.710)	-0.001 (-0.260)	-0.002 (-0.451)	-0.006 (-1.035)	0.017 (2.196)	2.929*	0.007
LA information ratio	0.024* (5.177)	-0.002 (-0.318)	-0.003 (-0.567)	-0.005 (-0.964)	0.015 (1.943)	2.408*	0.005
LA Jensen alpha	0.152* (5.036)	0.004 (0.111)	0.003 (0.087)	-0.021 (-0.596)	0.112 (2.321)	2.512*	0.006
LA four-index alpha	0.058* (2.004)	0.001 (0.023)	-0.018 (-0.558)	-0.025 (-0.751)	0.024 (0.520)	0.609	-0.001

Note. Sample size of 1060 included those funds that had an overall rating on July 1, 2006. Out-of-sample returns data used for the analysis is from July 2006 to June 2010. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D7.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.030* (5.885)	-0.001 (-0.239)	-0.009** (-1.573)	-0.005 (-0.856)	-0.009 (-1.155)	1.320	0.001
Non LA information ratio	0.036* (7.166)	-0.002 (-0.268)	-0.009** (-1.579)	-0.005 (-0.852)	-0.009 (-1.151)	1.294	0.001
Non LA Jensen alpha	0.233* (6.854)	0.009 (0.232)	-0.042 (-1.115)	-0.018 (-0.449)	-0.057 (-1.093)	1.281	0.001
Non LA four-index alpha	0.044** (1.470)	-0.012 (-0.354)	-0.049** (-1.487)	-0.021 (-0.616)	-0.054 (-1.190)	1.150	0.001
LA Sharpe ratio	0.030* (5.884)	-0.001 (-0.239)	-0.009** (-1.573)	-0.005 (-0.857)	-0.009 (-1.155)	1.321	0.001
LA information ratio	0.036* (7.166)	-0.002 (-0.268)	-0.009** (-1.579)	-0.005 (-0.853)	-0.009 (-1.152)	1.294	0.001
LA Jensen alpha	0.233* (6.855)	0.009 (0.232)	-0.042 (-1.117)	-0.018 (-0.452)	-0.057 (-1.095)	1.283	0.001
LA four-index alpha	0.044** (1.469)	-0.012 (-0.353)	-0.049** (-1.487)	-0.021 (-0.617)	-0.054 (-1.190)	1.151	0.001

Note. Sample size of 1126 included those funds that had an overall rating on July 1, 2007. Out-of-sample returns data used for the analysis is from July 2007 to June 2011. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D8.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.055* (5.617)	-0.054* (-4.578)	-0.051* (-4.464)	-0.044* (-3.455)	-0.042* (-2.199)	5.977*	0.025
Non LA information ratio	0.044* (4.529)	-0.054* (-4.541)	-0.050* (-4.356)	-0.042* (-3.335)	-0.040* (-2.077)	5.803*	0.024
Non LA Jensen alpha	0.254* (4.123)	-0.273* (-3.670)	-0.246* (-3.435)	-0.187* (-2.350)	-0.114 (-0.943)	3.968*	0.015
Non LA four-index alpha	0.308* (4.894)	-0.309* (-4.051)	-0.324* (-4.424)	-0.316* (-3.881)	-0.350* (-2.817)	5.626*	0.024
LA Sharpe ratio	0.055* (5.613)	-0.054* (-4.579)	-0.051* (-4.465)	-0.044* (-3.457)	-0.042* (-2.200)	5.981*	0.025
LA information ratio	0.044* (4.524)	-0.054* (-4.542)	-0.050* (-4.359)	-0.042* (-3.337)	-0.040* (-2.078)	5.808*	0.024
LA Jensen alpha	0.254* (4.123)	-0.273* (-3.673)	-0.246* (-3.440)	-0.187* (-2.353)	-0.114 (-0.939)	3.979*	0.015
LA four-index alpha	0.308* (4.895)	-0.308* (-4.055)	-0.324* (-4.430)	-0.316* (-3.884)	-0.349* (-2.818)	5.637*	0.024

Note. Sample size of 768 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2003. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D9.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.644* (38.000)	-0.052* (-2.542)	-0.047* (2.385)	-0.046* (-2.101)	-0.102* (-3.361)	3.149*	0.010
Non LA information ratio	0.111* (5.969)	-0.048* (-2.137)	-0.018 (-0.830)	0.008 (0.313)	0.007 (0.221)	2.564*	0.007
Non LA Jensen alpha	0.431* (7.611)	-0.125* (-1.829)	-0.108* (-1.650)	-0.081 (-1.104)	-0.163** (-1.598)	1.076	0.000
Non LA four-index alpha	0.097* (1.764)	-0.058 (-0.874)	-0.068 (-1.072)	-0.114** (-1.604)	-0.130** (-1.311)	0.801	-0.001
LA Sharpe ratio	0.644* (37.999)	-0.052* (-2.542)	-0.047* (-2.386)	-0.046* (-2.102)	-0.103* (-3.362)	3.151*	0.010
LA information ratio	0.110* (5.910)	-0.048* (-2.147)	-0.018 (-0.851)	0.007 (0.290)	0.007 (0.203)	2.547*	0.007
LA Jensen alpha	0.430* (7.614)	-0.125* (-1.835)	-0.108* (-1.656)	-0.081 (-1.114)	-0.163** (-1.608)	1.084	0.000
LA four-index alpha	0.097* (1.761)	-0.058 (-0.874)	-0.068 (-1.070)	-0.114** (-1.606)	-0.130** (-1.317)	0.806	-0.001

Note. Sample size of 853 included those funds that had an overall rating on July 1, 2003. Out-of-sample returns data used for the analysis is from July 2003 to June 2004. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D10.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.259* (13.557)	-0.045* (-1.982)	-0.072* (-3.327)	-0.080* (-3.328)	-0.079* (-2.420)	3.796*	0.012
Non LA information ratio	0.149* (8.106)	-0.044* (-2.027)	-0.071* (-3.434)	-0.073* (-3.152)	-0.071* (-2.260)	3.657*	0.011
Non LA Jensen alpha	0.420* (6.016)	-0.145* (-1.755)	-0.255* (-3.232)	-0.297* (-3.384)	-0.421* (-3.552)	5.055*	0.017
Non LA four-index alpha	0.495* (6.667)	-0.152* (-1.734)	-0.199* (-2.381)	-0.141** (-1.515)	0.021 (0.168)	2.114**	0.005
LA Sharpe ratio	0.259* (13.554)	-0.045* (-1.984)	-0.072* (-3.331)	-0.080* (-3.331)	-0.079* (-2.423)	3.805*	0.012
LA information ratio	0.149* (8.092)	-0.044* (-2.030)	-0.072* (-3.445)	-0.073* (-3.161)	-0.071* (-2.269)	3.683*	0.011
LA Jensen alpha	0.419* (6.015)	-0.145* (-1.757)	-0.255* (-3.239)	-0.296* (-3.390)	-0.422* (-3.563)	5.083*	0.017
LA four-index alpha	0.493* (6.666)	-0.152* (-1.736)	-0.199* (-2.387)	-0.141** (-1.523)	0.021 (0.163)	2.120**	0.005

Note. Sample size of 946 included those funds that had an overall rating on July 1, 2004. Out-of-sample returns data used for the analysis is from July 2004 to June 2005. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D11.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.227* (15.021)	-0.013 (-0.760)	-0.015 (-0.920)	-0.022 (-1.256)	-0.046* (-1.797)	0.951	0.000
Non LA information ratio	0.102* (6.323)	-0.018 (-0.970)	-0.020 (-1.127)	-0.027** (-1.398)	-0.038** (-1.410)	0.680	-0.001
Non LA Jensen alpha	0.246* (4.449)	-0.028 (-0.449)	-0.071 (-1.166)	-0.078 (-1.192)	-0.167* (-1.789)	1.176	0.001
Non LA four-index alpha	0.054 (1.090)	0.003 (0.060)	0.020 (0.371)	0.014 (0.242)	-0.121** (-1.440)	0.998	0.000
LA Sharpe ratio	0.226* (15.010)	-0.013 (-0.765)	-0.016 (-0.930)	-0.023 (-1.270)	-0.046* (-1.808)	0.964	0.000
LA information ratio	0.102* (6.294)	-0.018 (-0.979)	-0.020 (-1.145)	-0.027** (-1.423)	-0.039** (-1.429)	0.704	-0.001
LA Jensen alpha	0.245* (4.439)	-0.029 (-0.453)	-0.072 (-1.176)	-0.078 (-1.204)	-0.167* (-1.799)	1.191	0.001
LA four-index alpha	0.054 (1.078)	0.003 (0.057)	0.020 (0.363)	0.014 (0.232)	-0.121** (-1.450)	1.001	0.000

Note. Sample size of 1005 included those funds that had an overall rating on July 1, 2005. Out-of-sample returns data used for the analysis is from July 2005 to June 2006. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D12.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.508* (24.326)	-0.004 (-0.164)	-0.026 (-1.107)	-0.022 (-0.900)	-0.095* (-2.812)	2.696*	0.006
Non LA information ratio	-0.017 (-0.974)	-0.010 (-0.487)	-0.018 (-0.931)	-0.021 (-1.061)	-0.039** (-1.406)	0.658	-0.001
Non LA Jensen alpha	0.155* (3.173)	-0.074** (-1.300)	-0.130* (-2.408)	-0.144* (-2.531)	-0.191* (-2.433)	2.582*	0.006
Non LA four-index alpha	0.316* (5.240)	-0.136* (-1.921)	-0.194* (-2.901)	-0.207* (-2.933)	-0.264* (-2.717)	3.009*	0.008
LA Sharpe ratio	0.508* (24.322)	-0.004 (-0.171)	-0.026 (-1.116)	-0.022 (-0.918)	-0.095* (-2.820)	2.707*	0.006
LA information ratio	-0.018 (-1.041)	-0.010 (-0.520)	-0.018 (-0.970)	-0.023 (-1.141)	-0.040** (-1.438)	0.706	-0.001
LA Jensen alpha	0.154* (3.166)	-0.075** (-1.312)	-0.131* (-2.423)	-0.145* (-2.554)	-0.191* (-2.440)	2.610*	0.006
LA four-index alpha	0.315* (5.237)	-0.136* (-1.933)	-0.195* (-2.915)	-0.208* (-2.955)	-0.264* (-2.722)	3.037*	0.008

Note. Sample size of 1060 included those funds that had an overall rating on July 1, 2006. Out-of-sample returns data used for the analysis is from July 2006 to June 2007. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D13.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	-0.210* (-9.522)	-0.016 (-0.619)	-0.078* (-3.214)	-0.073* (-2.854)	-0.140* (-4.130)	7.965*	0.024
Non LA information ratio	0.105* (4.999)	-0.023 (-0.920)	-0.075* (-3.240)	-0.067* (-2.751)	-0.116* (-3.593)	6.094*	0.018
Non LA Jensen alpha	0.571* (5.192)	-0.047 (-0.363)	-0.321* (-2.655)	-0.331* (-2.608)	-0.681* (-4.037)	7.299*	0.022
Non LA four-index alpha	0.133* (1.816)	0.141 (1.638)	0.069 (0.861)	0.121 (1.433)	0.052 (0.461)	0.980	0.000
LA Sharpe ratio	-0.210* (-9.527)	-0.016 (-0.620)	-0.078* (-3.216)	-0.073* (-2.858)	-0.140* (-4.134)	7.978*	0.024
LA information ratio	0.105* (5.020)	-0.023 (-0.917)	-0.075* (-3.230)	-0.066* (-2.732)	-0.115* (-3.577)	6.044*	0.018
LA Jensen alpha	0.569* (5.189)	-0.047 (-0.364)	-0.321* (-2.660)	-0.331* (-2.616)	-0.680* (-4.042)	7.324*	0.022
LA four-index alpha	0.132* (1.806)	0.141 (1.641)	0.069 (0.859)	0.121 (1.428)	0.051 (0.458)	0.982	0.000

Note. Sample size of 1126 included those funds that had an overall rating on July 01, 2007. Out-of-sample returns data used for the analysis is from July 2007 to June 2008. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D14.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	-0.278* (-26.011)	0.028 (2.238)	0.036 (3.052)	0.041 (3.289)	0.073 (4.612)	5.856*	0.016
Non LA information ratio	-0.010 (-0.978)	0.024 (2.040)	0.025 (2.241)	0.029 (2.444)	0.058 (3.843)	3.779*	0.009
Non LA Jensen alpha	-0.037 (-0.364)	0.296 (2.512)	0.369 (3.319)	0.455 (3.885)	0.800 (5.343)	8.030*	0.023
Non LA four-index alpha	-1.112* (-7.697)	0.108 (0.641)	0.284 (1.789)	0.273 (1.634)	0.296 (1.386)	1.398	0.001
LA Sharpe ratio	-0.278* (-26.011)	0.028 (2.238)	0.036 (3.052)	0.041 (3.289)	0.073 (4.611)	5.855*	0.016
LA information ratio	-0.010 (-0.924)	0.024 (2.039)	0.025 (2.246)	0.029 (2.464)	0.059 (3.854)	3.810*	0.009
LA Jensen alpha	-0.037 (-0.365)	0.296 (2.514)	0.369 (3.318)	0.453 (3.883)	0.798 (5.341)	8.019*	0.023
LA four-index alpha	-1.110* (-7.703)	0.108 (0.643)	0.284 (1.794)	0.273 (1.640)	0.296 (1.389)	1.407	0.001

Note. Sample size of 1194 included those funds that had an overall rating on July 01, 2008. Out-of-sample returns data used for the analysis is from July 2008 to June 2009. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D15.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.297* (27.124)	-0.015 (-1.250)	-0.022* (-1.863)	-0.022* (-1.751)	-0.010 (-0.651)	1.156	0.000
Non LA information ratio	0.032* (2.617)	0.007 (0.501)	0.010 (0.736)	0.011 (0.776)	0.040 (2.321)	1.739	0.002
Non LA Jensen alpha	0.246* (3.867)	-0.024 (-0.340)	-0.051 (-0.732)	-0.037 (-0.513)	0.028 (0.314)	0.425	-0.002
Non LA four-index alpha	0.056 (0.976)	-0.014 (-0.221)	-0.072 (-1.147)	-0.055 (-0.844)	-0.076 (-0.938)	0.787	-0.001
LA Sharpe ratio	0.297* (27.124)	-0.015 (-1.250)	-0.022* (-1.863)	-0.022* (-1.752)	-0.010 (-0.651)	1.156	0.000
LA information ratio	0.031* (2.583)	0.007 (0.486)	0.010 (0.721)	0.010 (0.749)	0.039 (2.301)	1.717	0.002
LA Jensen alpha	0.246* (3.872)	-0.024 (-0.342)	-0.051 (-0.736)	-0.037 (-0.517)	0.027 (0.307)	0.424	-0.002
LA four-index alpha	0.056 (0.979)	-0.014 (-0.222)	-0.072 (-1.149)	-0.055 (-0.845)	-0.077 (-0.943)	0.791	-0.001

Note. Sample size of 1266 included those funds that had an overall rating on July 1, 2009. Out-of-sample returns data used for the analysis is from July 2009 to June 2010. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

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Table D16.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
Non LA Sharpe ratio	0.588* (45.466)	0.026 (1.726)	0.018 (1.298)	0.006 (0.436)	-0.023 (-1.222)	3.359*	0.007
Non LA information ratio	-0.069* (-4.911)	0.104 (6.506)	0.121 (7.990)	0.121 (7.773)	0.121 (6.079)	17.307*	0.047
Non LA Jensen alpha	0.113* (1.842)	0.075 (1.074)	0.037 (0.560)	-0.002 (-0.034)	-0.147* (-1.671)	2.720*	0.005
Non LA four-index alpha	0.069 (1.182)	0.029 (0.443)	0.002 (0.031)	-0.021 (-0.321)	-0.202* (-2.442)	3.125*	0.006
LA Sharpe ratio	0.588* (45.466)	0.026 (1.726)	0.018 (1.298)	0.006 (0.436)	-0.023 (-1.222)	3.359*	0.007
LA information ratio	-0.069* (-4.962)	0.103 (6.464)	0.121 (7.943)	0.120 (7.702)	0.120 (6.031)	17.050*	0.046
LA Jensen alpha	0.113* (1.846)	0.075 (1.070)	0.037 (0.553)	-0.003 (-0.041)	-0.147* (-1.677)	2.723*	0.005
LA four-index alpha	0.069 (1.185)	0.029 (0.441)	0.002 (0.026)	-0.021 (-0.325)	-0.202* (-2.445)	3.126*	0.006

Note. Sample size of 1323 included those funds that had an overall rating on July 1, 2010. Out-of-sample returns data used for the analysis is from July 2010 to June 2011. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D17.

Tests of Differences in Coefficients: Nine-Year: July 2002

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.004 (-0.5657)	0.005 (0.7071)	-0.001 (-0.106)	0.009 (1.2728)	0.003 (0.318)	-0.006 (-0.636)
Non LA information ratio	-0.001 (-0.1414)	0.01 (1.2804)	0.007 (0.742)	0.011 (1.4084)	0.008 (0.848)	-0.003 (-0.3)
Non LA Jensen alpha	-0.013 (-0.3116)	0.058 (1.3223)	0.034 (0.5918)	0.071 (1.6441)	0.047 (0.8255)	-0.024 (-0.4101)
Non LA four-index alpha	-0.029 (-0.7456)	0.035 (0.8529)	-0.016 (-0.2971)	0.064 (1.5857)	0.013 (0.2437)	-0.051 (-0.9287)
LA Sharpe ratio	-0.004 (-0.5657)	0.005 (0.7071)	-0.001 (-0.106)	0.009 (1.2728)	0.003 (0.318)	-0.006 (-0.636)
LA information ratio	-0.001 (-0.1414)	0.01 (1.2803)	0.007 (0.742)	0.011 (1.4084)	0.008 (0.848)	-0.003 (-0.3)
LA Jensen alpha	-0.013 (-0.3116)	0.058 (1.3223)	0.034 (0.5918)	0.071 (1.6441)	0.047 (0.8255)	-0.024 (-0.4101)
LA four-index alpha	-0.029 (-0.7456)	0.035 (0.8529)	-0.016 (-0.2971)	0.064 (1.5857)	0.013 (0.2437)	-0.051 (-0.9287)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D1. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D18.

Tests of Differences in Coefficients: Four-Year: July 2002

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.01 (-0.7857)	0.001 (0.0743)	-0.007 (-0.4002)	0.011 (0.8176)	0.003 (0.1715)	-0.008 (-0.4438)
Non LA information ratio	0 (0)	0.018 (1.2108)	0.018 (0.954)	0.018 (1.2108)	0.018 (0.954)	0 (0)
Non LA Jensen alpha	-0.025 (-0.3607)	0.056 (0.7609)	-0.005 (-0.0521)	0.081 (1.1211)	0.02 (0.2105)	-0.061 (-0.6213)
Non LA four-index alpha	-0.033 (-0.6479)	0.011 (0.2046)	-0.044 (-0.6242)	0.044 (0.8397)	-0.011 (-0.1584)	-0.055 (-0.7686)
LA Sharpe ratio	-0.01 (-0.7857)	0.001 (0.0743)	-0.007 (-0.4002)	0.011 (0.8176)	0.003 (0.1715)	-0.008 (-0.4438)
LA information ratio	0 (0)	0.018 (1.2108)	0.018 (0.954)	0.018 (1.2108)	0.018 (0.954)	0 (0)
LA Jensen alpha	-0.025 (-0.3607)	0.056 (0.7609)	-0.005 (-0.0521)	0.081 (1.1211)	0.02 (0.2105)	-0.061 (-0.6213)
LA four-index alpha	-0.033 (-0.6479)	0.01 (0.186)	-0.044 (-0.6242)	0.043 (0.8206)	-0.011 (-0.1584)	-0.054 (-0.7546)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D2. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D19.

Tests of Differences in Coefficients: Four-Year: July 2003

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.003	-0.009	-0.023	-0.006	-0.02	-0.014
	(-0.1768)	(-0.5087)	(-1.0632)	(-0.3391)	(-0.9245)	(-0.6305)
Non LA information ratio	0.009	0.018	0.028	0.009	0.019	0.01
	(0.5303)	(1.0174)	(1.2943)	(0.5087)	(0.8783)	(0.4504)
Non LA Jensen alpha	-0.021	-0.026	-0.034	-0.005	-0.013	-0.008
	(-0.3299)	(-0.3827)	(-0.41)	(-0.0751)	(-0.1589)	(-0.0939)
Non LA four-index alpha	-0.009	-0.004	0.003	0.005	0.012	0.007
	(-0.2086)	(-0.0884)	(0.0541)	(0.1121)	(0.2185)	(0.1237)
LA Sharpe ratio	-0.003	-0.009	-0.023	-0.006	-0.02	-0.014
	(-0.1768)	(-0.5087)	(-1.0632)	(-0.3391)	(-0.9245)	(-0.6305)
LA information ratio	0.009	0.018	0.028	0.009	0.019	0.01
	(0.5303)	(1.0174)	(1.2943)	(0.5087)	(0.01)	(0.4504)
LA Jensen alpha	-0.021	-0.027	-0.034	-0.006	-0.013	-0.007
	(-0.3299)	(-0.3974)	(-0.41)	(-0.0901)	(-0.1589)	(-0.0821)
LA four-index alpha	-0.009	-0.004	0.003	0.005	0.012	0.007
	(-0.2086)	(-0.0884)	(0.0541)	(0.1121)	(0.2185)	(0.1237)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D3. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D20.

Tests of Differences in Coefficients: Four-Year: July 2004

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.007	-0.009	-0.013	-0.002	-0.006	-0.004
	(-0.43)	(-0.5303)	(-0.6247)	(-0.1229)	(-0.2963)	(-0.1922)
Non LA information ratio	-0.007	-0.007	-0.011	0	-0.004	-0.004
	(-0.43)	(-0.3957)	(-0.5286)	(0)	(-0.1975)	(-0.1869)
Non LA Jensen alpha	-0.028	-0.034	-0.053	-0.006	-0.025	-0.019
	(-0.3807)	(-0.4409)	(-0.572)	(-0.0792)	(-0.2731)	(-0.2013)
Non LA four-index alpha	-0.019	0	0.029	0.019	0.048	0.029
	(-0.3894)	(0)	(0.4688)	(0.3726)	(0.7831)	(0.4559)
LA Sharpe ratio	-0.007	-0.009	-0.013	-0.002	-0.006	-0.004
	(-0.43)	(-0.5303)	(-0.6247)	(-0.1229)	(-0.2963)	(-0.1922)
LA information ratio	-0.007	-0.007	-0.011	0	-0.004	-0.004
	(-0.43)	(-0.3957)	(-0.5286)	(0)	(-0.1975)	(-0.1869)
LA Jensen alpha	-0.028	-0.034	-0.053	-0.006	-0.025	-0.019
	(-0.3807)	(-0.4409)	(-0.572)	(-0.0792)	(-0.2731)	(-0.2013)
LA four-index alpha	-0.019	0	0.028	0.019	0.047	0.028
	(-0.3894)	(0)	(0.4527)	(0.3726)	(0.7668)	(0.4403)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D4. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D21.

Tests of Differences in Coefficients: Four-Year: July 2005

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.004 (-0.4339)	-0.005 (-0.5051)	0.004 (0.3277)	-0.001 (-0.1085)	0.008 (0.6859)	0.009 (0.7373)
Non LA information ratio	-0.003 (-0.3536)	-0.004 (-0.4339)	0.003 (0.2774)	-0.001 (-0.1085)	0.006 (0.5547)	0.007 (0.6139)
Non LA Jensen alpha	-0.022 (-0.3938)	-0.034 (-0.5936)	0.001 (0.0140)	-0.012 (-0.2121)	0.023 (0.3252)	0.035 (0.4872)
Non LA four-index alpha	-0.02 (-0.3448)	-0.04 (-0.6655)	-0.008 (-0.1068)	-0.02 (-0.3406)	0.012 (0.1626)	0.032 (0.4241)
LA Sharpe ratio	-0.004 (-0.4339)	-0.005 (0.5051)	0.004 (0.3277)	-0.001 (-0.1085)	0.008 (0.6859)	0.009 (0.7373)
LA information ratio	-0.003 (-0.3536)	-0.004 (-0.4339)	0.003 (0.2774)	-0.001 (-0.1085)	0.006 (0.5547)	0.007 (0.6139)
LA Jensen alpha	-0.022 (-0.3938)	-0.034 (-0.5936)	0.001 (0.0140)	-0.012 (-0.2121)	0.023 (0.3252)	0.035 (0.4872)
LA four-index alpha	-0.02 (-0.3448)	-0.04 (-0.6655)	-0.008 (-0.1068)	-0.02 (-0.3406)	0.012 (0.1626)	0.032 (0.4241)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D5. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D22.

Tests of Differences in Coefficients: Four-Year: July 2006

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.001 (-0.128)	-0.005 (-0.5893)	0.018 (1.8)	-0.004 (-0.5121)	0.019 (2.014)	0.023 (2.3)
Non LA information ratio	-0.001 (-0.1414)	-0.003 (-0.4243)	0.017 (1.802)	-0.002 (-0.2828)	0.018 (1.908)	0.02 (2.12)
Non LA Jensen alpha	-0.001 (-0.0208)	-0.025 (-0.5051)	0.109 (1.8348)	-0.024 (-0.4989)	0.11 (1.8884)	0.134 (2.2557)
Non LA four-index alpha	-0.019 (-0.4069)	-0.026 (-0.5407)	0.023 (0.4021)	-0.007 (-0.1499)	0.042 (0.7495)	0.049 (0.8566)
LA Sharpe ratio	-0.001 (-0.128)	-0.005 (-0.5893)	0.018 (1.8)	-0.004 (-0.5121)	0.019 (2.014)	0.023 (2.3)
LA information ratio	-0.001 (-0.1414)	-0.003 (-0.4243)	0.017 (1.802)	-0.002 (-0.2828)	0.018 (1.908)	0.02 (2.12)
LA Jensen alpha	-0.001 (-0.0208)	-0.025 (-0.5051)	0.108 (1.8180)	-0.024 (-0.4989)	0.109 (1.8713)	0.133 (2.2389)
LA four-index alpha	-0.019 (-0.4069)	-0.026 (-0.5407)	0.023 (0.4021)	-0.007 (-0.1499)	0.042 (0.7495)	0.049 (0.8566)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D6. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D23.

Tests of Differences in Coefficients: Four-Year: July 2007

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.008	-0.004	-0.008	0.004	0	-0.004
	(-0.9428)	(-0.4714)	(-0.8)	(0.4714)	(0)	(-0.4)
Non LA information ratio	-0.007	-0.003	-0.007	0.004	0	-0.004
	(-0.825)	(-0.3536)	(-0.7)	(0.4714)	(0)	(-0.4)
Non LA Jensen alpha	-0.051	-0.027	-0.066	0.024	-0.015	-0.039
	(-0.936)	(-0.4833)	(-1.006)	(0.4464)	(-0.235)	(-0.6)
Non LA four-index alpha	-0.037	-0.009	-0.042	0.028	-0.005	-0.033
	(-0.7692)	(-0.1844)	(-0.7266)	(0.5909)	(-0.0883)	(-0.5769)
LA Sharpe ratio	-0.008	-0.004	-0.008	0.004	0	-0.004
	(-0.9428)	(-0.4714)	(-0.8)	(0.4714)	(0)	(-0.4)
LA information ratio	-0.007	-0.003	-0.007	0.004	0	-0.004
	(-0.825)	(-0.3536)	(-0.7)	(0.4714)	(0)	(-0.4)
LA Jensen alpha	-0.051	-0.027	-0.066	0.024	-0.015	-0.039
	(-0.936)	(-0.4833)	(-1.006)	(0.4464)	(-0.235)	(-0.6)
LA four-index alpha	-0.037	-0.009	-0.042	0.028	-0.005	-0.033
	(-0.7692)	(-0.1844)	(-0.7266)	(0.5909)	(-0.0883)	(-0.5769)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D7. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D24.

Tests of Differences in Coefficients: One-Year: July 2002

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.003	0.01	0.012	0.007	0.009	0.002
	(0.1843)	(0.5652)	(0.5339)	(0.4111)	(0.4099)	(0.0869)
Non LA information ratio	0.004	0.012	0.014	0.008	0.01	0.002
	(0.2457)	(0.6782)	(0.6229)	(0.4698)	(0.4555)	(0.0869)
Non LA Jensen alpha	0.027	0.086	0.159	0.059	0.132	0.073
	(0.2615)	(0.7892)	(1.1210)	(0.5482)	(0.9375)	(0.5033)
Non LA four-index alpha	-0.015	-0.007	-0.041	0.008	-0.026	-0.034
	(-0.1423)	(-0.0626)	(-0.2819)	(0.0729)	(-0.1807)	(-0.2287)
LA Sharpe ratio	0.003	0.01	0.012	0.007	0.009	0.002
	(0.1843)	(0.5652)	(0.5339)	(0.4111)	(0.4099)	(0.0869)
LA information ratio	0.004	0.012	0.014	0.008	0.01	0.002
	(0.2457)	(0.6783)	(0.6229)	(0.4698)	(0.4555)	(0.0869)
LA Jensen alpha	0.027	0.086	0.159	0.059	0.132	0.073
	(0.2633)	(0.7892)	(1.1210)	(0.5516)	(0.9409)	(0.5033)
LA four-index alpha	-0.016	-0.008	-0.041	0.008	-0.025	-0.033
	(-0.1518)	(-0.0720)	(-0.2819)	(0.0734)	(-0.1737)	(-0.2228)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D8. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D25.

Tests of Differences in Coefficients: One-Year: July 2003

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.005 (0.1768)	0.006 (0.2018)	-0.05** (-1.3868)	0.001 (0.0336)	-0.055** (-1.5254)	-0.056** (-1.5053)
Non LA information ratio	0.03 (0.9864)	0.056 (1.72)	0.055 (1.3868)	0.026 (0.8153)	0.025 (0.6391)	-0.001 (-0.0245)
Non LA Jensen alpha	0.017 (0.1807)	0.044 (0.4410)	-0.038 (-0.31)	0.027 (0.2762)	-0.055 (-0.4547)	-0.082 (-0.6537)
Non LA four-index alpha	-0.01 (-0.1079)	-0.056 (-0.5736)	-0.072 (-0.6023)	-0.046 (-0.4812)	-0.062 (-0.5259)	-0.016 (-0.1313)
LA Sharpe ratio	0.005 (0.1768)	0.006 (0.2018)	-0.051** (-1.4145)	0.001 (0.0336)	-0.056** (-1.5532)	-0.057** (-1.5322)
LA information ratio	0.03 (0.9864)	0.055 (1.6893)	0.055 (1.3868)	0.025 (0.7839)	0.025 (0.6391)	0 (0)
LA Jensen alpha	0.017 (0.1807)	0.044 (0.4410)	-0.038 (-0.31)	0.027 (0.2762)	-0.055 (-0.4547)	-0.082 (-0.6537)
LA four-index alpha	-0.01 (-0.1088)	-0.056 (-0.5777)	-0.072 (-0.6051)	-0.046 (-0.4812)	-0.062 (-0.5259)	-0.016 (-0.1313)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D9. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D26.

Tests of Differences in Coefficients: One-Year: July 2004

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.027 (-0.8483)	-0.035 (-1.0529)	-0.034 (-0.8453)	-0.008 (-0.2457)	-0.007 (-0.1765)	0.001 (0.0245)
Non LA information ratio	-0.027 (-0.8878)	-0.029 (-0.9112)	-0.027 (-0.7103)	-0.002 (-0.0642)	0 (0)	0.002 (0.0518)
Non LA Jensen alpha	-0.11 (-0.9661)	-0.152 (-1.2637)	-0.276* (-1.9098)	-0.042 (-0.3552)	-0.166 (-1.1622)	-0.124 (-0.8378)
Non LA four-index alpha	-0.047 (-0.3863)	0.011 (0.0859)	0.173 (1.1257)	0.058 (0.4628)	0.22 (1.4528)	0.162 (1.0345)
LA Sharpe ratio	-0.027 (-0.8483)	-0.035 (-1.0529)	-0.034 (-0.8453)	-0.008 (-0.2457)	-0.007 (-0.1765)	0.001 (0.0245)
LA information ratio	-0.028 (-0.9206)	-0.029 (-0.9112)	-0.027 (0.7103)	-0.001 (-0.0321)	0.001 (0.0267)	0.002 (0.0518)
LA Jensen alpha	-0.11 (-0.9661)	-0.151 (-1.2630)	-0.277* (-1.9277)	-0.041 (-0.3489)	-0.167 (-1.176)	-0.126 (-0.8595)
LA four-index alpha	-0.047 (-0.3909)	0.011 (0.0864)	0.173 (1.1299)	0.058 (0.4653)	0.22 (1.4581)	0.162 (1.0345)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D10. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D27.

Tests of Differences in Coefficients: One-Year: July 2005

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.002	-0.009	-0.033	-0.007	-0.031	-0.024
	(-0.0832)	(-0.3635)	(-1.0915)	(-0.2827)	(-1.0254)	(-0.7791)
Non LA information ratio	-0.002	-0.009	-0.02	-0.007	-0.018	-0.011
	(-0.0786)	(-0.3439)	(-0.6163)	(-0.2675)	(-0.5547)	(-0.3332)
Non LA Jensen alpha	-0.043	-0.05	-0.139	-0.007	-0.096	-0.089
	(-0.4903)	(-0.5524)	(-1.2374)	(-0.0785)	(-0.8632)	(-0.7844)
Non LA four-index alpha	0.017	0.011	-0.124	-0.006	-0.141**	-0.135**
	(0.2146)	(0.1341)	(-1.2215)	(-0.0744)	(-1.4043)	(-1.3151)
LA Sharpe ratio	-0.003	-0.01	-0.033	-0.007	-0.03	-0.023
	(-0.1248)	(-0.4039)	(-1.0915)	(-0.2827)	(-0.9923)	(-0.7466)
LA information ratio	-0.002	-0.009	-0.021	-0.007	-0.019	-0.012
	(-0.0786)	(-0.3439)	(-0.6472)	(-0.2675)	(-0.5855)	(-0.3635)
LA Jensen alpha	-0.043	-0.049	-0.138	-0.006	-0.095	-0.089
	(-0.4903)	(-0.5413)	(-1.2285)	(-0.0673)	(-0.8542)	(-0.7844)
LA four-index alpha	0.017	0.011	-0.124	-0.006	-0.141**	-0.135**
	(0.2146)	(0.1353)	(-1.2215)	(-0.0751)	(-1.4043)	(-1.3225)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D11. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D28.

Tests of Differences in Coefficients: One-Year: July 2006

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.022	-0.018	-0.091*	0.004	-0.069*	-0.073*
	(-0.6618)	(-0.5303)	(-2.1866)	(0.1203)	(-1.6809)	(-1.7541)
Non LA information ratio	-0.008	-0.011	-0.029	-0.003	-0.021	-0.018
	(-0.29)	(-0.3889)	(-0.8428)	(-0.1087)	(-0.6206)	(-0.5231)
Non LA Jensen alpha	-0.056	-0.07	-0.117	-0.014	-0.061	-0.047
	(-0.7132)	(-0.8684)	(-1.2111)	(-0.1783)	(-0.643)	(-0.4865)
Non LA four-index alpha	-0.058	-0.071	-0.128	-0.013	-0.07	-0.057
	(-0.5941)	(-0.7121)	(-1.0648)	(-0.1342)	(-0.5938)	(-0.4765)
LA Sharpe ratio	-0.022	-0.018	-0.091*	0.004	-0.069*	-0.073*
	(-0.6618)	(-0.5303)	(-2.1866)	(0.1203)	(-1.6809)	(-1.7541)
LA information ratio	-0.008	-0.013	-0.03	-0.005	-0.022	-0.017
	(-0.29)	(-0.4596)	(-0.8719)	(-0.1812)	(-0.6502)	(-0.4941)
LA Jensen alpha	-0.056	-0.07	-0.116	-0.014	-0.06	-0.046
	(-0.7132)	(-0.8684)	(-1.2007)	(-0.1783)	(-0.6325)	(-0.4762)
LA four-index alpha	-0.059	-0.072	-0.128	-0.013	-0.069	-0.056
	(--0.6089)	(-0.7273)	(-1.0701)	(-0.1342)	(-0.5853)	(-0.4681)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D12. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D29.

Tests of Differences in Coefficients: One-Year: July 2007

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.062*	-0.057**	-0.124*	0.005	-0.062**	-0.067**
	(-1.7522)	(-1.5803)	(-2.8971)	(0.1443)	(-1.4898)	(-1.5876)
Non LA information ratio	-0.052**	-0.044	-0.093*	0.008	-0.041	-0.049
	(-1.5307)	(-1.2696)	(-2.2902)	(0.2407)	(-1.0404)	(-1.225)
Non LA Jensen alpha	-0.274	-0.284**	-0.634*	-0.01	-0.36*	-0.35*
	(1.5492)	(-1.5689)	(-2.982)	(-0.057)	(-1.732)	(-1.6556)
Non LA four-index alpha	-0.072	-0.02	-0.089	0.052	-0.017	-0.069
	(-0.6094)	(-0.1654)	(-0.6267)	(0.4429)	(-0.1223)	(-0.488)
LA Sharpe ratio	-0.062*	-0.057**	-0.124*	0.005	-0.062**	-0.067**
	(-1.7522)	(-1.5803)	(-2.8971)	(0.1443)	(-1.4898)	(-1.5876)
LA information ratio	-0.052**	-0.043	-0.092*	0.009	-0.04	-0.049
	(-1.5307)	(-1.2408)	(-2.2656)	(0.2707)	(-1.015)	(-1.225)
LA Jensen alpha	-0.274	-0.284**	-0.633*	-0.01	-0.359*	-0.349*
	(-1.5492)	(-1.5689)	(-2.9885)	(-0.057)	(-1.734)	(-1.6572)
LA four-index alpha	-0.072	-0.02	-0.09	0.052	-0.018	-0.07
	(-0.613)	(-0.1654)	(-0.6374)	(0.4455)	(-0.1308)	(-0.4979)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D13. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D30.

Tests of Differences in Coefficients: One-Year: July 2008

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.008	0.013	0.045	0.005	0.037	0.032
	(0.4714)	(0.7660)	(2.25)	(0.2946)	(1.85)	(1.6)
Non LA information ratio	0.001	0.005	0.034	0.004	0.033	0.029
	(0.0614)	(0.2946)	(1.7699)	(0.2457)	(1.7741)	(1.5097)
Non LA Jensen alpha	0.073	0.159	0.504	0.086	0.431	0.345
	(0.4506)	(0.9568)	(2.6408)	(0.5332)	(2.3097)	(1.8136)
Non LA four-index alpha	0.176	0.165	0.188	-0.011	0.012	0.023
	(0.7609)	(0.6965)	(0.6930)	(-0.0477)	(0.0452)	(0.0849)
LA Sharpe ratio	0.008	0.013	0.045	0.005	0.037	0.032
	(0.4714)	(0.7660)	(2.25)	(0.2946)	(1.85)	(1.6)
LA information ratio	0.001	0.005	0.035	0.004	0.034	0.03
	(0.0614)	(0.2946)	(1.8220)	(0.2457)	(1.8279)	(1.5617)
LA Jensen alpha	0.073	0.157	0.502	0.084	0.429	0.345
	(0.4506)	(0.9448)	(2.6412)	(0.5208)	(2.3089)	(1.8211)
LA four-index alpha	0.176	0.165	0.188	-0.011	0.012	0.023
	(0.7631)	(0.6966)	(0.6930)	(-0.0478)	(0.0453)	(0.0849)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D14. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D31.

Tests of Differences in Coefficients: One-Year: July 2009

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.007	-0.007	0.005	0	0.012	0.012
	(-0.4125)	(-0.4125)	(0.2603)	(0)	(0.6247)	(0.6247)
Non LA information ratio	0.003	0.004	0.033	0.001	0.03	0.029
	(0.1570)	(0.2020)	(1.4985)	(0.0523)	(1.4018)	(1.3168)
Non LA Jensen alpha	-0.027	-0.013	0.052	0.014	0.079	0.065
	(-0.2707)	(-0.1286)	(0.4512)	(0.1414)	(0.6966)	(0.5670)
Non LA four-index alpha	-0.058	-0.041	-0.062	0.017	-0.004	-0.021
	(-0.6407)	(-0.4460)	(-0.5925)	(0.1878)	(-0.0387)	(-0.2007)
LA Sharpe ratio	-0.007	-0.007	0.005	0	0.012	0.012
	(-0.4125)	(-0.4125)	(0.2603)	(0)	(0.6247)	(0.6247)
LA information ratio	0.003	0.003	0.032	0	0.029	0.029
	(0.1570)	(-0.1515)	(1.4531)	(0)	(1.3551)	(1.3168)
LA Jensen alpha	-0.027	-0.013	0.051	0.014	0.078	0.064
	(-0.2707)	(-0.1286)	(0.4455)	(0.1414)	(0.6926)	(0.5621
LA four-index alpha	-0.058	-0.041	-0.063	0.017	-0.005	-0.022
	(-0.6407)	(-0.4460)	(-0.6066)	(0.1878)	(-0.0487)	(-0.2118)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D15. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D32.

Tests of Differences in Coefficients: One-Year: July 2010

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.008	-0.02	-0.049*	-0.012	-0.041*	-0.029
	(-0.3899)	(-0.9747)	(-2.0913)	(-0.6061)	(-1.798)	(-1.2717)
Non LA information ratio	0.017	0.017	0.017	0	0	0
	(0.7751)	(0.7513)	(0.6637)	(0)	(0)	(0)
Non LA Jensen alpha	-0.038	-0.077	-0.222*	-0.039	-0.184*	-0.145**
	(-0.3922)	(-0.7890)	(-1.9743)	(-0.4085)	(-1.6636)	(-1.3038)
Non LA four-index alpha	-0.027	-0.05	-0.231*	-0.023	-0.204*	-0.181*
	(-0.2959)	(-0.5439)	(-2.178)	(-0.2561)	(-1.9577)	(-1.7269)
LA Sharpe ratio	-0.008	-0.02	-0.049*	-0.012	-0.041*	-0.029
	(-0.3899)	(-0.9747)	(-2.0913)	(-0.6061)	(-1.798)	(-1.2717)
LA information ratio	0.018	0.017	0.017	-0.001	-0.001	0
	(0.8207)	(0.7513)	(0.6637)	(-0.0456)	(-0.04)	(0)
LA Jensen alpha	-0.038	-0.078	-0.222*	-0.04	-0.184*	-0.144**
	(-0.3922)	(-0.7993)	(-1.9881)	(-0.419)	(-1.6756)	(-1.3041)
LA four-index alpha	-0.027	-0.05	-0.231*	-0.023	-0.204*	-0.181*
	(-0.2959)	(-0.5439)	(-2.1784)	(-0.2561)	(-1.9577)	(-1.7269)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D16. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

* indicates significance at the 5% level.

Table D33

Summary of Regressions Using Morningstar Ratings as Predictor: U.S. Periodic Funds

Out-of-sample period	Rating period	Load type	Coefficient has correct negative sign				
			Total (out of 16)	4-star funds (out of 4)	3-star funds (out of 4)	2-star funds (out of 4)	1-star funds (out of 4)
Nine years	Jul-02	LA	11 (4)	4 (0)	4 (4)	1 (0)	2 (0)
		Non LA	11 (4)	4 (0)	4 (4)	1 (0)	2 (0)
Four years	Jul-02	LA	16 (12)	4 (4)	4 (4)	4 (2)	4 (2)
		Non LA	16 (12)	4 (4)	4 (4)	4 (2)	4 (2)
	Jul-03	LA	13 (3)	4 (0)	3 (1)	3 (1)	3 (1)
		Non LA	13 (3)	4 (0)	3 (1)	3 (1)	3 (1)
	Jul-04	LA	16 (14)	4 (3)	4 (4)	4 (4)	4 (3)
		Non LA	16 (14)	4 (3)	4 (4)	4 (4)	4 (3)
	Jul-05	LA	16 (11)	4 (3)	4 (4)	4 (4)	4 (0)
		Non LA	16 (11)	4 (3)	4 (4)	4 (4)	4 (0)
	Jul-06	LA	9 (0)	2 (0)	3 (0)	4 (0)	0 (0)
		Non LA	9 (0)	2 (0)	3 (0)	4 (0)	0 (0)
	Jul-07	LA	15 (3)	3 (0)	4 (3)	4 (0)	4 (0)
		Non LA	15 (3)	3 (0)	4 (3)	4 (0)	4 (0)
One year	Jul-02	LA	16 (15)	4 (4)	4 (4)	4 (4)	4 (3)
		Non LA	16 (15)	4 (4)	4 (4)	4 (4)	4 (3)
	Jul-03	LA	14 (10)	4 (3)	4 (2)	3 (2)	3 (3)
		Non LA	14 (10)	4 (3)	4 (2)	3 (2)	3 (3)
	Jul-04	LA	15 (15)	4 (4)	4 (4)	4 (4)	3 (3)
		Non LA	15 (15)	4 (4)	4 (4)	4 (4)	3 (3)
	Jul-05	LA	13 (5)	3 (0)	3 (0)	3 (1)	4 (4)
		Non LA	13 (5)	3 (0)	3 (0)	3 (1)	4 (4)
	Jul-06	LA	16 (10)	4 (2)	4 (2)	4 (2)	4 (4)
		Non LA	16 (10)	4 (2)	4 (2)	4 (2)	4 (4)
	Jul-07	LA	12 (9)	3 (0)	3 (3)	3 (3)	3 (3)
		Non LA	12 (9)	3 (0)	3 (3)	3 (3)	3 (3)
	Jul-08	LA	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		Non LA	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Jul-09	LA	11 (2)	3 (0)	3 (1)	3 (1)	2 (0)
		Non LA	11 (2)	3 (0)	3 (1)	3 (1)	2 (0)
	Jul-10	LA	5 (2)	0 (0)	0 (0)	2 (0)	3 (2)
		Non LA	5 (2)	0 (0)	0 (0)	2 (0)	3 (2)

Note. Significant cases are in parentheses. LA = Load-Adjusted

Table D34

Summary of Tests of Difference in Coefficients: U.S. Periodic Funds

Out-of-sample period	Rating period	Load type	Difference of coefficient has correct negative sign						
			Total (out of 24)	4-star vs. 3-star (out of 4)	4-star vs. 2-star (out of 4)	4-star vs. 1-star (out of 4)	3-star vs. 2-star (out of 4)	3-star vs. 1-star (out of 4)	2-star vs. 1-star (out of 4)
Nine years	Jul-02	LA	10 (0)	4 (0)	0 (0)	2 (0)	0 (0)	0 (0)	4 (0)
		Non LA	10 (0)	4 (0)	0 (0)	2 (0)	0 (0)	0 (0)	4 (0)
Four years	Jul-02	LA	10 (0)	3 (0)	0 (0)	3 (0)	0 (0)	1 (0)	3 (0)
		Non LA	10 (0)	3 (0)	0 (0)	3 (0)	0 (0)	1 (0)	3 (0)
	Jul-03	LA	14 (0)	3 (0)	3 (0)	2 (0)	2 (0)	2 (0)	2 (0)
		Non LA	14 (0)	3 (0)	3 (0)	2 (0)	2 (0)	2 (0)	2 (0)
	Jul-04	LA	18 (0)	4 (0)	3 (0)	3 (0)	2 (0)	3 (0)	3 (0)
		Non LA	18 (0)	4 (0)	3 (0)	3 (0)	2 (0)	3 (0)	3 (0)
	Jul-05	LA	13 (0)	4 (0)	4 (0)	1 (0)	4 (0)	0 (0)	0 (0)
		Non LA	13 (0)	4 (0)	4 (0)	1 (0)	4 (0)	0 (0)	0 (0)
	Jul-06	LA	12 (0)	4 (0)	4 (0)	0 (0)	4 (0)	0 (0)	0 (0)
		Non LA	12 (0)	4 (0)	4 (0)	0 (0)	4 (0)	0 (0)	0 (0)
	Jul-07	LA	18 (0)	4 (0)	4 (0)	4 (0)	0 (0)	2 (0)	4 (0)
		Non LA	18 (0)	4 (0)	4 (0)	4 (0)	0 (0)	2 (0)	4 (0)
One year	Jul-02	LA	5 (0)	1 (0)	1 (0)	1 (0)	0 (0)	1 (0)	1 (0)
		Non LA	5 (0)	1 (0)	1 (0)	1 (0)	0 (0)	1 (0)	1 (0)
	Jul-03	LA	12 (3)	1 (0)	1 (0)	3 (1)	1 (0)	3 (1)	3 (1)
		Non LA	13 (3)	1 (0)	1 (0)	3 (1)	1 (0)	3 (1)	4 (1)
	Jul-04	LA	16 (1)	4 (0)	3 (0)	3 (1)	3 (0)	2 (0)	1 (0)
		Non LA	16 (1)	4 (0)	3 (0)	3 (1)	3 (0)	2 (0)	1 (0)
	Jul-05	LA	22 (2)	3 (0)	3 (0)	4 (0)	4 (0)	4 (1)	4 (1)
		Non LA	22 (2)	3 (0)	3 (0)	4 (0)	4 (0)	4 (1)	4 (1)
	Jul-06	LA	23 (3)	4 (0)	4 (0)	4 (1)	3 (0)	4 (1)	4 (1)
		Non LA	23 (3)	4 (0)	4 (0)	4 (1)	3 (0)	4 (1)	4 (1)
	Jul-07	LA	21 (11)	4 (2)	4 (2)	4 (3)	1 (0)	4 (2)	4 (2)
		Non LA	21 (11)	4 (2)	4 (2)	4 (3)	1 (0)	4 (2)	4 (2)
	Jul-08	LA	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)
		Non LA	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)
	Jul-09	LA	10 (0)	3 (0)	4 (0)	1 (0)	0 (0)	1 (0)	1 (0)
		Non LA	9 (0)	3 (0)	3 (0)	1 (0)	0 (0)	1 (0)	1 (0)
	Jul-10	LA	20 (8)	3 (0)	3 (0)	3 (3)	4 (0)	4 (3)	3 (2)
		Non LA	18 (8)	3 (0)	3 (0)	3 (3)	3 (0)	3 (3)	3 (2)

Note. Significant cases are in parentheses. LA = Load-Adjusted

Canadian Periodic Funds:

Table D35.

Regression Analysis Using Morningstar Star as Predictor: Seven-and-a-Half-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.097* (9.606)	0.003 (0.241)	0.005 (0.393)	0.001 (0.049)	-0.032 (-1.237)	0.562	-0.010
Non LA information ratio	-0.009 (-0.817)	0.009 (0.606)	0.014 (0.979)	0.015 (0.924)	-0.0000 (-0.003)	0.332	-0.016
Non LA Jensen alpha	0.052 (1.013)	0.021 (0.318)	0.012 (0.179)	-0.004 (-0.051)	-0.136 (-1.046)	0.401	-0.014
Non LA four-index alpha	0.006 (0.139)	0.041 (0.759)	0.044 (0.817)	0.019 (0.322)	-0.149** (-1.387)	1.002	0.000
LA Sharpe ratio	0.097* (9.580)	0.003 (0.244)	0.005 (0.396)	0.000 (0.012)	-0.032 (-1.236)	0.566	-0.010
LA information ratio	-0.010 (-0.860)	0.009 (0.614)	0.014 (0.987)	0.014 (0.876)	-0.000 (-0.004)	0.320	-0.016
LA Jensen alpha	0.051 (1.00)	0.021 (0.320)	0.012 (0.183)	-0.004 (-0.050)	0.136 (-1.051)	0.406	-0.014
LA four-index alpha	0.005 (0.121)	0.041 (0.763)	0.044 (0.822)	0.019 (0.324)	-0.149** (-1.388)	1.008	0.000

Note. Sample size of 176 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to December 2009. *t*-statistics are in the parentheses.

LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D36.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.281* (15.720)	-0.033** (-1.431)	-0.036** (-1.574)	-0.057* (-2.233)	-0.099* (-2.173)	1.907	0.020
Non LA information ratio	-0.009 (-0.451)	-0.005 (-0.189)	0.010 (0.372)	0.003 (0.111)	0.012 (0.234)	0.115	-0.021
Non LA Jensen alpha	0.219* (2.838)	-0.118 (-1.194)	-0.168* (-1.708)	-0.236* (-2.165)	-0.352* (-1.795)	1.644	0.015
Non LA four-index alpha	0.122* (2.260)	-0.084 (-1.208)	-0.094** (-1.357)	-0.184* (-2.402)	-0.272* (-1.971)	1.947	0.021
LA Sharpe ratio	0.281* (15.714)	-0.033** (-1.429)	-0.036** (-1.571)	-0.060* (-2.357)	-0.099* (-2.174)	2.023**	0.023
LA information ratio	-0.010 (-0.509)	-0.005 (-0.174)	0.010 (0.386)	-0.002 (-0.064)	0.012 (0.232)	0.124	-0.020
LA Jensen alpha	0.217* (2.831)	-0.117 (-1.194)	-0.168* (-1.707)	-0.235* (-2.167)	-0.353* (-1.802)	1.650	0.015
LA four-index alpha	0.121* (2.249)	-0.083 (-1.208)	-0.094** (-1.357)	-0.183* (-2.403)	-0.272* (-1.976)	1.951	0.021

Note. Sample size of 176 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2006. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D37.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.421* (19.231)	0.010 (0.339)	-0.009 (-0.338)	-0.038 (-1.190)	-0.081* (-1.784)	1.496	0.010
Non LA information ratio	-0.013 (-0.557)	-0.016 (-0.499)	0.001 (0.026)	-0.018 (-0.507)	0.032 (0.648)	0.354	-0.013
Non LA Jensen alpha	0.251* (4.360)	-0.112** (-1.491)	-0.181* (-2.560)	-0.248* (-2.953)	-0.246* (-2.066)	2.839*	0.036
Non LA four-index alpha	0.154* (2.699)	-0.050 (-0.664)	-0.074 (-1.051)	-0.230* (-2.763)	-0.280* (-2.367)	3.013*	0.039
LA Sharpe ratio	0.421* (19.206)	0.010 (0.339)	-0.009 (-0.332)	-0.039 (-1.235)	-0.081* (-1.784)	1.532	0.011
LA information ratio	-0.015 (-0.637)	-0.016 (-0.496)	0.002 (0.056)	-0.020 (-0.569)	0.032 (0.644)	0.384	-0.013
LA Jensen alpha	0.249* (4.337)	-0.111** (-1.484)	-0.180* (-2.549)	-0.247* (-2.951)	-0.246* (-2.073)	2.835*	0.036
LA four-index alpha	0.152* (2.674)	-0.049 (-0.658)	-0.073 (-1.037)	-0.229* (-2.760)	-0.279* (-2.370)	3.021*	0.039

Note. Sample size of 200 included those funds that had an overall rating on July 1, 2003. Out-of-sample returns data used for the analysis is from July 2003 to June 2007. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D38.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.158* (5.998)	0.050 (1.550)	0.056 (1.843)	0.002 (0.066)	0.067 (1.450)	1.803	0.014
Non LA information ratio	-0.108* (-3.615)	0.028 (0.750)	0.054 (1.541)	-0.013 (-0.324)	0.116 (2.210)	2.438*	0.025
Non LA Jensen alpha	-0.177* (-2.211)	0.083 (0.839)	0.093 (0.996)	-0.091 (-0.876)	0.109 (0.779)	1.584	0.010
Non LA four-index alpha	-0.156* (-2.312)	0.089 (1.071)	0.056 (0.718)	-0.030 (-0.346)	0.114 (0.964)	0.924	-0.001
LA Sharpe ratio	0.157* (5.984)	0.050 (1.551)	0.056 (1.843)	0.002 (0.065)	0.067 (1.449)	1.804	0.014
LA information ratio	-0.110* (-3.654)	0.028 (0.751)	0.054 (1.542)	-0.013 (-0.324)	0.116 (2.203)	2.431*	0.025
LA Jensen alpha	-0.178* (-2.228)	0.083 (0.843)	0.093 (1.001)	-0.090 (-0.872)	0.109 (0.776)	1.583	0.010
LA four-index alpha	-0.157* (-2.333)	0.089 (1.077)	0.056 (0.723)	-0.029 (-0.340)	0.113 (0.961)	0.923	-0.001

Note. Sample size of 226 included those funds that had an overall rating on July 1, 2004. Out-of-sample returns data used for the analysis is from July 2004 to June 2008. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D39.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	-0.033* (-2.555)	0.010 (0.663)	0.020 (1.425)	0.007 (0.423)	-0.015 (-0.653)	1.228	0.004
Non LA information ratio	-0.031* (-2.412)	0.010 (0.674)	0.021 (1.434)	0.007 (0.426)	-0.015 (-0.653)	1.239	0.004
Non LA Jensen alpha	-0.167* (-2.232)	0.083 (0.923)	0.140 (1.673)	0.081 (0.822)	-0.046 (-0.353)	1.213	0.003
Non LA four-index alpha	-0.191* (-2.451)	0.071 (0.764)	0.130 (1.484)	0.053 (0.520)	-0.070 (-0.512)	1.152	0.002
LA Sharpe ratio	-0.033* (-2.571)	0.010 (0.666)	0.020 (1.428)	0.007 (0.425)	-0.015 (-0.654)	1.232	0.004
LA information ratio	-0.031* (-2.427)	0.010 (0.677)	0.021 (1.437)	0.007 (0.428)	-0.015 (-0.654)	1.242	0.004
LA Jensen alpha	-0.168* (-2.252)	0.083 (0.930)	0.140 (1.683)	0.081 (0.830)	-0.046 (-0.351)	1.223	0.004
LA four-index alpha	-0.192* (-2.470)	0.072 (0.771)	0.130 (1.493)	0.054 (0.527)	-0.070 (-0.510)	1.160	0.003

Note. Sample size of 245 included those funds that had an overall rating on July 1, 2005. Out-of-sample returns data used for the analysis is from July 2005 to June 2009. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D40.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	-0.101* (-4.467)	-0.018 (-0.609)	-0.020 (-0.682)	-0.010 (-0.310)	0.000 (-0.005)	0.152	-0.020
Non LA information ratio	0.012 (0.535)	-0.031 (-1.098)	-0.038** (-1.326)	-0.039 (-1.219)	-0.050 (-0.873)	0.573	-0.010
Non LA Jensen alpha	-0.045 (-0.521)	-0.105 (-0.953)	-0.073 (-0.660)	-0.033 (-0.266)	-0.097 (-0.438)	0.269	-0.017
Non LA four-index alpha	0.060 (0.642)	-0.104 (-0.869)	-0.152 (-1.275)	-0.186** (-1.399)	-0.370** (-1.556)	0.919	-0.002
LA Sharpe ratio	-0.102* (-4.482)	-0.018 (-0.605)	-0.020 (-0.677)	-0.010 (-0.306)	0.000 (-0.005)	0.150	-0.020
LA information ratio	0.012 (0.544)	-0.031 (-1.100)	-0.038** (-1.329)	-0.039 (-1.221)	-0.050 (-0.873)	0.575	-0.010
LA Jensen alpha	-0.045 (-0.527)	-0.105 (-0.955)	-0.073 (-0.663)	-0.033 (-0.271)	-0.097 (-0.440)	0.269	-0.017
LA four-index alpha	0.059 (0.635)	-0.103 (-0.870)	-0.152 (-1.275)	-0.186** (-1.403)	-0.370** (-1.561)	0.924	-0.002

Note. Sample size of 176 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2003. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D41.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.675* (23.016)	-0.020 (-0.523)	-0.097* (-2.700)	-0.119* (-2.790)	-0.171* (-2.818)	4.398*	0.064
Non LA information ratio	0.091* (2.644)	-0.030 (-0.665)	-0.086* (-2.031)	-0.085* (-1.708)	-0.016 (-0.223)	1.489	0.010
Non LA Jensen alpha	0.754* (8.096)	-0.215* (-1.766)	-0.449* (-3.918)	-0.381* (-2.805)	-0.398* (-2.068)	4.383*	0.064
Non LA four-index alpha	0.111 (0.984)	-0.073 (-0.496)	-0.118 (-0.852)	-0.262** (-1.588)	-0.332** (-1.421)	0.960	-0.001
LA Sharpe ratio	0.675* (22.909)	-0.020 (-0.521)	-0.097* (-2.684)	-0.121* (-2.807)	-0.171* (-2.806)	4.390*	0.064
LA information ratio	0.088* (2.549)	-0.030 (-0.662)	-0.084* (-1.997)	-0.085* (-1.705)	-0.016 (-0.224)	1.449	0.009
LA Jensen alpha	0.749* (8.088)	-0.214* (-1.765)	-0.446* (-3.910)	-0.379* (-2.807)	-0.397* (-2.075)	4.372*	0.063
LA four-index alpha	0.110 (0.976)	-0.073 (-0.497)	-0.117 (-0.846)	-0.260** (-1.586)	-0.331** (-1.424)	0.960	-0.001

Note. Sample size of 200 included those funds that had an overall rating on July 1, 2003. Out-of-sample returns data used for the analysis is from July 2003 to June 2004. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D42.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.376* (7.663)	0.094 (1.555)	0.016 (0.286)	-0.066 (-1.040)	-0.092 (-1.071)	2.865*	0.032
Non LA information ratio	-0.049 (-1.128)	0.047 (0.887)	0.020 (0.388)	-0.093* (-1.654)	-0.015 (-0.202)	2.442*	0.025
Non LA Jensen alpha	-0.109 (-0.763)	0.201 (1.148)	0.072 (0.432)	-0.303** (-1.637)	-0.356** (-1.420)	3.568*	0.044
Non LA four-index alpha	0.165 (0.973)	0.093 (0.446)	-0.282** (-1.433)	-0.071 (-0.325)	-1.309* (-4.403)	7.310*	0.101
LA Sharpe ratio	0.376* (7.657)	0.094 (1.555)	0.016 (0.286)	-0.066 (-1.041)	-0.092 (-1.072)	2.867*	0.032
LA information ratio	-0.051 (-1.177)	0.047 (0.884)	0.020 (0.389)	-0.093* (-1.656)	-0.016 (-0.207)	2.443*	0.025
LA Jensen alpha	-0.109 (-0.763)	0.200 (1.144)	0.070 (0.426)	-0.303** (-1.644)	-0.354** (-1.421)	3.570*	0.044
LA four-index alpha	0.163 (0.967)	0.093 (0.450)	-0.281** (-1.432)	-0.071 (-0.327)	-1.301* (-4.399)	7.304*	0.101

Note. Sample size of 226 included those funds that had an overall rating on July 1, 2004. Out-of-sample returns data used for the analysis is from July 2004 to June 2005. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D43.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.276* (8.544)	-0.007 (-0.181)	-0.033 (-0.905)	-0.055** (-1.295)	-0.125* (-2.201)	1.753	0.012
Non LA information ratio	-0.026 (-0.619)	-0.028 (-0.553)	-0.045 (-0.938)	-0.065 (-1.152)	-0.144* (-1.923)	1.085	0.001
Non LA Jensen alpha	0.075 (0.614)	-0.111 (-0.760)	-0.128 (-0.937)	-0.233** (-1.457)	-0.430* (-2.016)	1.260	0.004
Non LA four-index alpha	-0.135 (-1.207)	0.008 (0.058)	0.005 (0.043)	-0.099 (-0.670)	-0.284** (-1.445)	0.926	-0.001
LA Sharpe ratio	0.275* (8.526)	-0.007 (-0.178)	-0.033 (-0.903)	-0.055** (-1.293)	-0.125* (-2.202)	1.756	0.012
LA information ratio	-0.029 (-0.672)	-0.028 (-0.540)	-0.045 (-0.927)	-0.065 (-1.144)	-0.145* (-1.926)	1.090	0.001
LA Jensen alpha	0.072 (0.595)	-0.109 (-0.754)	-0.126 (-0.930)	-0.231** (-1.453)	-0.427* (-2.014)	1.258	0.004
LA four-index alpha	-0.137 (-1.228)	0.008 (0.063)	0.006 (0.051)	-0.097 (-0.665)	-0.282** (-1.442)	0.927	-0.001

Note. Sample size of 245 included those funds that had an overall rating on July 1, 2005. Out-of-sample returns data used for the analysis is from July 2005 to June 2006. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D44.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	0.534* (11.169)	0.018 (0.323)	0.058 (1.085)	0.057 (0.970)	-0.174* (-2.175)	3.160*	0.044
Non LA information ratio	0.036 (0.882)	-0.036 (-0.781)	-0.027 (-0.592)	-0.011 (-0.214)	-0.103** (-1.520)	0.720	-0.004
Non LA Jensen alpha	0.288* (2.138)	-0.061 (-0.394)	-0.108 (-0.711)	0.154 (0.932)	-0.211 (-0.935)	1.522	0.007
Non LA four-index alpha	0.054 (0.324)	0.111 (0.580)	0.107 (0.567)	0.430 (2.093)	-0.110 (-0.394)	2.017**	0.014
LA Sharpe ratio	0.553* (11.157)	0.018 (0.323)	0.058 (1.087)	0.057 (0.967)	-0.174* (-2.175)	3.160*	0.030
LA information ratio	0.032 (0.785)	-0.036 (-0.780)	-0.027 (-0.586)	-0.012 (-0.232)	-0.103** (-1.513)	0.705	-0.004
LA Jensen alpha	0.284* (2.121)	-0.060 (-0.391)	-0.107 (-0.707)	0.153 (0.931)	-0.210 (-0.936)	1.515	0.007
LA four-index alpha	0.052 (0.312)	0.111 (0.582)	0.106 (0.569)	0.427 (2.088)	-0.110 (-0.394)	2.006**	0.014

Note. Sample size of 282 included those funds that had an overall rating on July 1, 2006. Out-of-sample returns data used for the analysis is from July 2006 to June 2007. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D45.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	-0.111* (-2.242)	0.064 (1.119)	-0.038 (-0.700)	-0.102* (-1.712)	-0.040 (-0.490)	3.823*	0.036
Non LA information ratio	-0.140* (-2.798)	0.061 (1.055)	-0.042 (-0.760)	-0.108* (-1.784)	-0.044 (-0.529)	3.853*	0.037
Non LA Jensen alpha	-0.564* (-2.910)	0.383 (1.702)	0.009 (0.043)	-0.218 (-0.929)	0.125 (0.384)	3.237*	0.029
Non LA four-index alpha	-0.579* (-2.400)	0.412 (1.473)	0.085 (0.320)	-0.181 (-0.621)	0.363 (0.899)	2.136**	0.015
LA Sharpe ratio	-0.111* (-2.250)	0.064 (1.119)	-0.038 (-0.699)	-0.102* (-1.713)	-0.040 (-0.489)	3.824*	0.036
LA information ratio	-0.141* (-2.808)	0.061 (1.054)	-0.042 (-0.758)	-0.108* (-1.785)	-0.044 (-0.528)	3.854*	0.037
LA Jensen alpha	-0.562* (-2.917)	0.381 (1.704)	0.008 (0.040)	-0.216 (-0.928)	0.121 (0.376)	3.241*	0.029
LA four-index alpha	-0.577* (-2.404)	0.410 (1.474)	0.084 (0.317)	-0.179 (-0.619)	0.358 (0.892)	2.132**	0.015

Note. Sample size of 302 included those funds that had an overall rating on July 1, 2007. Out-of-sample returns data used for the analysis is from July 2007 to June 2008. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D46.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj. R^2
Non LA Sharpe ratio	-0.272* (-13.74)	-0.010 (-0.453)	0.016 (0.755)	0.035 (1.468)	0.083 (2.889)	4.589*	0.037
Non LA information ratio	0.042* (1.694)	-0.009 (-0.297)	0.024 (0.873)	0.034 (1.132)	0.069 (1.896)	2.197**	0.013
Non LA Jensen alpha	0.085 (0.516)	-0.100 (-0.524)	0.091 (0.506)	0.203 (1.038)	0.651 (2.729)	3.965*	0.031
Non LA four-index alpha	-0.500** (-1.400)	-0.120 (-0.291)	-0.023 (-0.057)	-0.624** (-1.468)	-0.500 (-0.965)	1.417	0.004
LA Sharpe ratio	-0.272* (-13.74)	-0.010 (-0.453)	0.016 (0.755)	0.035 (1.468)	0.083 (2.889)	4.589*	0.037
LA information ratio	0.043* (1.740)	-0.009 (-0.300)	0.024 (0.866)	0.034 (1.128)	0.069 (1.895)	2.195**	0.013
LA Jensen alpha	0.084 (0.513)	-0.099 (-0.523)	0.091 (0.507)	0.203 (1.040)	0.648 (2.727)	3.958*	0.031
LA four-index alpha	-0.499** (-1.402)	-0.119 (-0.289)	-0.022 (-0.056)	-0.621** (-1.466)	-0.497 (-0.962)	1.413	0.004

Note. Sample size of 375 included those funds that had an overall rating on July 1, 2008. Out-of-sample returns data used for the analysis is from July 2008 to June 2009. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D47.

Tests of Differences in Coefficients: Seven-and-a-Half-Year: July 2002

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.002 (0.1088)	-0.002 (-0.1047)	-0.035 (-1.204)	-0.004 (-0.2094)	-0.037 (-1.2728)	-0.033 (-1.1175)
Non LA information ratio	0.005 (0.2525)	0.006 (0.2822)	-0.0091 (-0.2899)	0.001 (0.047)	-0.0141 (-0.4496)	-0.0151 (-0.4674)
Non LA Jensen alpha	-0.009 (-0.0979)	-0.025 (-0.2577)	-0.157 (-1.0980)	-0.016 (-0.1649)	-0.148 (-1.0183)	-0.132 (-0.8882)
Non LA four-index alpha	0.003 (0.0393)	-0.022 (-0.2725)	-0.19** (-1.5735)	-0.025 (-0.3097)	-0.193** (-1.5984)	-0.168** (-1.3598)
LA Sharpe ratio	0.002 (0.1088)	-0.003 (-0.1570)	-0.035 (-1.204)	-0.005 (-0.2617)	-0.037 (-1.2728)	-0.032 (-1.0837)
LA information ratio	0.005 (0.2525)	0.005 (0.2352)	-0.009 (-0.2875)	0 (0)	-0.014 (-0.4472)	-0.014 (-0.4341)
LA Jensen alpha	-0.009 (-0.0979)	-0.025 (-0.2577)	-0.157 (-1.0802)	-0.016 (-0.1649)	-0.148 (-1.0183)	-0.132 (-0.8882)
LA four-index alpha	0.003 (0.0393)	-0.022 (-0.2725)	-0.19** (-1.5853)	-0.025 (-0.3097)	-0.193** (-1.6103)	-0.168** (-1.3695)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D33. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D48.

Tests of Differences in Coefficients: Four-Year: July 2002

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.003 (-0.0922)	-0.024 (-0.7065)	-0.066** (-1.2833)	-0.021 (-0.6182)	-0.063 (-1.225)	-0.042 (-0.8022)
Non LA information ratio	0.015 (0.4079)	0.008 (0.2054)	0.017 (0.2970)	-0.007 (-0.1797)	0.002 (0.0349)	0.009 (0.1534)
Non LA Jensen alpha	-0.05 (-0.3608)	-0.118 (-0.8050)	-0.234 (-1.0678)	-0.068 (-0.4639)	-0.184 (-0.8397)	-0.116 (-0.5172)
Non LA four-index alpha	-0.01 (-0.1025)	-0.1 (-0.9672)	-0.188 (-1.2185)	-0.09 (-0.8705)	-0.178 (-1.1537)	-0.088 (-0.5569)
LA Sharpe ratio	-0.003 (-0.0922)	-0.027 (-0.7948)	-0.066** (-1.2833)	-0.024 (-0.7065)	-0.063 (-1.225)	-0.039 (-0.7449)
LA information ratio	0.015 (0.4076)	0.003 (0.0770)	0.017 (0.2924)	-0.012 (-0.3081)	0.002 (0.0344)	0.014 (0.2351)
LA Jensen alpha	-0.051 (-0.368)	-0.118 (-0.8050)	-0.236 (-1.077)	-0.067 (-0.4571)	-0.185 (-0.8442)	-0.118 (-0.5262)
LA four-index alpha	-0.011 (-0.1127)	-0.1 (-0.9742)	-0.189 (-1.225)	-0.089 (-0.867)	-0.178 (-1.1537)	-0.089 (-0.5649)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D34. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D49.

Tests of Differences in Coefficients: Four-Year: July 2003

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.019	-0.048	-0.091*	-0.029	-0.072**	-0.043
	(-0.4795)	(-1.1115)	(-1.6998)	(-0.6926)	(-1.372)	(-0.7787)
Non LA information ratio	0.017	-0.002	0.048	-0.019	0.031	0.05
	(0.4005)	(-0.0428)	(0.8278)	(-0.418)	(0.5445)	(0.8303)
Non LA Jensen alpha	-0.069	-0.136	-0.134	-0.067	-0.065	0.002
	(-0.6681)	(-1.2077)	(-0.9526)	(-0.6092)	(-0.4691)	(0.0137)
Non LA four-index alpha	-0.024	-0.18**	-0.23*	-0.156**	-0.206**	-0.05
	(-0.2339)	(-1.6091)	(-1.645)	(-1.4368)	(-1.5015)	(-0.3466)
LA Sharpe ratio	-0.019	-0.049	-0.091*	-0.03	-0.072**	-0.042
	(-0.4795)	(-1.1346)	(-1.6998)	(-0.7165)	(-1.372)	(-0.7606)
LA information ratio	0.018	-0.004	0.048	-0.022	0.03	0.052
	(0.4240)	(-0.0856)	(0.8159)	(-0.484)	(0.5190)	(0.852)
LA Jensen alpha	-0.069	-0.136	-0.135	-0.067	-0.066	0.001
	(-0.6681)	(-1.2077)	(-0.9597)	(-0.6092)	(-0.4763)	(0.0069)
LA four-index alpha	-0.024	-0.18**	-0.23*	-0.156**	-0.206**	-0.05
	(-0.2356)	(-1.6187)	(-1.6513)	(-1.4368)	(-1.5015)	(-0.3466)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D35. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D50.

Tests of Differences in Coefficients: Four-Year: July 2004

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.006	-0.048	0.017	-0.054	0.011	0.065
	(0.1347)	(-1.0281)	(0.3034)	(-1.1736)	(0.1983)	(1.1363)
Non LA information ratio	0.026	-0.041	0.088	-0.067	0.062	0.129
	(0.5105)	(-0.7627)	(1.3614)	(-1.2786)	(0.9762)	(1.9604)
Non LA Jensen alpha	0.01	-0.174	0.026	-0.184**	0.016	0.2
	(0.0736)	(-1.2118)	(0.1509)	(-1.3188)	(0.0947)	(1.1415)
Non LA four-index alpha	-0.033	-0.119	0.025	-0.086	0.058	0.144
	(-0.2897)	(-0.9897)	(0.1733)	(-0.736)	(0.4100)	(0.9822)
LA Sharpe ratio	0.006	-0.048	0.017	-0.054	0.011	0.065
	(0.1347)	(-1.0281)	(0.3034)	(-1.1736)	(0.1983)	(1.1363)
LA information ratio	0.026	-0.041	0.088	-0.067	0.062	0.129
	(0.5105)	(-0.7627)	(1.3614)	(-1.2786)	(0.9762)	(1.9604)
LA Jensen alpha	0.01	-0.173	0.026	-0.183**	0.016	0.199
	(0.0740)	(-1.2168)	(0.1521)	(-1.3187)	(0.0952)	(1.1449)
LA four-index alpha	-0.033	-0.118	0.024	-0.085	0.057	0.142
	(-0.2916)	(-0.9870)	(0.1670)	(-0.7275)	(0.4029)	(0.9686)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D36. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D51.

Tests of Differences in Coefficients: Four-Year: July 2005

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.01 (0.4874)	-0.003 (-0.1323)	-0.025 (-0.9389)	-0.013 (-0.5903)	-0.035** (-1.3422)	-0.022 (-0.7913)
Non LA information ratio	0.011 (0.5361)	-0.003 (-0.1323)	-0.025 (-0.9389)	-0.014 (-0.6357)	-0.036** (-1.3805)	-0.022 (-0.7913)
Non LA Jensen alpha	0.057 (0.4658)	-0.002 (-0.0151)	-0.129 (-0.8145)	-0.059 (-0.4571)	-0.186 (-1.1952)	-0.127 (-0.7763)
Non LA four-index alpha	0.059 (0.4633)	-0.018 (-0.1297)	-0.141 (-0.8515)	-0.077 (-0.5711)	-0.2 (-1.2324)	-0.123 (-0.7176)
LA Sharpe ratio	0.01 (0.4874)	-0.003 (-0.1323)	-0.025 (-0.9389)	-0.013 (-0.5903)	-0.035** (-1.3422)	-0.022 (0.7913)
LA information ratio	0.011 (0.5361)	-0.003 (-0.1323)	-0.025 (-0.9389)	-0.014 (-0.6357)	-0.036** (-1.3805)	-0.022 (-7913)
LA Jensen alpha	0.057 (0.4684)	-0.002 (-0.0151)	-0.129 (-0.8145)	-0.059 (-0.4594)	-0.186 (-1.1994)	-0.127 (-0.7763)
LA four-index alpha	0.058 (0.4554)	-0.018 (-0.1304)	-0.142 (-0.8619)	-0.076 (-0.5669)	-0.2 (-1.2388)	-0.124 (-0.7294)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D37. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D52.

Tests of Differences in Coefficients: One-Year: July 2002

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.002 (-0.0488)	0.008 (0.1852)	0.018 (0.2776)	0.01 (0.2316)	0.02 (0.3084)	0.01 (0.1509)
Non LA information ratio	-0.007 (-0.1707)	-0.008 (-0.1853)	-0.019 (-0.2971)	-0.001 (-0.0232)	-0.012 (-0.1876)	-0.011 (-0.1683)
Non LA Jensen alpha	0.032 (0.2039)	0.072 (0.4345)	0.008 (0.0324)	0.04 (0.2414)	-0.024 (-0.097)	-0.064 (-0.253)
Non LA four-index alpha	-0.048 (-0.2852)	-0.082 (-0.4595)	-0.266 (-0.9997)	-0.034 (-0.1905)	-0.218 (-0.8193)	-0.184 (-0.6749)
LA Sharpe ratio	-0.002 (-0.0488)	0.008 (0.1852)	0.018 (0.2776)	0.01 (0.2316)	0.02 (0.3084)	0.01 (0.1509)
LA information ratio	-0.007 (--0.1707)	-0.008 (-0.1853)	-0.019 (-0.2971)	-0.001 (-0.0232)	-0.012 (-0.1876)	-0.011 (-0.1683)
LA Jensen alpha	0.032 (0.2057)	0.072 (0.4363)	0.008 (0.0325)	0.04 (0.2424)	-0.024 (-0.0976)	-0.064 (-0.2539)
LA four-index alpha	-0.049 (-0.2912)	-0.083 (-0.4651)	-0.267 (-1.0068)	-0.034 (-0.1905)	-0.218 (-0.822)	-0.184 (-0.677)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D38. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D53.

Tests of Differences in Coefficients: One-Year: July 2003

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.077**	-0.099**	-0.151*	-0.022	-0.074	-0.052
	(-1.471)	(-1.7252)	(-2.1011)	(-0.3923)	(-1.0447)	(-0.6967)
Non LA information ratio	-0.056	-0.055	0.014	0.001	0.07	0.069
	(-0.9098)	(-0.8176)	(0.1666)	(0.0153)	(0.8486)	(0.7946)
Non LA Jensen alpha	-0.234**	-0.166	-0.183	0.068	0.051	-0.017
	(-1.3957)	(-0.9086)	(-0.8015)	(0.3818)	(0.2270)	(-0.072)
Non LA four-index alpha	-0.045	-0.189	-0.259	-0.144	-0.214	-0.07
	(-0.2216)	(-0.8527)	(-0.9354)	(-0.6675)	(-0.7863)	(-0.2445)
LA Sharpe ratio	-0.077**	-0.101**	-0.151*	-0.024	-0.074	-0.05
	(-1.471)	(-1.7601)	(-2.1011)	(-0.428)	(-1.0447)	(-0.67)
LA information ratio	-0.054	-0.055	0.014	-0.001	0.068	0.069
	(-0.8773)	(-0.8176)	(0.1666)	(-0.0153)	(0.8243)	(0.7946)
LA Jensen alpha	-0.232**	-0.165	-0.183	0.067	0.049	-0.018
	(-1.3955)	(-0.9101)	(-0.8094)	(0.3792)	(0.2203)	(-0.077)
LA four-index alpha	-0.044	-0.187	-0.258	-0.143	-0.214	-0.071
	(-0.2182)	(-0.8491)	(-0.9394)	(-0.6672)	(-0.7928)	(-0.2499)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D39. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D54.

Tests of Differences in Coefficients: One-Year: July 2004

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.078	-0.16*	-0.186*	-0.082	-0.108	-0.026
	(-0.9425)	(-1.8391)	(-1.7738)	(-0.9652)	(-1.0468)	(-0.2439)
Non LA information ratio	-0.027	-0.14*	-0.062	-0.113**	-0.035	0.078
	(-0.3706)	(-1.8157)	(-0.6691)	(-1.5052)	(-0.3847)	(0.8262)
Non LA Jensen alpha	-0.129	-0.504*	-0.557*	-0.375**	-0.428**	-0.053
	(-0.5332)	(-1.9738)	(-1.8218)	(-1.5087)	(-1.4262)	(-0.1704)
Non LA four-index alpha	-0.375**	-0.164	-1.402*	0.211	-1.027*	-1.238*
	(-1.309)	(-0.5417)	(-3.8666)	(0.7145)	(-2.8816)	(-3.3495)
LA Sharpe ratio	-0.078	-0.16*	-0.186*	-0.082	-0.108	-0.026
	(-0.9425)	(-1.8391)	(-1.7738)	(-0.9652)	(-1.0468)	(-0.2439)
LA information ratio	-0.027	-0.14*	-0.063	-0.113**	-0.036	0.077
	(-0.3706)	(-1.8157)	(-0.6799)	(-1.5052)	(-0.3957)	(0.8157)
LA Jensen alpha	-0.13	-0.503*	-0.554*	-0.373**	-0.424**	-0.051
	(-0.5405)	(-1.9809)	(-1.8203)	(-1.5092)	(-1.4195)	(-0.1647)
LA four-index alpha	-0.374**	-0.164	-1.394*	0.21	-1.02*	-1.23*
	(-1.312)	(-0.5455)	(-3.8594)	(0.7163)	(-2.8732)	(-3.3459)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D40. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D55.

Tests of Differences in Coefficients: One-Year: July 2005

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.026 (-0.4899)	-0.048 (-0.8375)	-0.118* (-1.7085)	-0.022 (-0.3977)	-0.092** (-1.3646)	-0.07 (-0.9887)
Non LA information ratio	-0.017 (-0.2427)	-0.037 (-0.4885)	-0.116 (-1.279)	-0.02 (-0.2712)	-0.099 (-1.1118)	-0.079 (-0.844)
Non LA Jensen alpha	-0.017 (-0.0852)	-0.122 (-0.5633)	-0.319 (-1.2353)	-0.105 (-0.5)	-0.302 (-1.195)	-0.197 (-0.7395)
Non LA four-index alpha	-0.003 (-0.0163)	-0.107 (-0.5379)	-0.292 (-1.2256)	-0.104 (-0.5372)	-0.289 (-1.2358)	-0.185 (-0.7526)
LA Sharpe ratio	-0.026 (-0.4899)	-0.048 (-0.8375)	-0.118* (-1.7085)	-0.022 (-0.3977)	-0.092** (-1.3646)	-0.07 (-0.9887)
LA information ratio	-0.017 (-0.2427)	-0.037 (-0.4885)	-0.117 (-1.29)	-0.02 (-0.2712)	-0.1 (-1.123)	-0.08 (-0.8547)
LA Jensen alpha	-0.017 (-0.0855)	-0.122 (-0.5669)	-0.318 (-1.2381)	-0.105 (-0.5018)	-0.301 (-1.195)	-0.196 (-0.7396)
LA four-index alpha	-0.002 (-0.0109)	-0.105 (-0.5279)	-0.29 (-1.2257)	-0.103 (-0.5338)	-0.288 (-1.2434)	-0.185 (-0.7576)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D41. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D56.

Tests of Differences in Coefficients: One-Year: July 2006

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.04 (0.5189)	0.039 (0.4835)	-0.192* (-1.9777)	-0.001 (-0.0125)	-0.232* (-2.4037)	-0.231* (-2.3239)
Non LA information ratio	0.009 (0.1384)	0.025 (0.3679)	-0.067 (-0.8161)	0.016 (0.2355)	-0.076 (-0.9257)	-0.092 (-1.09)
Non LA Jensen alpha	-0.047 (-0.2172)	0.215 (0.9495)	-0.15 (-0.5501)	0.262 (1.164)	-0.103 (-0.3793)	-0.365** (-1.3054)
Non LA four-index alpha	-0.004 (-0.0149)	0.319 (1.1328)	-0.221 (-0.6509)	0.323 (1.1582)	-0.217 (-0.6434)	-0.54** (-1.5534)
LA Sharpe ratio	0.04 (0.5189)	0.039 (0.4835)	-0.192* (-1.9777)	-0.001 (-0.0125)	-0.232* (-2.4037)	-0.231* (-2.3239)
LA information ratio	0.009 (0.1384)	0.024 (0.3532)	-0.067 (-0.8161)	0.015 (0.2208)	-0.076 (-0.9257)	-0.091 (-1.0782)
LA Jensen alpha	-0.047 (-0.2179)	0.213 (0.9437)	-0.15 (-0.5518)	0.26 (1.1625)	-0.103 (-0.3813)	-0.363** (-1.3048)
LA four-index alpha	-0.005 (-0.0187)	0.316 (1.1308)	-0.221 (-0.6652)	0.321 (1.1599)	-0.216 (-0.6447)	-0.537** (-1.5573)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D42. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D57.

Tests of Differences in Coefficients: One-Year: July 2007

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	-0.102**	-0.166*	-0.104	-0.064	-0.002	0.062
	(-1.2991)	(-2.0058)	(-1.0414)	(-0.7928)	(-0.0204)	(0.6102)
Non LA information ratio	-0.103**	-0.169*	-0.105	-0.066	-0.002	0.064
	(-1.2886)	(-2.0252)	(-1.0286)	(-0.8109)	(-0.0199)	(0.6199)
Non LA Jensen alpha	-0.374	-0.601*	-0.258	-0.227	0.116	0.343
	(-1.2044)	(-1.8514)	(-0.6541)	(-0.7159)	(0.2987)	(0.8582)
Non LA four-index alpha	-0.327	-0.593**	-0.049	-0.266	0.278	0.544
	(-0.8452)	(-1.4684)	(-0.0997)	(-0.6735)	(0.5741)	(1.0926)
LA Sharpe ratio	-0.102**	-0.166*	-0.104	-0.064	-0.002	0.062
	(-1.2991)	(-2.0058)	(-1.0329)	(-0.7928)	(-0.0202)	(0.6054)
LA information ratio	-0.103**	-0.169*	-0.105	-0.066	-0.002	0.064
	(-1.2886)	(-2.0252)	(-1.0286)	(-0.8109)	(-0.0199)	(0.6199)
LA Jensen alpha	-0.373	-0.597*	-0.26	-0.224	0.113	0.337
	(-1.2067)	(-1.8471)	(-0.6615)	(-0.7096)	(0.2921)	(0.8462)
LA four-index alpha	-0.326	-0.589**	-0.052	-0.263	0.274	0.537
	(-0.8488)	(-1.4662)	(-0.1066)	(-0.6695)	(0.5701)	(1.0851)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D43. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table D58.

Tests of Differences in Coefficients: One-Year: July 2008

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
Non LA Sharpe ratio	0.026	0.045	0.093	0.019	0.067	0.048
	(0.8169)	(1.3537)	(2.5126)	(0.5836)	(1.8406)	(1.2751)
Non LA information ratio	0.033	0.043	0.078	0.01	0.045	0.035
	(0.8328)	(1.0306)	(1.6873)	(0.2478)	(1.00)	(0.7469)
Non LA Jensen alpha	0.191	0.303	0.751	0.112	0.56	0.448
	(0.7279)	(1.1099)	(2.4597)	(0.4198)	(1.8679)	(1.4494)
Non LA four-index alpha	0.097	-0.504	-0.38	-0.601	-0.477	0.124
	(0.1704)	(-0.8505)	(-0.5736)	(-1.0395)	(-0.7343)	(0.1851)
LA Sharpe ratio	0.026	0.045	0.093	0.019	0.067	0.048
	(0.8169)	(1.3537)	(2.5126)	(0.5836)	(1.8406)	(1.2751)
LA information ratio	0.033	0.043	0.078	0.01	0.045	0.035
	(0.8328)	(1.0306)	(1.6873)	(0.2478)	(1.00)	(0.7469)
LA Jensen alpha	0.19	0.302	0.747	0.112	0.557	0.445
	(0.7279)	(1.1121)	(2.4579)	(0.422)	(1.8666)	(1.4463)
LA four-index alpha	0.177	-0.422	-0.298	-0.599	-0.475	0.124
	(0.3120)	(-0.7146)	(-0.4517)	(-1.0386)	(-0.7337)	(0.1857)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table D44. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table D59.

Summary of Regressions Using Morningstar Ratings as Predictor: Canadian Periodic Funds

Out-of-sample period	Rating time	Load type	Coefficient has correct negative sign				
			Total (out of 16)	4-star funds (out of 4)	3-star funds (out of 4)	2-star funds (out of 4)	1-star funds (out of 4)
Seven and a half years	Jul-02	LA	5 (1)	0 (0)	0 (0)	1 (0)	4 (1)
		Non LA	5 (1)	0 (0)	0 (0)	1 (0)	4 (1)
Four years	Jul-02	LA	14 (10)	4 (1)	3 (3)	4 (3)	3 (3)
		Non LA	13 (10)	4 (1)	3 (3)	3 (3)	3 (3)
	Jul-03	LA	13 (7)	3 (1)	3 (1)	4 (2)	3 (3)
		Non LA	13 (7)	3 (1)	3 (1)	4 (2)	3 (3)
	Jul-04	LA	3 (0)	0 (0)	0 (0)	3 (0)	0 (0)
		Non LA	3 (0)	0 (0)	0 (0)	3 (0)	0 (0)
	Jul-05	LA	4 (0)	0 (0)	0 (0)	0 (0)	4 (0)
		Non LA	4 (0)	0 (0)	0 (0)	0 (0)	4 (0)
One year	Jul-02	LA	16 (3)	4 (0)	4 (1)	4 (1)	4 (1)
		Non LA	16 (3)	4 (0)	4 (1)	4 (1)	4 (1)
	Jul-03	LA	16 (11)	4 (1)	4 (3)	4 (4)	4 (3)
		Non LA	16 (11)	4 (1)	4 (3)	4 (4)	4 (3)
	Jul-04	LA	9 (5)	0 (0)	1 (1)	4 (2)	4 (2)
		Non LA	9 (5)	0 (0)	1 (1)	4 (2)	4 (2)
	Jul-05	LA	14 (6)	3 (0)	3 (0)	4 (2)	4 (4)
		Non LA	14 (6)	3 (0)	3 (0)	4 (2)	4 (4)
	Jul-06	LA	9 (2)	2 (0)	2 (0)	1 (0)	4 (2)
		Non LA	9 (2)	2 (0)	2 (0)	1 (0)	4 (2)
	Jul-07	LA	8 (2)	0 (0)	2 (0)	4 (2)	2 (0)
		Non LA	8 (2)	0 (0)	2 (0)	4 (2)	2 (0)
	Jul-08	LA	7 (1)	4 (0)	1 (0)	1 (1)	1 (0)
		Non LA	7 (1)	4 (0)	1 (0)	1 (1)	1 (0)

Note. Significant cases are in parentheses. LA = Load-Adjusted

Table D60.

Summary of Tests of Difference in Coefficients: Canadian Periodic Funds

Out-of-sample period	Rating time	Load type	Difference of Coefficient has correct negative sign						
			Total (out of 24)	4-star vs. 3-star (out of 4)	4-star vs. 2-star (out of 4)	4-star vs. 1-star (out of 4)	3-star vs. 2-star (out of 4)	3-star vs. 1-star (out of 4)	2-star vs. 1-star (out of 4)
Seven and a half years	Jul-02	LA	19 (3)	1 (0)	3 (0)	4 (1)	3 (0)	4 (1)	4 (1)
		Non LA	19 (3)	1 (0)	3 (0)	4 (1)	3 (0)	4 (1)	4 (1)
Four years	Jul-02	LA	19 (1)	3 (0)	3 (0)	3 (1)	4 (0)	3 (0)	3 (0)
		Non LA	19 (1)	3 (0)	3 (0)	3 (1)	4 (0)	3 (0)	3 (0)
	Jul-03	LA	19 (6)	3 (0)	4 (1)	3 (2)	4 (1)	3 (2)	2 (0)
		Non LA	19 (6)	3 (0)	4 (1)	3 (2)	4 (1)	3 (2)	2 (0)
	Jul-04	LA	9 (1)	1 (0)	4 (0)	0 (0)	4 (1)	0 (0)	0 (0)
		Non LA	9 (1)	1 (0)	4 (0)	0 (0)	4 (1)	0 (0)	0 (0)
	Jul-05	LA	20 (2)	0 (0)	4 (0)	4 (0)	4 (0)	4 (2)	4 (0)
		Non LA	20 (2)	0 (0)	4 (0)	4 (0)	4 (0)	4 (2)	4 (0)
One year	Jul-02	LA	15 (0)	3 (0)	2 (0)	2 (0)	2 (0)	3 (0)	3 (0)
		Non LA	15 (0)	3 (0)	2 (0)	2 (0)	2 (0)	3 (0)	3 (0)
	Jul-03	LA	19 (4)	4 (2)	4 (1)	3 (1)	3 (0)	2 (0)	3 (0)
		Non LA	18 (4)	4 (2)	4 (1)	3 (1)	2 (0)	2 (0)	3 (0)
	Jul-04	LA	22 (12)	4 (1)	4 (3)	4 (3)	3 (2)	4 (2)	3 (1)
		Non LA	22 (12)	4 (1)	4 (3)	4 (3)	3 (2)	4 (2)	3 (1)
	Jul-05	LA	24 (2)	4 (0)	4 (0)	4 (1)	4 (0)	4 (1)	4 (0)
		Non LA	24 (2)	4 (0)	4 (0)	4 (1)	4 (0)	4 (1)	4 (0)
	Jul-06	LA	15 (5)	2 (0)	0 (0)	4 (1)	1 (0)	4 (1)	4 (3)
		Non LA	15 (5)	2 (0)	0 (0)	4 (1)	1 (0)	4 (1)	4 (3)
	Jul-07	LA	18 (6)	4 (2)	4 (4)	4 (0)	4 (0)	2 (0)	0 (0)
		Non LA	18 (6)	4 (2)	4 (4)	4 (0)	4 (0)	2 (0)	0 (0)
	Jul-08	LA	4 (0)	0 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0 (0)
		Non LA	4 (0)	0 (0)	1 (0)	1 (0)	1 (0)	1 (0)	0 (0)

Note. Significant cases are in parentheses. LA = Load-Adjusted

Table D61

Spearman-Rho Rank Correlation Test Between Morningstar Ratings of July 2002- July 2010 and Four Performance Ratios: U.S. Periodic Funds

Out-of-sample period	Rating period	Out-of-sample performance measure							
		Non LA Sharpe ratio	Non LA information ratio	Non LA Jensen alpha	Non LA four-index alpha	LA Sharpe ratio	LA information ratio	LA Jensen alpha	LA four-index alpha
Nine Years	2002	0.007	-0.033	-0.027	0.019	0.007	-0.033	-0.027	0.018
Four Years	2002	0.063*	-0.019	0.035	0.076*	0.063*	-0.019	0.035	0.076*
	2003	0.041	-0.059*	0.031	0.036	0.041	-0.059*	0.032	0.036
	2004	0.084**	0.074*	0.075**	0.059*	0.084**	0.075*	0.075**	0.059*
	2005	0.067*	0.064*	0.065*	0.060*	0.067*	0.064*	0.065*	0.060*
	2006	-0.002	-0.007	-0.007	0.013	-0.002	-0.007	-0.007	0.013
	2007	0.043	0.042	0.041	0.034	0.043	0.042	0.041	0.034
One Year	2002	0.041	0.035	0.041	0.132**	0.041	0.035	0.041	0.133**
	2003	0.064*	-0.050	0.035	0.063*	0.064*	-0.049	0.035	0.063*
	2004	0.121**	0.116**	0.135**	0.045	0.122**	0.117**	0.135**	0.045
	2005	0.069*	0.065*	0.072**	0.042	0.069*	0.066*	0.073**	0.043
	2006	0.079**	0.061*	0.104**	0.109**	0.079**	0.063*	0.104**	0.110**
	2007	0.140**	0.177**	0.138**	0.015	0.140**	0.116**	0.138**	0.015
	2008	-0.111**	-0.088**	-0.129**	-0.055*	-0.111**	-0.089**	-0.129**	-0.056*
	2009	0.042	-0.037	0.029	0.073**	0.042	-0.036	0.029	0.073**
	2010	0.079**	-0.084**	0.077**	0.061*	0.079**	-0.081**	0.077**	0.061*

Note. * correlation is significant at the 5% level. ** correlation is significant at the 1% level

LA = Load-Adjusted

Table D62

Spearman-Rho Rank Correlation Test Between Morningstar Ratings of July 2002- July 2008 and Four Performance Ratios: Canada Periodic Funds

Out-of-sample period	Ratings period	Out-of-sample performance measure							
		Non LA Sharpe ratio	Non LA information ratio	Non LA Jensen alpha	Non LA four-index alpha	LA Sharpe ratio	LA information ratio	LA Jensen alpha	LA four-index alpha
Seven & a half years	2002	0.062	-0.023	0.078	0.065	0.064	-0.018	0.077	0.063
Four Years	2002	0.189**	-0.025	0.191**	0.190**	0.200**	-0.011	0.192**	0.191**
	2003	0.195**	-0.016	0.268**	0.230**	0.196**	-0.011	0.268**	0.230**
	2004	-0.018	-0.058	0.000	0.028	-0.018	-0.058	0.000	0.028
	2005	0.050	0.051	0.054	0.057	0.050	0.051	0.053	0.057
One Year	2002	0.001	0.074	0.021	0.159*	0.001	0.060	0.022	0.159*
	2003	0.253**	0.103	0.284**	0.137*	0.253**	0.104	0.284**	0.137*
	2004	0.158**	0.114*	0.164**	0.174**	0.158**	0.115*	0.164**	0.175**
	2005	0.118*	0.092	0.114*	0.079	0.117*	0.092	0.114*	0.079
	2006	-0.015	0.034	-0.068	-0.167**	-0.014	0.034	-0.068	-0.166**
	2007	0.224**	0.227**	0.196**	0.167**	0.224**	0.227**	0.196**	0.167**
	2008	-0.234**	-0.151**	-0.230**	0.151**	-0.235**	-0.150**	-0.230**	0.151**

Note. * correlation is significant at the 5% level.** correlation is significant at the 1% level.

LA = Load-Adjusted

Appendix-E

Comparison of Morningstar Ratings and Alternative Ratings: U.S. Complete Funds

Table E1.

Regression Analysis Using Morningstar Star as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Nine years	0.107* (27.532)	-0.005 (-1.072)	-0.009* (-1.956)	-0.000 (-0.073)	-0.006 (-0.764)	1.636	0.003
LA Sharpe ratio-Four years	0.206* (27.186)	-0.019* (-2.109)	-0.029* (-3.262)	-0.018* (-1.827)	-0.026* (-1.738)	2.768*	0.009
LA Sharpe ratio-One year	0.055* (5.613)	-0.054* (-4.579)	-0.051* (-4.465)	-0.044* (-3.457)	-0.042* (-2.200)	5.981*	0.025
LA information ratio-Nine years	0.039* (9.010)	-0.006 (-1.167)	-0.007** (-1.482)	0.004 (0.703)	0.001 (0.092)	2.132**	0.006
LA information ratio-Four years	0.065* (7.816)	-0.020* (-1.945)	-0.020* (-2.081)	-0.002 (-0.184)	-0.002 (-0.093)	2.283**	0.007
LA information ratio- One year	0.044* (4.524)	-0.054* (-4.542)	-0.050* (-4.359)	-0.042* (-3.337)	-0.040* (-2.078)	5.808*	0.024
LA Jensen alpha -Nine years	0.200* (8.131)	-0.024 (-0.798)	-0.037** (-1.291)	0.034 (1.064)	0.010 (0.199)	2.263**	0.007
LA Jensen alpha -Four years	0.325* (7.853)	-0.080** (-1.599)	-0.105* (-2.191)	-0.024 (-0.443)	-0.085 (-1.038)	1.738	0.004
LA Jensen alpha -One year	0.254* (4.123)	-0.273* (-3.673)	-0.246* (-3.440)	-0.187* (-2.353)	-0.114 (-0.939)	3.979*	0.015
LA four-index alpha -Nine years	0.081* (3.517)	-0.013 (-0.473)	-0.042** (-1.553)	0.022 (0.748)	-0.029 (-0.645)	2.058**	0.005
LA for-index alpha -Four years	0.090* (2.974)	-0.063* (-1.706)	-0.096* (-2.706)	-0.053** (-1.334)	-0.107* (-1.788)	2.091**	0.006
LA four-index alpha -One year	0.308* (4.895)	-0.308* (-4.055)	-0.324* (-4.430)	-0.316* (-3.884)	-0.349* (-2.818)	5.637*	0.024

Note. Sample size of 768 funds from July 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E2.

Regression Analysis Using Sharpe Ratio Ranking as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Nine years	0.110* (28.943)	-0.001** (-0.158)	-0.007** (-1.475)	-0.021* (-4.210)	-0.032* (-4.208)	10.65*	0.048
LA Sharpe ratio-Four years	0.244* (34.576)	-0.041* (-4.824)	-0.068* (-8.321)	-0.090* (-9.911)	-0.105* (7.593)	33.28*	0.144
LA Sharpe ratio- One year	0.050* (5.091)	-0.037* (-3.090)	-0.046* (-4.023)	-0.050* (-3.957)	-0.052* (-2.677)	4.961*	0.020
LA information ratio-Nine year	0.049* (11.864)	-0.005 (-1.082)	-0.014* (-2.813)	-0.030* (-5.639)	-0.045* (-5.496)	15.68*	0.071
LA information ratio-Four year	0.112* (14.486)	-0.040* (-4.247)	-0.070* (-7.766)	-0.097* (-9.679)	-0.122* (-8.002)	33.90*	0.146
LA information ratio- One year	0.039* (3.958)	-0.035* (-2.966)	-0.044* (-3.882)	-0.048* (-3.815)	-0.050* (-2.596)	4.626*	0.019
LA Jensen alpha -Nine years	0.271* (11.326)	-0.041** (-1.405)	-0.082* (-2.958)	-0.171* (-5.517)	-0.241* (-5.109)	13.47*	0.061
LA Jensen alpha -Four years	0.561* (14.611)	-0.214* (-4.616)	-0.350* (-7.840)	-0.491* (-9.886)	-0.577* (-7.634)	32.86*	0.142
LA Jensen alpha -One year	0.179* (2.886)	-0.133* (-1.771)	-0.159* (-2.206)	-0.139* (-1.739)	-0.219* (-1.792)	1.443	0.002
LA four-index alpha -Nine years	0.074* (3.205)	0.017 (0.617)	-0.005 (-0.195)	-0.045** (-1.506)	-0.067** (-1.479)	2.207**	0.006
LA four-index alpha -Four years	0.184* (6.206)	-0.130* (-3.620)	-0.200* (-5.774)	-0.227* (-5.904)	-0.214* (-3.649)	11.22*	0.051
LA four-index alpha -One year	0.296* (4.724)	-0.235* (-3.091)	-0.323* (-4.432)	-0.359* (-4.416)	-0.375* (-3.029)	6.287*	0.027

Note. Sample size of 768 funds from July 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E3.

Regression Analysis Using Information Ratio Ranking as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Nine years	0.113* (29.587)	-0.002 (-0.427)	-0.016* (-3.496)	-0.022* (-4.359)	-0.013* (-1.681)	8.929*	0.040
LA Sharpe ratio-Four years	0.250* (35.882)	-0.047* (-5.521)	-0.082* (-10.130)	-0.096* (-10.593)	-0.086* (-6.253)	37.70*	0.161
LA Sharpe ratio-One year	0.045* (4.589)	-0.024* (-2.034)	-0.053* (-4.667)	-0.038* (-3.050)	-0.006 (-0.318)	7.064*	0.031
LA information ratio-Nine years	0.053* (12.823)	-0.007** (-1.320)	-0.025* (-5.135)	-0.033* (-6.191)	-0.023* (-2.777)	15.77*	0.072
LA information ratio-Four years	0.121* (15.942)	-0.046* (-5.022)	-0.090* (-10.168)	-0.106* (-10.800)	-0.088* (-5.871)	40.27*	0.170
LA information ratio- One year	0.034* (3.459)	-0.023* (-1.909)	-0.051* (-4.540)	-0.037* (-2.921)	-0.004 (-0.229)	6.827*	0.029
LA Jensen alpha -Nine years	0.291* (12.122)	-0.052* (-1.789)	-0.138* (-4.962)	-0.181* (-5.819)	-0.144* (-2.422)	12.51*	0.057
LA Jensen alpha -Four years	0.599* (15.736)	-0.241* (-5.243)	-0.431* (-9.758)	-0.520* (-10.568)	-0.467* (-6.225)	37.01*	0.158
LA Jensen alpha -One year	0.123* (2.003)	-0.035 (-0.469)	-0.179* (-2.514)	-0.060 (-0.760)	0.265 (2.192)	5.35*	0.022
LA four-index alpha -Nine years	0.079* (3.404)	0.005 (0.167)	-0.024 (-0.875)	-0.037 (-1.233)	0.018 (0.391)	1.092	0.000
LA four-index alpha -Four years	0.181* (6.080)	-0.132* (-3.664)	-0.213* (-6.152)	-0.195* (-5.055)	-0.153* (-2.608)	10.44*	0.047
LA four-index alpha -One year	0.251* (4.045)	-0.121** (-1.609)	-0.363* (-5.027)	-0.299* (-3.718)	0.007 (0.061)	10.04*	0.045

Note. Sample size of 768 funds from July 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E4.

Regression Analysis Using Jensen Alpha Ranking as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Nine years	0.114* (29.94)	-0.001 (-0.289)	-0.016* (-3.627)	-0.024* (-4.969)	-0.014* (-1.913)	11.51*	0.052
LA Sharpe ratio-Four years	0.200* (27.383)	0.017 (1.888)	-0.026* (-3.067)	-0.042* (-4.413)	-0.030* (-2.060)	18.12*	0.082
LA Sharpe ratio-One year	0.047* (4.786)	-0.026* (-2.190)	-0.049* (-4.364)	-0.052* (-4.102)	-0.010 (-0.501)	6.948*	0.030
LA information ratio-Nine years	0.054* (13.171)	-0.003 (-0.645)	-0.025* (-5.341)	-0.039* (-7.411)	-0.023* (-2.934)	24.36*	0.109
LA information ratio-Four years	0.085* (10.98)	0.006 (0.695)	-0.050* (-5.611)	-0.076* (-7.613)	-0.045* (-2.929)	34.03*	0.147
LA information ratio- One year	0.038* (3.862)	-0.027* (-2.260)	-0.050* (-4.434)	-0.053* (-4.176)	-0.010 (-0.510)	7.139*	0.031
LA Jensen alpha -Nine years	0.275* (11.627)	-0.010 (-0.340)	-0.123* (-4.486)	-0.191* (-6.230)	-0.105* (-2.242)	17.99*	0.081
LA Jensen alpha -Four years	0.363* (9.221)	0.068 (1.436)	-0.175* (-3.828)	-0.278* (-5.457)	-0.207* (-2.668)	22.26*	0.100
LA Jensen alpha -One year	0.246* (4.032)	-0.174* (-2.363)	-0.267* (-3.768)	-0.308* (-3.905)	0.133 (1.108)	7.397*	0.032
LA four-index alpha -Nine years	0.062* (2.684)	0.019 (0.679)	0.001 (0.020)	-0.019 (-0.619)	0.027 (0.596)	0.686	-0.002
LA four-index alpha -Four years	0.023 (0.776)	0.068 (1.848)	-0.026 (-0.736)	-0.047 (-1.196)	-0.004 (-0.070)	4.111*	0.016
LA four-index alpha -One year	0.060 (0.951)	0.020 (0.266)	-0.082 (-1.110)	-0.092 (-1.126)	0.253 (2.026)	2.961*	0.010

Note. Sample size of 768 funds from July 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.

Table E5.

Regression Analysis Using Four-Index Alpha Ranking as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Nine years	0.117* (30.531)	-0.012* (-2.591)	-0.022* (-4.851)	-0.019* (-3.746)	-0.006 (-0.814)	7.06*	0.031
LA Sharpe ratio-Four years	0.177* (23.238)	0.008 (0.922)	0.008 (0.847)	0.013 (1.361)	0.027 (1.814)	0.998	0.000
LA Sharpe ratio- One year	0.065* (6.885)	-0.034* (-2.957)	-0.071* (-6.395)	-0.077* (-6.258)	-0.102* (-5.431)	17.00*	0.077
LA information ratio-Nine years	0.058* (13.952)	-0.019* (-3.727)	-0.032* (-6.567)	-0.030* (-5.574)	-0.017* (-2.053)	12.60*	0.057
LA information ratio-Four years	0.070* (8.397)	-0.014 (-1.408)	-0.028* (-2.856)	-0.021* (-1.962)	-0.00002 (-0.001)	2.69*	0.009
LA information ratio- One year	0.057* (6.049)	-0.036* (-3.101)	-0.073* (-6.596)	-0.079* (-6.423)	-0.104* (-5.542)	17.77*	0.080
LA Jensen alpha -Nine years	0.301* (12.428)	-0.104* (-3.553)	-0.152* (-5.414)	-0.146* (-4.654)	-0.053 (-1.110)	8.614*	0.038
LA Jensen alpha -Four years	0.240* (5.782)	0.009 (0.181)	0.008 (0.175)	0.022 (0.417)	0.155 (1.900)	1.062	0.000
LA Jensen alpha -One year	0.471* (8.016)	-0.316* (-4.448)	-0.541* (-7.916)	-0.567* (-7.443)	-0.725* (-6.258)	22.08*	0.099
LA four-index alpha -Nine years	0.087* (3.757)	-0.037** (-1.333)	-0.031 (-1.166)	-0.012 (-0.391)	0.053 (1.164)	1.563	0.003
LA four-index alpha -Four years	0.018 (0.575)	0.014 (0.368)	0.016 (0.448)	-0.011 (-0.281)	-0.029 (-0.485)	0.349	-0.003
LA four-index alpha -One year	0.016 (0.255)	0.023 (0.293)	0.012 (0.160)	0.025 (0.300)	-0.035 (-0.281)	0.085	-0.005

Note. Sample size of 768 funds from July 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E6.

Tests of Differences in Coefficients: Morningstar's New Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- nine years	-0.004 (-0.5657)	0.005 (0.7071)	-0.001 (-0.106)	0.009 (1.2728)	0.003 (0.318)	-0.006 (-0.636)
LA Sharpe ratio- four years	-0.01 (-0.7857)	0.001 (0.0743)	-0.007 (-0.4002)	0.011 (0.8176)	0.003 (0.1715)	-0.008 (-0.4438)
LA Sharpe ratio- one year	0.003 (0.1843)	0.01 (0.5652)	0.012 (0.5339)	0.007 (0.4111)	0.009 (0.4099)	0.002 (0.0869)
LA information ratio- nine years	-0.001 (-0.1414)	0.01 (1.2803)	0.007 (0.742)	0.011 (1.4084)	0.008 (0.848)	-0.003 (-0.3)
LA information ratio- four years	0 (0)	0.018 (1.2108)	0.018 (0.954)	0.018 (1.2108)	0.018 (0.954)	0 (0)
LA information ratio- one year	0.004 (0.2457)	0.012 (0.6783)	0.014 (0.6229)	0.008 (0.4698)	0.01 (0.4555)	0.002 (0.0869)
LA Jensen alpha- nine years	-0.013 (-0.3116)	0.058 (1.3223)	0.034 (0.5918)	0.071 (1.6441)	0.047 (0.8255)	-0.024 (-0.4101)
LA Jensen alpha- four years	-0.025 (-0.3607)	0.056 (0.7609)	-0.005 (-0.0521)	0.081 (1.1211)	0.02 (0.2105)	-0.061 (-0.6213)
LA Jensen alpha- one years	0.027 (0.2633)	0.086 (0.7892)	0.159 (1.1210)	0.059 (0.5516)	0.132 (0.9409)	0.073 (0.5033)
LA four-index alpha- nine years	-0.029 (-0.7456)	0.035 (0.8529)	-0.016 (-0.2971)	0.064 (1.5857)	0.013 (0.2437)	-0.051 (-0.9287)
LA four-index alpha- four years	-0.033 (-0.6479)	0.01 (0.186)	-0.044 (-0.6242)	0.043 (0.8206)	-0.011 (-0.1584)	-0.054 (-0.7546)
LA four-index alpha- one year	-0.016 (-0.1518)	-0.008 (-0.0720)	-0.041 (-0.2819)	0.008 (0.0734)	-0.025 (-0.1737)	-0.033 (-0.2228)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E1. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

Table E7.

Tests of Differences in Coefficients: Sharpe Ratio Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- nine years	-0.006 (-0.937)	-0.02* (-2.8284)	-0.031* (-3.6037)	-0.014* (-2.1864)	-0.025* (-3.1009)	-0.011 (-1.2787)
LA Sharpe ratio- four years	-0.027* (-2.2422)	-0.049* (-3.8498)	-0.064* (-3.8454)	-0.022* (-1.827)	-0.037* (-2.2946)	-0.015 (-0.9013)
LA Sharpe ratio- one year	-0.009 (-0.5529)	-0.013 (-0.7348)	-0.015 (-0.6675)	-0.004 (-0.2349)	-0.006 (-0.2733)	-0.002 (-0.0869)
LA information ratio- nine years	-0.009 (-1.2728)	-0.025* (-3.5355)	-0.04* (-4.24)	-0.016* (-2.2627)	-0.031* (-3.2886)	-0.015* (-1.59)
LA information ratio- four years	-0.03* (-2.357)	-0.057* (-4.2368)	-0.082* (-4.6876)	-0.027* (-2.0069)	-0.052* (-2.9726)	-0.025** (-1.3868)
LA information ratio- one year	-0.009 (-0.5529)	-0.013 (-0.7348)	-0.015 (-0.6675)	-0.004 (-0.2349)	-0.006 (-0.2733)	-0.002 (-0.0869)
LA Jensen alpha- nine years	-0.041 (-1.0171)	-0.13* (-3.0624)	-0.2* (-3.6214)	-0.089* (-2.1306)	-0.159* (-2.9063)	-0.07 (-1.2433)
LA Jensen alpha- four years	-0.136* (-2.1134)	-0.277* (-4.0771)	-0.363* (-4.0861)	-0.141* (-2.0961)	-0.227* (-2.5701)	-0.086 (-0.9453)
LA Jensen alpha- one years	-0.026 (-0.2501)	-0.006 (-0.0547)	-0.086 (-0.6005)	0.02 (0.1858)	-0.06 (-0.4235)	-0.08 (-0.5484)
LA four-index alpha- nine years	-0.022 (-0.5656)	-0.062** (-1.5108)	-0.084** (-1.5598)	-0.04 (-0.9911)	-0.062 (-1.1624)	-0.022 (-0.4006)
LA four-index alpha- four years	-0.07** (-1.3942)	-0.097* (-1.8531)	-0.084 (-1.2154)	-0.027 (-0.5226)	-0.014 (-0.2041)	0.013 (0.1852)
LA four-index alpha- one year	-0.088 (-0.8351)	-0.124 (-1.1164)	-0.14 (-0.9626)	-0.036 (-0.3302)	-0.052 (-0.3614)	-0.016 (-0.108)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E2. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E8.

Tests of Differences in Coefficients: Information Ratio Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- nine years	-0.014* (-2.1864)	-0.02* (-2.8284)	-0.011 (-1.166)	-0.006 (-0.937)	0.003 (0.3354)	0.009 (0.954)
LA Sharpe ratio- four years	-0.035* (-3.0936)	-0.049* (-4.0692)	-0.039* (-2.4187)	-0.014 (-1.1626)	-0.004 (-0.2481)	0.01 (0.6008)
LA Sharpe ratio- one year	-0.029* (-1.7815)	-0.014 (-0.7913)	0.018 (0.8009)	0.015 (0.8808)	0.047 (2.1408)	0.032 (1.39)
LA information ratio- nine years	-0.018* (-2.5456)	-0.026* (-3.677)	-0.016* (-1.696)	-0.008 (-1.1314)	0.002 (0.212)	0.01 (1.06)
LA information ratio- four years	-0.044* (-3.457)	-0.06* (-4.4598)	-0.042* (-2.401)	-0.016 (-1.1893)	0.002 (0.1143)	0.018 (0.9985)
LA information ratio- one year	-0.028* (-1.72)	-0.014 (-0.7913)	0.019 (0.8455)	0.014 (0.8221)	0.047 (2.1408)	0.033 (1.4334)
LA Jensen alpha- nine years	-0.086* (-2.1334)	-0.129* (-3.0389)	-0.062 (-1.1226)	-0.043 (-1.0294)	0.024 (0.4387)	0.067 (1.19)
LA Jensen alpha- four years	-0.19* (-2.9848)	-0.279* (-4.1513)	-0.226* (-2.5687)	-0.089** (-1.3514)	-0.036 (-0.414)	0.053 (0.5916)
LA Jensen alpha- one years	-0.144** (-1.4042)	-0.025 (-0.231)	0.3 (2.1152)	0.119 (1.1204)	0.444 (3.1648)	0.325 (2.2490)
LA four-index alpha- nine years	-0.029 (-0.7456)	-0.042 (-1.0235)	0.013 (0.2414)	-0.013 (-0.3221)	0.042 (0.7874)	0.055 (1.0015)
LA four-index alpha- four years	-0.081** (-1.6132)	-0.063 (-1.187)	-0.021 (-0.3038)	0.018 (0.3435)	0.06 (0.8746)	0.042 (0.5939)
LA four-index alpha- one year	-0.242* (-2.3277)	-0.178** (-1.6232)	0.128 (0.8938)	0.064 (0.5946)	0.37 (2.6119)	0.306 (2.0975)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E3. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E9.

Tests of Differences in Coefficients: Jensen Alpha Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- nine years	-0.015* (-2.3426)	-0.023* (-3.2527)	-0.013** (-1.5112)	-0.008 (-1.2494)	0.002 (0.2481)	0.01 (1.1625)
LA Sharpe ratio- four years	-0.043* (-3.571)	-0.059* (-4.6355)	-0.047* (-2.824)	-0.016** (-1.3287)	-0.004 (-0.2481)	0.012 (0.7210)
LA Sharpe ratio- one year	-0.023** (-1.4129)	-0.026** (-1.4696)	0.016 (0.7119)	-0.003 (-0.1762)	0.039 (1.7764)	0.042 (1.8244)
LA information ratio- nine years	-0.022* (-3.1113)	-0.036* (-5.0912)	-0.02* (-2.12)	-0.014* (-1.9799)	0.002 (0.212)	0.016 (1.696)
LA information ratio- four years	-0.056* (-4.3998)	-0.082* (-6.095)	-0.051* (-2.9155)	-0.026* (-1.9326)	0.005 (0.2853)	0.031 (1.7196)
LA information ratio- one year	-0.023** (-1.4129)	-0.026** (-1.4696)	0.017 (0.7565)	-0.003 (-0.1762)	0.04 (1.8219)	0.043 (1.8678)
LA Jensen alpha- nine years	-0.113* (-2.8032)	-0.181* (-4.2638)	-0.095* (-1.7202)	-0.068** (-1.6278)	0.018 (0.3290)	0.086 (1.5275)
LA Jensen alpha- four years	-0.243* (-3.6551)	-0.346* (-4.9403)	-0.275* (-3.0308)	-0.103** (-1.4997)	-0.032 (-0.3568)	0.071 (0.7687)
LA Jensen alpha- one years	-0.093 (-0.9069)	-0.134 (-1.2379)	0.307 (2.1776)	-0.041 (0.386)	0.4 (2.8688)	0.441 (3.0695)
LA four-index alpha- nine years	-0.018 (-0.4628)	-0.038 (-0.926)	0.008 (0.1486)	-0.02 (-0.4955)	0.026 (0.4875)	0.046 (0.8376)
LA four-index alpha- four years	-0.094* (-1.8456)	-0.115* (-2.1392)	-0.072 (-1.0214)	-0.021 (-0.4007)	0.022 (0.3167)	0.043 (0.6009)
LA four-index alpha- one year	-0.102 (-0.9551)	-0.112 (-0.9957)	0.233 (1.5871)	-0.01 (-0.0905)	0.335 (2.3062)	0.345 (2.3078)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E4. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E10.

Tests of Differences in Coefficients: Four-Index Alpha Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- nine years	-0.01** (-1.5617)	-0.007 (-0.9899)	0.006 (0.636)	0.003 (0.4685)	0.016 (1.7888)	0.013 (1.378)
LA Sharpe ratio- four years	0 (0)	0.005 (0.3717)	0.019 (1.0862)	0.005 (0.3716)	0.019 (1.0862)	0.014 (0.7766)
LA Sharpe ratio- one year	-0.037* (-2.3785)	-0.043* (-2.6415)	-0.068* (-3.0973)	-0.006 (-0.3686)	-0.031** (-1.412)	-0.025 (-1.1125)
LA information ratio- nine years	-0.013* (-1.8385)	-0.011** (-1.5556)	0.002 (0.212)	0.002 (0.2828)	0.015 (1.59)	0.013 (1.378)
LA information ratio- four years	-0.014 (-0.9899)	-0.007 (-0.4709)	0.0139 (0.7409)	0.007 (0.4709)	0.0279 (1.4829)	0.0209 (1.0805)
LA information ratio- one year	-0.037* (-2.3785)	-0.043* (-2.6415)	-0.068* (-3.0973)	-0.006 (-0.3686)	-0.031** (-1.412)	-0.025 (-1.1125)
LA Jensen alpha- nine years	-0.048 (-1.1907)	-0.042 (-0.9894)	0.051 (0.9094)	0.006 (0.1436)	0.099 (1.7815)	0.093 (1.6276)
LA Jensen alpha- four years	-0.001 (-0.0144)	0.013 (0.1767)	0.146 (1.5202)	0.014 (0.1936)	0.147 (1.5471)	0.133 (1.3546)
LA Jensen alpha- one years	-0.225* (-2.2887)	-0.251* (-2.4133)	-0.409* (-3.0073)	-0.026 (-0.255)	-0.184** (-1.3684)	-0.158 (-1.1393)
LA four-index alpha- nine years	0.006 (0.1543)	0.025 (0.6092)	0.09 (1.6713)	0.019 (0.4708)	0.084 (1.5749)	0.065 (1.1836)
LA four-index alpha- four years	0.002 (0.0387)	-0.025 (-0.4588)	-0.043 (-0.61)	-0.027 (-0.5017)	-0.045 (-0.6431)	-0.018 (-0.2496)
LA four-index alpha- one year	-0.011 (-0.103)	0.002 (0.0177)	-0.058 (-0.3928)	0.013 (0.1169)	-0.047 (-0.3216)	-0.06 (-0.3977)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E5. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Comparison of Morningstar Ratings and Alternative Ratings: Canadian Complete Funds

Table E11.

Regression Analysis Using Morningstar Star as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Seven and a half years	0.097* (9.580)	0.003 (0.244)	0.005 (0.396)	0.000 (0.012)	-0.032 (-1.236)	0.566	-0.010
LA Sharpe ratio-Four years	0.281* (15.714)	-0.033** (-1.429)	-0.036** (-1.571)	-0.060* (-2.357)	-0.099* (-2.174)	2.023**	0.023
LA Sharpe ratio- One year	-0.102* (-4.482)	-0.018 (-0.605)	-0.020 (-0.677)	-0.010 (-0.306)	-0.000 (-0.005)	0.150	-0.020
LA information ratio-Seven and a half years	-0.010 (-0.860)	0.009 (0.614)	0.014 (0.987)	0.014 (0.876)	-0.000 (-0.004)	0.320	-0.016
LA information ratio-Four years	-0.010 (-0.509)	-0.005 (-0.174)	0.010 (0.386)	-0.002 (-0.064)	0.012 (0.232)	0.124	-0.020
LA information ratio- One year	0.012 (0.544)	-0.031 (-1.100)	-0.038** (-1.329)	-0.039 (-1.221)	-0.050 (-0.873)	0.575	-0.010
LA Jensen alpha -Seven and a half years	0.051 (1.00)	0.021 (0.320)	0.012 (0.183)	-0.004 (-0.050)	-0.136 (-1.051)	0.406	-0.014
LA Jensen alpha -Four years	0.217* (2.831)	-0.117 (-1.194)	-0.168* (-1.707)	-0.235* (-2.167)	-0.353* (-1.802)	1.650	0.015
LA Jensen alpha -One year	-0.045 (-0.527)	-0.105 (-0.955)	-0.073 (-0.663)	-0.033 (-0.271)	-0.097 (-0.440)	0.269	-0.017
LA four-index alpha -Seven and a half years	0.005 (0.121)	0.041 (0.763)	0.044 (0.822)	0.019 (0.324)	-0.149** (-1.388)	1.008	0.000
LA four-index alpha -Four years	0.121* (2.249)	-0.083 (-1.208)	-0.094** (-1.357)	-0.183* (-2.403)	-0.272* (-1.976)	1.951	0.021
LA four-index alpha -One year	0.059 (0.635)	-0.103 (-0.870)	-0.152 (-1.275)	-0.186** (-1.403)	-0.370** (-1.561)	0.924	-0.002

Note. Sample size of 176 funds from July 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E12.

Regression Analysis Using Sharpe Ratio Ranking as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Seven and a half years	0.106* (10.896)	0.014 (1.112)	-0.013 (-1.053)	-0.035* (-2.526)	-0.031 (-1.258)	4.403*	0.072
LA Sharpe ratio-Four years	0.306* (18.847)	-0.027** (-1.304)	-0.073* (-3.504)	-0.138* (-5.997)	-0.123* (-2.982)	11.69*	0.196
LA Sharpe ratio-One year	-0.063* (-2.838)	-0.078* (-2.742)	-0.056* (-1.982)	-0.070* (-2.232)	0.003 (0.046)	2.358**	0.030
LA information ratio-Seven and a half years	0.001 (0.135)	0.014 (0.994)	-0.004 (-0.294)	-0.022** (-1.437)	-0.014 (-0.489)	1.761	0.017
LA information ratio-Four years	0.016 (0.785)	-0.005 (-0.189)	-0.025 (-0.989)	-0.071* (-2.518)	-0.063 (-1.247)	2.294**	0.029
LA information ratio- One year	0.047* (2.165)	-0.077* (-2.771)	-0.075* (-2.698)	-0.101* (-3.282)	-0.049 (-0.889)	3.143*	0.047
LA Jensen alpha -Seven and a half years	0.093* (1.893)	0.064 (1.030)	-0.076 (-1.210)	-0.144* (-2.078)	-0.210* (-1.685)	3.84*	0.061
LA Jensen alpha -Four years	0.285* (3.978)	-0.083 (-0.901)	-0.254* (-2.767)	-0.499* (-4.919)	-0.450* (-2.464)	8.10*	0.140
LA Jensen alpha -One year	0.042 (0.496)	-0.230* (-2.140)	-0.155** (-1.446)	-0.231* (-1.943)	0.207 (0.968)	2.21**	0.027
LA four-index alpha -Seven and a half years	0.026 (0.626)	0.093 (1.771)	-0.032 (-0.609)	-0.056 (-0.960)	-0.131 (-1.253)	3.18*	0.047
LA four-index alpha -Four years	0.147* (2.865)	-0.034 (-0.510)	-0.155* (-2.364)	-0.320* (-4.405)	-0.176** (-1.340)	6.51*	0.112
LA four-index alpha -One year	0.179* (1.999)	-0.214* (-1.869)	-0.263* (-2.294)	-0.502* (-3.961)	-0.249 (-1.090)	3.99*	0.064

Note. Sample size of 176 funds from July 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E13.

Regression Analysis Using Information Ratio Ranking as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Seven and a half years	0.110* (11.376)	0.007 (0.534)	-0.013 (-1.015)	-0.046* (-3.367)	-0.027 (-1.087)	5.04*	0.085
LA Sharpe ratio-Four years	0.311* (19.348)	-0.036* (-1.733)	-0.077* (-3.725)	-0.146* (-6.438)	-0.125* (-3.052)	12.65*	0.210
LA Sharpe ratio-One year	-0.063* (-2.884)	-0.088* (-3.133)	-0.038** (-1.343)	-0.078* (-2.509)	-0.010 (-0.174)	3.142*	0.047
LA information ratio-Seven and half year	0.007 (0.011)	0.006 (0.402)	-0.005 (-0.391)	-0.037* (-2.380)	-0.006 (-0.218)	2.493*	0.033
LA information ratio-Four year	0.025 (1.257)	-0.014 (-0.569)	-0.032** (-1.301)	-0.095* (-3.431)	-0.048 (-0.957)	3.604*	0.056
LA information ratio- One year	0.049* (2.257)	-0.091* (-3.288)	-0.060* (-2.176)	-0.108* (-3.537)	-0.069 (-1.247)	3.828*	0.061
LA Jensen alpha -Seven and a half years	0.127* (2.609)	0.014 (0.227)	-0.089** (-1.432)	-0.227* (-3.309)	-0.197** (-1.591)	4.69*	0.078
LA Jensen alpha -Four years	0.321* (4.543)	-0.125** (-1.383)	-0.297* (-3.281)	-0.553* (-5.530)	-0.468* (-2.594)	9.539*	0.163
LA Jensen alpha -One year	0.050 (0.593)	-0.286* (-2.676)	-0.108 (-1.013)	-0.241* (-2.039)	0.110 (0.515)	2.669*	0.037
LA four-index alpha -Seven and a half years	0.052 (1.253)	0.043 (0.814)	-0.024 (-0.457)	-0.123* (-2.116)	-0.153** (-1.460)	3.023*	0.044
LA four-index alpha -Four years	0.172* (3.363)	-0.080 (-1.223)	-0.162* (-2.486)	-0.352* (-4.875)	-0.258* (-1.977)	7.031*	0.121
LA four-index alpha -One year	0.185* (2.077)	-0.247* (-2.164)	-0.230* (-2.017)	-0.533* (-4.223)	-0.263 (-1.156)	4.497*	0.074

Note. Sample size of 176 funds from July 2002. *t*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E14.

Regression Analysis Using Jensen Alpha Ranking as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Seven and a half years	0.118* (12.213)	-0.006 (-0.528)	-0.017** (-1.403)	-0.056* (-4.084)	-0.041* (-1.666)	5.49*	0.093
LA Sharpe ratio-Four years	0.305* (18.792)	-0.033** (-1.578)	-0.059* (-2.862)	-0.138* (-6.033)	-0.151* (-3.660)	11.80*	0.198
LA Sharpe ratio-One year	-0.068* (-3.111)	-0.074* (-2.613)	-0.039** (-1.370)	-0.079* (-2.534)	0.031 (0.554)	2.87*	0.041
LA information ratio-Seven and a half years	0.025* (2.317)	-0.020** (-1.456)	-0.025* (-1.834)	-0.058* (-3.835)	-0.026 (-0.948)	3.84*	0.061
LA information ratio-Four years	0.061* (3.237)	-0.067* (-2.752)	-0.075* (-3.085)	-0.135* (-5.053)	-0.082* (-1.707)	6.45*	0.111
LA information ratio- One year	0.028 (1.278)	-0.059* (-2.092)	-0.037** (-1.338)	-0.095* (-3.079)	-0.006 (-0.110)	2.71*	0.038
LA Jensen alpha -Seven and a half years	0.186* (3.871)	-0.080** (-1.303)	-0.143* (-2.324)	-0.297* (-4.365)	-0.273* (-2.231)	5.693*	0.097
LA Jensen alpha -Four years	0.354* (5.030)	-0.196* (-2.176)	-0.302* (-3.364)	-0.567* (-5.705)	-0.678* (3.785)	10.20*	0.174
LA Jensen alpha -One year	0.021 (0.249)	-0.218* (-2.031)	-0.099 (-0.923)	-0.235* (-1.980)	0.244 (1.140)	2.379**	0.031
LA four-index alpha -Seven and a half years	0.094* (2.301)	-0.029 (-0.562)	-0.056 (-1.061)	-0.187* (-3.217)	-0.158** (-1.513)	3.38*	0.052
LA four-index alpha -Four years	0.191* (3.753)	-0.134* (-2.066)	-0.149* (-2.298)	-0.374* (-5.195)	-0.339* (-2.615)	7.55*	0.130
LA four-index alpha -One year	0.119** (1.320)	-0.131 (-1.139)	-0.170** (-1.477)	-0.444* (-3.480)	-0.326** (-1.415)	3.37*	0.051

Note. Sample size of 176 funds from July 2002. *t*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E15.

Regression Analysis Using Four-Index Alpha Ranking as Predictor: July 2002

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio-Seven and a half years	0.093* (9.177)	0.003 (0.207)	0.016 (1.255)	-0.003 (-0.198)	0.020 (0.778)	0.810	-0.004
LA Sharpe ratio-Four years	0.254* (14.156)	-0.008 (-0.337)	0.014 (0.591)	-0.047* (-1.852)	-0.015 (-0.322)	1.81	0.018
LA Sharpe ratio-One year	-0.087* (-3.906)	-0.032 (-1.110)	-0.024 (-0.841)	-0.069* (-2.174)	0.035 (0.612)	1.61	0.014
LA Information ratio-Seven and half year	-0.003 (-0.269)	-0.010 (-0.685)	0.010 (0.702)	0.007 (0.444)	0.039 (1.393)	1.21	0.005
LA Information ratio-Four year	0.002 (0.102)	-0.044* (-1.722)	0.009 (0.350)	-0.011 (-0.373)	0.047 (0.933)	1.93	0.021
LA Information ratio- One year	0.008 (0.386)	-0.020 (-0.727)	-0.020 (-0.700)	-0.083* (-2.653)	0.012 (0.210)	2.19**	0.026
LA. Jensen alpha -Seven and a half years	0.051 (0.996)	-0.036 (-0.556)	0.045 (0.697)	0.002 (0.021)	0.048 (0.368)	0.541	-0.011
LA Jensen alpha -Four years	0.116** (1.502)	-0.073 (-0.735)	0.032 (0.325)	-0.147** (-1.345)	0.012 (0.061)	0.980	0.000
LA Jensen alpha -One year	-0.048 (-0.571)	-0.053 (-0.490)	-0.053 (-0.486)	-0.198* (-1.652)	0.247 (1.143)	1.39	0.009
LA 4 Index alpha -Seven and half year	0.016 (0.373)	0.007 (0.137)	0.052 (0.960)	-0.016 (-0.260)	-0.046 (-0.424)	0.565	-0.010
LA 4 Index alpha -Four year	0.051 (0.944)	-0.008 (-0.124)	0.039 (0.574)	-0.173* (-2.284)	-0.053 (-0.387)	2.581*	0.035
LA 4 Index alpha -One year	-0.053 (-0.572)	0.011 (0.092)	0.027 (0.224)	-0.169** (-1.290)	0.264 (1.120)	1.220	0.005

Note. Sample size of 176 funds from July 2002. *t*-statistics are in the parentheses. LA = Load Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E16.

Tests of Differences in Coefficients: Morningstar's New Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- seven-and-a-half-years	0.002 (0.1088)	-0.003 (-0.1570)	-0.035 (-1.204)	-0.005 (-0.2617)	-0.037 (-1.2728)	-0.032 (-1.0837)
LA Sharpe ratio- four years	-0.003 (-0.0922)	-0.027 (-0.7948)	-0.066** (-1.2833)	-0.024 (-0.7065)	-0.063 (-1.225)	-0.039 (-0.7449)
LA Sharpe ratio- one year	-0.002 (-0.0488)	0.008 (0.1852)	0.018 (0.2776)	0.01 (0.2316)	0.02 (0.3084)	0.01 (0.1509)
LA information ratio- seven-and-a-half-years	0.005 (0.2525)	0.005 (0.2352)	-0.009 (-0.2875)	0 (0)	-0.014 (-0.4472)	-0.014 (-0.4341)
LA information ratio- four years	0.015 (0.4076)	0.003 (0.0770)	0.017 (0.2924)	-0.012 (-0.3081)	0.002 (0.0344)	0.014 (0.2351)
LA information ratio- one year	-0.007 (-0.1707)	-0.008 (-0.1853)	-0.019 (-0.2971)	-0.001 (-0.0232)	-0.012 (-0.1876)	-0.011 (-0.1683)
LA Jensen alpha- seven-and-a-half-years	-0.009 (-0.0979)	-0.025 (-0.2577)	-0.157 (-1.0802)	-0.016 (-0.1649)	-0.148 (-1.0183)	-0.132 (-0.8882)
LA Jensen alpha- four years	-0.051 (-0.368)	-0.118 (-0.8050)	-0.236 (-1.077)	-0.067 (-0.4571)	-0.185 (-0.8442)	-0.118 (-0.5262)
LA Jensen alpha- one years	0.032 (0.2057)	0.072 (0.4363)	0.008 (0.0325)	0.04 (0.2424)	-0.024 (-0.0976)	-0.064 (-0.2539)
LA four-index alpha- seven-and-a-half-years	0.003 (0.0393)	-0.022 (-0.2725)	-0.19** (-1.5853)	-0.025 (-0.3097)	-0.193** (-1.6103)	-0.168** (-1.3695)
LA four-index alpha- four years	-0.011 (-0.1127)	-0.1 (-0.9742)	-0.189 (-1.225)	-0.089 (-0.867)	-0.178 (-1.1537)	-0.089 (-0.5649)
LA four-index alpha- one year	-0.049 (-0.2912)	-0.083 (-0.4651)	-0.267 (-1.0068)	-0.034 (-0.1905)	-0.218 (-0.822)	-0.184 (-0.677)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E11. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E17.

Tests of Differences in Coefficients: Sharpe Ratio Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- seven-and-a-half-years	-0.027**	-0.049*	-0.045**	-0.022	-0.018	0.004
	(-1.591)	(-2.6574)	(-1.6227)	(-1.1931)	(-0.6491)	(0.1396)
LA Sharpe ratio- four years	-0.046**	-0.111*	-0.096*	-0.065*	-0.05	0.015
	(-1.5489)	(-3.564)	(-2.084)	(-2.087)	(-1.0854)	(0.3191)
LA Sharpe ratio- one year	0.022	0.008	0.081	-0.014	0.059	0.073
	(0.5556)	(0.1915)	(1.2937)	(-0.3351)	(0.9423)	(1.1405)
LA information ratio- seven-and-a-half-years	-0.018	-0.036*	-0.028	-0.018	-0.01	0.008
	(-0.9091)	(-1.6933)	(-0.8944)	(-0.8466)	(-0.3194)	(0.2481)
LA information ratio- four years	-0.02	-0.066*	-0.058	-0.046	-0.038	0.008
	(-0.5657)	(-1.7583)	(-1.0212)	(-1.2255)	(-0.669)	(0.1375)
LA information ratio- one year	0.002	-0.024	0.028	-0.026	0.026	0.052
	(0.0505)	(-0.5745)	(0.4472)	(-0.6224)	(0.4153)	(0.8124)
LA Jensen alpha- seven-and-a-half-years	-0.14**	-0.208*	-0.274*	-0.068	-0.134	-0.066
	(-1.5713)	(-2.2262)	(-1.9574)	(-0.7278)	(-0.9573)	(-0.4623)
LA Jensen alpha- four years	-0.171**	-0.416*	-0.367*	-0.245*	-0.196	0.049
	(-1.3143)	(-3.0449)	(-1.7918)	(-1.7933)	(-0.9569)	(0.2344)
LA Jensen alpha- one years	0.075	-0.001	0.437	-0.076	0.362	0.438
	(0.4911)	(-0.0062)	(1.8231)	(-0.4729)	(1.5102)	(1.7888)
LA four-index alpha- seven-and-a-half-years	-0.125*	-0.149*	-0.224*	-0.024	-0.099	-0.075
	(-1.6677)	(-1.8964)	(-1.9045)	(-0.3055)	(-0.8417)	(-0.6252)
LA four-index alpha- four years	-0.121**	-0.286*	-0.142	-0.165*	-0.021	0.144
	(-1.2964)	(-2.9061)	(-0.968)	(-1.6766)	(-0.1432)	(0.9602)
LA four-index alpha- one year	-0.049	-0.288*	-0.035	-0.239**	0.014	0.253
	(-0.3013)	(-1.681)	(-0.1366)	(-1.395)	(0.0546)	(0.9662)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E12. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E18.

Tests of Differences in Coefficients: Information Ratio Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- seven-and-a-half-years	-0.02 (-1.1785)	-0.053* (-2.8743)	-0.034 (-1.2261)	-0.033* (-1.7897)	-0.014 (-0.5049)	0.019 (0.6631)
LA Sharpe ratio- four years	-0.041** (-1.3805)	-0.11* (-3.5319)	-0.089* (-1.932)	-0.069* (-2.2155)	-0.048 (-1.042)	0.021 (0.4467)
LA Sharpe ratio- one year	0.05 (1.2627)	0.01 (0.2394)	0.078 (1.2458)	-0.04 (-0.9576)	0.028 (0.4472)	0.068 (1.0624)
LA information ratio- seven-and-a-half-years	-0.011 (-0.5556)	-0.043* (-2.0957)	-0.012 (-0.3833)	-0.032** (-1.5596)	-0.001 (-0.0319)	0.031 (0.9759)
LA information ratio- four years	-0.018 (-0.5091)	-0.081* (-2.1579)	-0.034 (-0.6082)	-0.063* (-1.6784)	-0.016 (-0.2862)	0.047 (0.8202)
LA information ratio- one year	0.031 (0.7829)	-0.017 (-0.407)	0.022 (0.3565)	-0.048 (-1.1491)	-0.009 (-0.1458)	0.039 (0.6177)
LA Jensen alpha- seven-and-a-half-years	-0.103 (-1.1747)	-0.241* (-2.598)	-0.211** (-1.522)	-0.138** (-1.4877)	-0.108 (-0.779)	0.03 (0.2114)
LA Jensen alpha- four years	-0.172** (-1.3514)	-0.428* (-3.1813)	-0.343* (-1.7044)	-0.256* (-1.9028)	-0.171 (-0.8497)	0.085 (0.4128)
LA Jensen alpha- one years	0.178 (1.1763)	0.045 (0.2825)	0.396 (1.6613)	-0.133 (-0.835)	0.218 (0.9146)	0.351 (1.4415)
LA four-index alpha- seven-and-a-half-years	-0.067 (-0.8939)	-0.166* (-2.1128)	-0.196* (-1.66)	-0.099 (-1.26)	-0.129 (-1.0968)	-0.03 (-0.2501)
LA four-index alpha- four years	-0.082 (-0.892)	-0.272* (-2.8041)	-0.178 (-1.2247)	-0.19* (-1.9588)	-0.096 (-0.6605)	0.094 (0.6325)
LA four-index alpha- one year	0.017 (0.1055)	-0.286* (-1.6832)	-0.016 (-0.063)	-0.303* (-1.7832)	-0.033 (-0.1299)	0.27 (1.0399)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E13. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E19.

Tests of Differences in Coefficients: Jensen Alpha Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- seven-and-a-half-years	-0.011 (-0.6482)	-0.05* (-2.7116)	-0.035 (-1.2621)	-0.039* (-2.1151)	-0.024 (-0.8655)	0.015 (0.5335)
LA Sharpe ratio- four years	-0.026 (-0.8755)	-0.105* (-3.3713)	-0.118* (-2.5616)	-0.079* (-2.5365)	-0.092* (-1.9972)	-0.013 (-0.2765)
LA Sharpe ratio- one year	0.035 (0.8839)	-0.005 (-0.1197)	0.105 (1.6771)	-0.04 (-0.9576)	0.07 (1.1180)	0.11 (1.7185)
LA information ratio- seven-and-a-half-years	-0.005 (-0.2525)	-0.038* (-1.852)	-0.006 (-0.1973)	-0.033** (-1.6083)	-0.001 (-0.0329)	0.032 (1.0360)
LA information ratio- four years	-0.008 (-0.2357)	-0.068* (1.8824)	-0.015 (-0.2795)	-0.06* (-1.6609)	-0.007 (-0.1304)	0.053 (0.9624)
LA information ratio- one year	0.022 (0.5556)	-0.036 (-0.8618)	0.053 (0.8465)	-0.058** (-1.3885)	0.031 (0.4951)	0.089 (1.3905)
LA Jensen alpha- seven-and-a-half-years	-0.063 (-0.7303)	-0.217* (-2.3755)	-0.193** (-1.415)	-0.154* (-1.6858)	-0.13 (-0.9531)	0.024 (0.1718)
LA Jensen alpha- four years	-0.106 (-0.8328)	-0.371* (-2.7729)	-0.482* (-2.4058)	-0.265* (-1.9806)	-0.376* (-1.8767)	-0.111 (-0.5426)
LA Jensen alpha- one years	0.119 (0.7864)	-0.017 (-0.1062)	0.462 (1.9309)	-0.136 (-0.8498)	0.343 (1.4337)	0.479 (1.9562)
LA four-index alpha- seven-and-a-half-years	-0.027 (-0.3672)	-0.158* (-2.0283)	-0.129 (-1.101)	-0.131* (-1.6817)	-0.102 (-0.8705)	0.029 (0.2418)
LA four-index alpha- four years	-0.015 (-0.1632)	-0.24* (-2.4742)	-0.205** (-1.4104)	-0.225* (-2.3196)	-0.19** (-1.3072)	0.035 (0.2355)
LA four-index alpha- one year	-0.039 (-0.2398)	-0.313* (-1.819)	-0.195 (-0.7583)	-0.274** (-1.5924)	-0.156 (-0.6067)	0.118 (0.4483)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E14. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E20.

Tests of Differences in Coefficients: Four-Index Alpha Ratings as Predictor

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio- seven-and-a-half-years	0.013 (0.7071)	-0.006 (-0.3141)	0.017 (0.5848)	-0.019 (-0.9945)	0.004 (0.1376)	0.023 (0.7789)
LA Sharpe ratio- four years	0.022 (0.6764)	-0.039 (-1.1481)	-0.007 (-0.1361)	-0.061* (-1.7957)	-0.029 (-0.5639)	0.032 (0.6112)
LA Sharpe ratio- one year	0.008 (0.1951)	-0.037 (-0.8568)	0.067 (1.0476)	-0.045 (-1.042)	0.059 (0.9226)	0.104 (1.5909)
LA information ratio- seven-and-a-half-years	0.02 (1.0101)	0.017 (0.7996)	0.049 (1.5625)	-0.003 (-0.1411)	0.029 (0.9264)	0.032 (0.9923)
LA information ratio- four years	0.053 (1.4991)	0.033 (0.8791)	0.091 (1.6022)	-0.02 (-0.5328)	0.038 (0.6690)	0.058 (0.9969)
LA information ratio- one year	0 (0)	-0.063** (-1.5081)	0.032 (0.5111)	-0.063** (-1.5081)	0.032 (0.5111)	0.095 (1.4842)
LA Jensen alpha- seven-and-a-half-years	0.081 (0.8812)	0.038 (0.3918)	0.084 (0.5779)	-0.043 (-0.4433)	0.003 (0.0206)	0.046 (0.3095)
LA Jensen alpha- four years	0.105 (0.7499)	-0.074 (-0.5026)	0.085 (0.3855)	-0.179 (-1.2156)	-0.02 (-0.0907)	0.159 (0.7062)
LA Jensen alpha- one years	0 (0)	-0.145 (-0.8981)	0.3 (1.2423)	-0.145 (-0.8981)	0.3 (1.2423)	0.445 (1.8009)
LA four-index alpha- seven-and-a-half-years	0.045 (0.5893)	-0.023 (-0.2849)	-0.053 (-0.4389)	-0.068 (-0.8424)	-0.098 (-0.8116)	-0.03 (-0.2428)
LA four-index alpha- four years	0.047 (0.4887)	-0.165** (-1.618)	-0.045 (-0.2942)	-0.212* (-2.0788)	-0.092 (-0.6015)	0.12 (0.7659)
LA four-index alpha- one year	0.016 (0.0959)	-0.18 (-1.0209)	0.253 (0.9589)	-0.196 (-1.1117)	0.237 (0.8982)	0.433 (1.6042)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table E15. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses. LA = Load Adjusted.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table E21.

Summary of the Test of Difference in Coefficients: Comparison of Different Predictors

for Complete Funds

Country	Difference of coefficient has correct negative sign	Predictors				
		Sharpe ratio rank	Information ratio rank	Jensen alpha rank	Four-index alpha rank	Morningstar star
U.S.	Total (out of 72)	70 (33)	40 (23)	45 (29)	36 (15)	25 (0)
	4-star vs. 3-star funds (out of 12)	12 (4)	12 (11)	12 (9)	9 (5)	8 (0)
	4-star vs. 2-star funds (out of 12)	12 (8)	12 (7)	12 (9)	8 (4)	1 (0)
	4-star vs. 1-star funds (out of 12)	12 (7)	7 (4)	7 (6)	5 (3)	6 (0)
	3-star vs. 2-star funds (out of 12)	11 (6)	7 (1)	12 (5)	4 (0)	0 (0)
	3-star vs. 1-star funds (out of 12)	12 (6)	2 (0)	2 (0)	5 (3)	2 (0)
	2-star vs. 1-star funds (out of 12)	11 (2)	0 (0)	0 (0)	5 (0)	8 (0)
Canada	Total (out of 72)	51 (24)	50 (23)	53 (26)	29 (5)	53 (4)
	4-star vs. 3-star funds (out of 12)	9 (6)	8 (2)	9 (0)	0 (0)	7 (0)
	4-star vs. 2-star funds (out of 12)	11 (9)	10 (9)	12 (9)	9 (2)	8 (0)
	4-star vs. 1-star funds (out of 12)	9 (5)	9 (4)	9 (4)	3 (0)	9 (2)
	3-star vs. 2-star funds (out of 12)	12 (4)	12 (8)	12 (10)	12 (3)	9 (0)
	3-star vs. 1-star funds (out of 12)	8 (0)	10 (0)	9 (3)	4 (0)	10 (1)
	2-star vs. 1-star funds (out of 12)	2 (0)	1 (0)	2 (0)	1 (0)	10 (1)

Note. Significant cases are in parentheses.

<p align="center">Appendix – F</p>

Bull Period Funds-U.S.

Table F1.

Regression Analysis Using Morningstar Star as Predictor: Four-and-a-Half-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.365* (46.637)	-0.006 (-0.589)	-0.010 (-1.082)	-0.015** (-1.442)	-0.019 (-1.234)	0.766	-0.001
LA information ratio	0.051* (5.615)	0.004 (0.378)	0.007 (0.695)	0.024 (1.995)	0.043 (2.479)	2.594*	0.008
LA Jensen alpha	0.138* (4.060)	0.027 (0.648)	-0.030 (-0.748)	0.005 (0.118)	0.044 (0.679)	1.001	0.000
LA four-index alpha	0.082* (3.326)	-0.001 (-0.020)	-0.051* (-1.758)	-0.034 (-1.021)	-0.004 (-0.090)	1.606	0.003

Note. Sample size of 810 included those funds that had an overall rating on January 1, 2003. Out-of-sample returns data used for the analysis is from January 2003 to June 2007. *t*-statistics are in the parentheses.
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Bear Period Funds-U.S.

Table F2.

Regression Analysis Using Morningstar Star as Predictor: Three-and-a-Half-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.018* (2.796)	-0.006 (-0.848)	-0.018* (-2.542)	-0.015* (-1.979)	-0.017* (-1.789)	2.709*	0.008
LA information ratio	0.046* (7.175)	-0.007 (-0.984)	-0.018* (-2.554)	-0.014* (-1.921)	-0.017* (-1.761)	2.626*	0.008
LA Jensen alpha	0.331* (7.071)	-0.030 (-0.559)	-0.113* (-2.227)	-0.090* (-1.696)	-0.131* (-1.893)	2.550*	0.008
LA four-index alpha	0.145* (3.390)	-0.068** (-1.363)	-0.136* (-2.926)	-0.109* (-2.235)	-0.166* (-2.606)	3.223*	0.011

Note. Sample size of 810 included those funds that had an overall rating on July 1, 2007. Out-of-sample returns data used for the analysis is from July 2007 to December 2010. *t*-statistics are in the parentheses.
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Table F3.

Tests of Differences in Coefficients: Bull Period

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.004	-0.009	-0.013	-0.005	-0.009	-0.004
	(-0.2973)	(-0.6054)	(-0.7211)	(-0.3518)	(-0.5145)	(-0.215)
LA information ratio	0.003	0.02	0.039	0.017	0.036	0.019
	(0.1929)	(1.2286)	(1.9261)	(1.0443)	(1.7779)	(0.9131)
LA Jensen alpha	-0.057	-0.022	0.017	0.035	0.074	0.039
	(-0.9951)	(-0.357)	(0.2212)	(0.5742)	(0.9695)	(0.4898)
LA four-index alpha	-0.05	-0.033	-0.003	0.017	0.047	0.03
	(-1.1983)	(-0.7399)	(-0.0538)	(0.387)	(0.8510)	(0.5224)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table F1. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses.

* indicates significance at the 5% level.

Table F4.

Tests of Differences in Coefficients: Bear Period

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.012	-0.009	-0.011	0.003	0.001	-0.002
	(-1.1289)	(-0.8466)	(-0.859)	(0.303)	(0.0819)	(-0.1638)
LA Information ratio	-0.011	-0.007	-0.01	0.004	0.001	-0.003
	(-1.1112)	(-0.7071)	(-0.8192)	(0.4041)	(0.0819)	(-0.2458)
LA Jensen alpha	-0.083	-0.06	-0.101	0.023	-0.018	-0.041
	(-1.1174)	(-0.793)	(-1.1527)	(0.3127)	(-0.2098)	(-0.4712)
LA Four-index alpha	-0.068	-0.041	-0.098	0.027	-0.03	-0.057
	(-1.0009)	(-0.5857)	(-1.2067)	(0.4017)	(-0.3806)	(-0.7072)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table F2. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses.

* indicates significance at the 5% level.

Bull Period Funds-Canada

Table F5.

Regression Analysis Using Morningstar Star as Predictor: Four-and-a-Half-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.399* (19.733)	0.000 (0.017)	-0.010 (-0.419)	-0.044** (-1.557)	-0.020 (-0.456)	0.897	-0.002
LA information ratio	-0.057* (-2.505)	0.050 (1.696)	0.041 (1.500)	0.013 (0.412)	0.127 (2.549)	2.109**	0.024
LA Jensen alpha	0.145* (2.414)	-0.039 (-0.498)	-0.124* (-1.696)	-0.199* (-2.361)	0.116 (0.877)	2.593*	0.034
LA four-index alpha	0.074** (1.336)	-0.022 (-0.304)	-0.082 (-1.214)	-0.166* (-2.128)	0.088 (0.715)	1.942	0.020

Note. Sample size of 183 included those funds that had an overall rating on January 1, 2003. Out-of-sample returns data used for the analysis is from January 2003 to June 2007. *t*-statistics are in the parentheses.
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Bear Period Funds-Canada

Table F6.

Regression Analysis Using Morningstar Star as Predictor: Two-and-a-Half-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	-0.064* (-3.943)	-0.016 (-0.853)	-0.017 (-0.947)	-0.033* (-1.705)	-0.004 (-0.144)	0.935	-0.001
LA information ratio	0.014 (0.858)	-0.004 (-0.211)	-0.010 (-0.557)	-0.019 (-1.015)	0.011 (0.362)	0.596	-0.009
LA Jensen alpha	0.140 (1.222)	-0.116 (-0.903)	-0.163** (-1.312)	-0.248* (-1.831)	-0.065 (-0.296)	1.058	0.001
LA four-index alpha	0.020 (0.155)	-0.059 (-0.404)	-0.176 (-1.237)	-0.255* (-1.649)	0.041 (0.164)	1.458	0.010

Note. Sample size of 183 included those funds that had an overall rating on July 1, 2007. Out-of-sample returns data used for the analysis is from July 2007 to December 2009. *t*-statistics are in the parentheses.
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Table F7.

Tests of Differences in Coefficients: Bull Period

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.01	-0.044	-0.02	-0.034	-0.01	0.024
	(-0.2772)	(-1.1515)	(-0.3848)	(-0.9058)	(-0.1943)	(0.4528)
LA information ratio	-0.009	-0.037	0.077	-0.028	0.086	0.114
	(-0.2271)	(-0.8568)	(1.3322)	(-0.6688)	(1.5134)	(1.9204)
LA Jensen alpha	-0.085	-0.16**	0.155	-0.075	0.24	0.315
	(-0.7956)	(-1.3958)	(1.0053)	(-0.6739)	(1.5819)	(2.0025)
LA four-index alpha	-0.06	-0.144**	0.11	-0.084	0.17	0.254
	(-0.6101)	(-1.3566)	(0.7718)	(-0.8169)	(1.2137)	(1.7439)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table F5. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses.

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table F8.

Tests of Differences in Coefficients: Bear Period

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.001	-0.017	0.012	-0.016	0.013	0.029
	(-0.0393)	(-0.6495)	(0.3348)	(-0.6113)	(0.3627)	(0.7976)
LA information ratio	-0.006	-0.015	0.015	-0.009	0.021	0.03
	(-0.2423)	(-0.5731)	(0.4288)	(-0.353)	(0.6090)	(0.8448)
LA Jensen alpha	-0.047	-0.132	0.051	-0.085	0.098	0.183
	(-0.2637)	(-0.7095)	(0.2017)	(-0.4637)	(0.3908)	(0.7137)
LA four-index alpha	-0.117	-0.196	0.1	-0.079	0.217	0.296
	(-0.5725)	(-0.9175)	(0.3458)	(-0.3758)	(0.7570)	(1.0092)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table F6. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. z-statistics are in the parentheses.

* indicates significance at the 5% level.

Table F9

Summary of the Test of Difference in Coefficients: Comparison of Bull and Bear Periods for Complete Funds

Country	Difference of coefficient has correct negative sign	Bull period	Bear period
		LA	LA
U.S.	Total (out of 24)	11 (0)	18 (0)
	4-star vs. 3-star funds (out of 4)	3 (0)	4 (0)
	4-star vs. 2-star funds (out of 4)	3 (0)	4 (0)
	4-star vs. 1-star funds (out of 4)	2 (0)	4 (0)
	3-star vs. 2-star funds (out of 4)	1(0)	0 (0)
	3-star vs. 1-star funds (out of 4)	1(0)	2 (0)
	2-star vs. 1-star funds (out of 4)	1(0)	4 (0)
Canada	Total (out of 24)	14 (2)	12 (0)
	4-star vs. 3-star funds (out of 4)	4 (0)	4 (0)
	4-star vs. 2-star funds (out of 4)	4 (2)	4 (0)
	4-star vs. 1-star funds (out of 4)	1 (0)	0 (0)
	3-star vs. 2-star funds (out of 4)	4 (0)	4 (0)
	3-star vs. 1-star funds (out of 4)	1 (0)	0 (0)
	2-star vs. 1-star funds (out of 4)	0 (0)	0 (0)

Note. Significant cases are in parentheses. LA = Load-Adjusted

Appendix – G

Morningstar's New Methodology Rated Funds- U.S. Complete Funds

Table G1.

Regression Analysis Using Morningstar Star as Predictor: Nine-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.107* (15.175)	-0.003 (-0.320)	-0.005 (-0.631)	0.002 (0.191)	-0.005 (-0.350)	0.310	-0.009
LA information ratio	0.033* (4.137)	0.001 (0.142)	0.002 (0.165)	0.010 (1.006)	0.005 (0.319)	0.454	-0.007
LA Jensen alpha	0.172* (2.948)	0.030 (0.442)	0.057 (0.843)	0.085 (1.180)	0.121 (0.968)	0.553	-0.006
LA four-index alpha	0.099* (1.765)	0.036 (0.547)	0.047 (0.725)	0.049 (0.705)	0.083 (0.689)	0.196	-0.010

Note. Sample size of 319 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2011. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table G2.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.199* (16.880)	-0.006 (-0.454)	-0.013 (-0.965)	-0.014 (-0.985)	-0.034** (-1.344)	0.655	-0.004
LA information ratio	0.050* (3.642)	0.001 (0.072)	0.005 (0.336)	0.009 (0.547)	-0.005 (-0.165)	0.158	-0.011
LA Jensen alpha	0.258* (3.039)	0.024 (0.247)	0.073 (0.745)	0.057 (0.548)	0.116 (0.640)	0.250	-0.010
LA four-index alpha	0.079* (1.713)	-0.018 (-0.339)	-0.036 (-0.673)	-0.058 (-1.017)	-0.053 (-0.538)	0.354	-0.008

Note. Sample size of 319 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2006. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table G3.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.026* (1.697)	-0.035* (-1.956)	-0.036* (-2.020)	-0.016 (-0.861)	-0.027 (-0.809)	1.442	0.006
LA information ratio	0.016 (0.987)	-0.035* (-1.926)	-0.035* (-1.941)	-0.015 (-0.774)	-0.025 (-0.750)	1.416	0.005
LA Jensen alpha	0.157** (1.575)	-0.217* (-1.869)	-0.178** (-1.539)	-0.079 (-0.646)	-0.194 (-0.907)	1.195	0.002
LA four-index alpha	0.256* (1.736)	-0.233** (-1.358)	-0.065 (-0.380)	-0.151 (-0.829)	0.011 (0.036)	0.749	-0.003

Note. Sample size of 319 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2003. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Morningstar's Old Methodology Rated Funds-U.S. Complete Funds

Table G4.

Regression Analysis Using Morningstar Star as Predictor: Nine-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.136* (13.051)	-0.004 (-0.323)	-0.002 (-0.140)	-0.016 (-1.271)	-0.029* (-1.917)	1.758	0.009
LA information ratio	0.000 (0.042)	-0.014 (-1.183)	-0.009 (-0.792)	-0.010 (-0.842)	0.000 (0.028)	0.571	-0.005
LA Jensen alpha	0.124* (2.441)	-0.071 (-1.167)	-0.061 (-1.049)	-0.075 (-1.211)	-0.070 (-0.960)	0.430	-0.007
LA four-index alpha	-0.139* (-2.444)	-0.004 (-0.053)	0.038 (0.587)	0.020 (0.283)	-0.011 (-0.133)	0.263	-0.009

Note. Sample size of 319 included those funds that had an overall rating on June 1, 1993. Out-of-sample returns data used for the analysis is from June 1993 to May 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table G5.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.279* (15.061)	0.026 (1.166)	0.030 (1.414)	-0.020 (-0.882)	-0.070* (-2.644)	6.989*	0.070
LA information ratio	-0.085* (-4.601)	0.002 (0.074)	0.006 (0.284)	0.001 (0.026)	0.009 (0.337)	0.062	-0.012
LA Jensen alpha	-0.030 (-0.588)	0.010 (0.160)	0.004 (0.069)	-0.102** (-1.609)	-0.137* (-1.845)	2.740*	0.021
LA four-index alpha	-0.228* (-3.773)	0.088 (1.224)	0.147 (2.113)	0.091 (1.228)	0.061 (0.699)	1.274	0.003

Note. Sample size of 319 included those funds that had an overall rating on June 1, 1993. Out-of-sample returns data used for the analysis is from June 1993 to May 1997. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table G6.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.147* (4.524)	0.002 (0.052)	-0.007 (-0.199)	-0.031 (-0.787)	-0.078* (-1.676)	1.267	0.003
LA information ratio	0.122* (3.733)	-0.000 (-0.008)	-0.012 (-0.313)	-0.033 (-0.814)	-0.078* (-1.656)	1.159	0.002
LA Jensen alpha	0.398* (3.742)	0.000 (0.003)	-0.004 (-0.034)	-0.050 (-0.386)	-0.277* (-1.816)	1.385	0.005
LA four-index alpha	0.169** (1.441)	0.007 (0.052)	-0.011 (-0.085)	-0.096 (-0.673)	-0.503* (-2.994)	3.786*	0.034

Note. Sample size of 319 included those funds that had an overall rating on June 1, 1993. Out-of-sample returns data used for the analysis is from June 1993 to May 1994. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table G7.

Tests of Differences in Coefficients: New Methodology: Nine-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.002	0.005	-0.002	0.007	0	-0.007
	(-0.1768)	(0.4152)	(-0.1176)	(0.5813)	(0)	(0.4002)
LA information ratio	0.001	0.009	0.004	0.008	0.003	-0.005
	(0.0786)	(0.6690)	(0.2080)	(0.5946)	(0.1560)	(-0.2535)
LA Jensen alpha	0.027	0.055	0.091	0.028	0.064	0.036
	(0.2808)	(0.5554)	(0.6395)	(0.2827)	(0.4498)	(0.2496)
LA four-index alpha	0.011	0.013	0.047	0.002	0.036	0.034
	(0.1197)	(0.1371)	(0.3444)	(0.0211)	(0.2638)	(0.2456)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G1. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table G8.

Tests of Differences in Coefficients: New Methodology: Four-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.007	-0.008	-0.028	-0.001	-0.021	-0.02
	(-0.3536)	(-0.3899)	(-0.9772)	(-0.0487)	(-0.7329)	(-0.686)
LA information ratio	0.004	0.008	-0.006	0.004	-0.01	-0.014
	(0.1768)	(0.3427)	(-0.1812)	(0.1713)	(-0.3019)	(-0.4165)
LA Jensen alpha	0.049	0.033	0.092	-0.016	0.043	0.059
	(0.3499)	(0.2287)	(0.4441)	(-0.1109)	(0.2076)	(0.2808)
LA four-index alpha	-0.018	-0.04	-0.035	-0.022	-0.017	0.005
	(-0.2401)	(-0.5139)	(-0.3117)	(-0.2827)	(-0.1514)	(0.0438)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G2. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table G9.
Tests of Differences in Coefficients: New Methodology: One-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.001	0.019	0.008	0.02	0.009	-0.011
	(-0.0393)	(0.726)	(0.2128)	(0.7642)	(0.2394)	(-0.2889)
LA information ratio	0	0.02	0.01	0.02	0.01	-0.01
	(0)	(0.7642)	(0.2599)	(0.7642)	(0.2599)	(-0.2567)
LA Jensen alpha	0.039	0.138	0.023	0.099	-0.016	-0.115
	(0.2377)	(0.8162)	(0.0945)	(0.5856)	(-0.0657)	(-0.4659)
LA four-index alpha	0.168	0.082	0.244	-0.086	0.076	0.162
	(0.6907)	(0.3275)	(0.6782)	(-0.3434)	(0.2112)	(0.4442)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G3. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.

Table G10.
Tests of Differences in Coefficients: Old Methodology: Nine-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	0.002	-0.012	-0.025	-0.014	-0.027	-0.013
	(0.1131)	(-0.6527)	(-1.2595)	(-0.7913)	(-1.4056)	(-0.6549)
LA information ratio	0.005	0.004	0.014	-0.001	0.009	0.01
	(0.3072)	(0.2357)	(0.7593)	(-0.0614)	(0.5055)	(0.5423)
LA Jensen alpha	0.01	-0.004	0.001	-0.014	-0.009	0.005
	(0.1188)	(-0.046)	(0.0105)	(-0.1649)	(-0.0965)	(0.0522)
LA four-index alpha	0.042	0.024	-0.007	-0.018	-0.049	-0.031
	(0.4432)	(0.2459)	(-0.0657)	(-0.1871)	(-0.4655)	(-0.2875)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G4. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Table G11.
Tests of Differences in Coefficients: Old Methodology: Four-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	0.004	-0.046**	-0.096*	-0.05**	-0.1*	-0.05**
	(0.1315)	(-1.4453)	(-2.7564)	(-1.6054)	(-2.9235)	(-1.4097)
LA information ratio	0.004	-0.001	0.007	-0.005	0.003	0.008
	(0.1315)	(-0.0314)	(0.2055)	(-0.1605)	(0.0898)	(0.2305)
LA Jensen alpha	-0.006	-0.112	-0.147**	-0.106	-0.141**	-0.035
	(-0.0701)	(-1.2671)	(-1.5227)	(-1.2281)	(-1.4898)	(-0.3601)
LA four-index alpha	0.059	0.003	-0.027	-0.056	-0.086	-0.03
	(0.5916)	(0.0291)	(-0.2391)	(-0.5535)	(-0.7745)	(-0.2627)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G5. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Table G12.
Tests of Differences in Coefficients: Old Methodology: One-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.009	-0.033	-0.08**	-0.024	-0.071	-0.047
	(-0.1674)	(-0.5907)	(-1.3099)	(-0.4405)	(-1.187)	(-0.7615)
LA information ratio	-0.012	-0.033	-0.078	-0.021	-0.066	-0.045
	(-0.2204)	(-0.5907)	(-1.2771)	(-0.3806)	(-1.092)	(-0.7291)
LA Jensen alpha	-0.004	-0.05	-0.277**	-0.046	-0.273**	-0.227
	(-0.0227)	(-0.2751)	(-1.3931)	(-0.258)	(-1.3951)	(-1.1306)
LA four-index alpha	-0.018	-0.103	-0.51*	-0.085	-0.492*	-0.407*
	(-0.1336)	(-0.7169)	(-3.0252)	(-0.4337)	(-2.2895)	(-1.8448)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G6. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Morningstar's New Methodology Rated Funds- Canada Complete Funds

Table G13.

Regression Analysis Using Morningstar Star as Predictor: Seven-and-a-Half-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.094* (6.457)	-0.007 (-0.399)	0.006 (0.354)	0.002 (0.090)	n/a	0.280	-0.041
LA information ratio	-0.018 (-1.197)	0.008 (0.410)	0.023 (1.179)	0.014 (0.627)	n/a	0.547	-0.025
LA Jensen alpha	0.016 (0.233)	-0.038 (-0.455)	0.032 (0.379)	-0.030 (-0.293)	n/a	0.370	-0.036
LA four-index alpha	-0.028 (-0.438)	0.007 (0.093)	0.055 (0.702)	0.035 (0.375)	n/a	0.250	-0.043

Note. Sample size of 56 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to December 2009.There was no one-Star rated fund in this sub-sample period. So, we removed the γ_4 from the analysis for this subsample. *t*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.

Table G14.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.305* (13.448)	-0.082* (-2.968)	-0.066* (-2.325)	-0.068* (-1.994)	n/a	3.056*	0.101
LA information ratio	-0.023 (-0.840)	-0.014 (-0.415)	0.015 (0.443)	-0.004 (-0.089)	n/a	0.359	-0.036
LA Jensen alpha	0.211* (2.344)	-0.246* (-2.233)	-0.174** (-1.553)	-0.257* (-1.907)	n/a	1.894	0.046
LA four-index alpha	0.120** (1.570)	-0.166* (-1.778)	-0.120 (-1.264)	-0.119 (-1.041)	n/a	1.060	0.003

Note. Sample size of 56 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2006.There was no one-Star rated fund in this sub-sample period. So, we removed the γ_4 from the analysis for this subsample. *t*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Table G15.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	-0.062** (-1.582)	-0.054 (-1.125)	-0.093* (-1.905)	-0.038 (-0.651)	n/a	1.273	0.015
LA information ratio	0.062** (1.587)	-0.087* (-1.810)	-0.123* (-2.520)	-0.075 (-1.272)	n/a	2.140	0.059
LA Jensen alpha	0.015 (0.108)	-0.116 (-0.671)	-0.258** (-1.472)	-0.055 (-0.263)	n/a	0.865	-0.007
LA four-index alpha	0.145 (0.991)	-0.198 (-1.107)	-0.336* (-1.844)	-0.315** (-1.438)	n/a	1.261	0.014

Note. Sample size of 56 included those funds that had an overall rating on July 1, 2002. Out-of-sample returns data used for the analysis is from July 2002 to June 2003. There was no one-Star rated fund in this sub-sample period. So, we removed the γ_4 from the analysis for this subsample. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

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Table G16.

Regression Analysis Using Morningstar Star as Predictor: Seven-and-a-Half-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.158* (7.833)	-0.020 (-0.743)	-0.039** (-1.518)	0.011 (0.392)	0.055 (1.470)	2.364**	0.090
LA information ratio	0.062* (3.450)	-0.028 (-1.186)	-0.039* (-1.709)	-0.005 (-0.224)	0.030 (0.899)	1.788	0.054
LA Jensen alpha	0.414* (5.059)	-0.151** (-1.383)	-0.205* (-1.983)	-0.060 (-0.541)	0.049 (0.323)	1.588	0.041
LA four-index alpha	0.341* (4.350)	-0.128 (-1.226)	-0.161** (-1.626)	-0.044 (-0.414)	0.005 (0.035)	1.000	0.000

Note. Sample size of 56 included those funds that had an overall rating on December 1, 1994. Out-of-sample returns data used for the analysis is from December 1994 to May 2002. *t*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

** indicates significance at the 10% level.

Table G17.

Regression Analysis Using Morningstar Star as Predictor: Four-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.141* (5.171)	-0.013 (-0.354)	-0.013 (-0.364)	0.048 (1.298)	0.116 (2.264)	2.623*	0.106
LA information ratio	0.006 (0.247)	-0.019 (-0.561)	-0.013 (-0.411)	0.027 (0.764)	0.086 (1.786)	1.709	0.049
LA Jensen alpha	0.146 (1.167)	-0.124 (-0.745)	-0.120 (-0.758)	0.107 (0.626)	0.320 (1.360)	1.537	0.038
LA four-index alpha	0.362* (3.105)	-0.156 (-1.005)	-0.102 (-0.694)	-0.065 (-0.409)	0.024 (0.109)	0.355	-0.049

Note. Sample size of 56 included those funds that had an overall rating on December 1, 1994. Out-of-sample returns data used for the analysis is from December 1994 to November 1998. *t*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.

Table G18.

Regression Analysis Using Morningstar Star as Predictor: One-Year

Out-of-sample performance measure	γ_0 (Constant)	γ_1 (4-Star)	γ_2 (3-Star)	γ_3 (2-Star)	γ_4 (1-Star)	F-Stat	Adj R^2
LA Sharpe ratio	0.225* (4.557)	-0.060 (-0.915)	-0.022 (-0.351)	-0.048 (-0.714)	0.008 (0.091)	0.324	-0.052
LA information ratio	0.042 (0.804)	-0.069 (-0.997)	-0.034 (-0.514)	-0.090** (-1.282)	-0.028 (-0.288)	0.511	-0.037
LA Jensen alpha	0.306* (1.728)	-0.362** (-1.539)	-0.205 (-0.918)	-0.278 (-1.158)	-0.101 (-0.304)	0.675	-0.024
LA four-index alpha	0.244 (0.754)	-0.514 (-1.191)	-0.193 (-0.473)	-0.151 (-0.344)	0.365 (0.601)	0.706	-0.022

Note. Sample size of 56 included those funds that had an overall rating on December 1, 1994. Out-of-sample returns data used for the analysis is from December 1994 to November 1995. *t*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.
** indicates significance at the 10% level.

Table G19.

Tests of Differences in Coefficients: New Methodology: Seven-and-a-Half-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	0.013 (0.5107)	0.009 (0.3166)	n/a	-0.004 (-0.1407)	n/a	n/a
LA information ratio	0.015 (0.5582)	0.006 (0.2011)	n/a	-0.009 (-0.3017)	n/a	n/a
LA Jensen alpha	0.07 (0.5963)	0.008 (0.0615)	n/a	-0.062 (-0.472)	n/a	n/a
LA four-index alpha	0.048 (0.4379)	0.028 (0.2304)	n/a	-0.02 (-0.1637)	n/a	n/a

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G13. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. There was no one-Star rated fund in this sub-sample period. So, we removed the γ_4 from the analysis for this subsample. *z*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.

Table G20.

Tests of Differences in Coefficients: New Methodology: Four-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	0.016 (0.4041)	0.014 (0.3179)	n/a	-0.002 (-0.0454)	n/a	n/a
LA information ratio	0.029 (0.6121)	0.01 (0.1928)	n/a	-0.019 (-0.3619)	n/a	n/a
LA Jensen alpha	0.072 (0.4587)	-0.011 (-0.0632)	n/a	-0.083 (-0.4732)	n/a	n/a
LA four-index alpha	0.046 (0.3460)	0.047 (0.3195)	n/a	0.001 (0.0067)	n/a	n/a

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G14. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. There was no one-Star rated fund in this sub-sample period. So, we removed the γ_4 from the analysis for this subsample. *z*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.

Table G21.

Tests of Differences in Coefficients: New Methodology-One Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.039 (-0.5686)	0.016 (0.2104)	n/a	0.055 (0.7171)	n/a	n/a
LA information ratio	-0.036 (-0.5248)	0.012 (0.1578)	n/a	0.048 (0.6259)	n/a	n/a
LA Jensen alpha	-0.142 (-0.5787)	0.061 (0.2241)	n/a	0.203 (0.7405)	n/a	n/a
LA four-index alpha	-0.138 (-0.5406)	-0.117 (-0.4137)	n/a	0.021 (0.0737)	n/a	n/a

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G15. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. There was no one-Star rated fund in this sub-sample period. So, we removed the γ_4 from the analysis for this subsample. *z*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.

Table G22.

Tests of Differences in Coefficients: Old Methodology: Seven-and-a-Half-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	-0.019 (-0.5164)	0.031 (0.8119)	0.075 (1.6089)	0.05 (1.3588)	0.094 (2.0666)	0.044 (0.9439)
LA information ratio	-0.011 (-0.3309)	0.023 (0.6776)	0.058 (1.4214)	0.034 (1.0228)	0.069 (1.7154)	0.035 (0.8578)
LA Jensen alpha	-0.054 (-0.3601)	0.091 (0.5849)	0.2 (1.0646)	0.145 (0.9576)	0.254 (1.3771)	0.109 (0.5767)
LA four-index alpha	-0.033 (-0.2298)	0.084 (0.5657)	0.133 (0.7386)	0.117 (0.8067)	0.166 (0.9366)	0.049 (0.2703)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G16. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted
* indicates significance at the 5% level.

Table G23.

Tests of Differences in Coefficients: Old Methodology: Four-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	0	0.061	0.129	0.061	0.129	0.068
	(0)	(1.1816)	(2.0665)	(1.2139)	(2.1046)	(1.0792)
LA information ratio	0.006	0.046	0.105	0.04	0.099	0.059
	(0.1266)	(0.9427)	(1.7851)	(0.8315)	(1.6996)	(0.9932)
LA Jensen alpha	0.004	0.231	0.444	0.227	0.44	0.213
	(0.0174)	(0.9693)	(1.5401)	(0.9781)	(1.5538)	(0.7344)
LA four-index alpha	0.054	0.091	0.18	0.037	0.126	0.089
	(0.2528)	(0.4111)	(0.6729)	(0.1714)	(0.4792)	(0.3306)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G17. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table G24.

Tests of Differences in Coefficients: Old Methodology: One-Year

Out-of-sample performance measure	γ_1 vs. γ_2	γ_1 vs. γ_3	γ_1 vs. γ_4	γ_2 vs. γ_3	γ_2 vs. γ_4	γ_3 vs. γ_4
LA Sharpe ratio	0.038	0.012	0.068	-0.026	0.03	0.056
	(0.4196)	(0.1276)	(0.6006)	(-0.2848)	(0.2704)	(0.4920)
LA information ratio	0.035	-0.021	0.041	-0.056	0.006	0.062
	(0.3666)	(-0.2121)	(0.3444)	(-0.5777)	(0.0511)	(0.5158)
LA Jensen alpha	0.157	0.084	0.261	-0.073	0.104	0.177
	(0.4846)	(0.2501)	(0.6429)	(-0.2228)	(0.2606)	(0.4329)
LA four-index alpha	0.321	0.363	0.879	0.042	0.558	0.516
	(0.5403)	(0.59)	(1.1807)	(0.07)	(0.7624)	(0.6888)

Note. This table reports the difference in the coefficient used in the dummy variable regression Equation 9 and presented in Table G18. If the difference of coefficient is negative and significant then it designates that the lower-rated fund performs significantly worse on average than the higher-rated fund. *z*-statistics are in the parentheses. LA = Load-Adjusted

* indicates significance at the 5% level.

Table G25

Summary of Tests of Difference in Coefficients: Comparison of Old and New Star Rating Methodologies for Complete Funds

Method	Difference of coefficient has correct negative sign	U.S.			Canada		
		Nine years	Four years	One year	Seven a and half years	Four years	One year
New	Total (out of 24 or 12)	4 (0)	15 (0)	6 (0)	4 (0)	4 (0)	5 (0)
	4-star vs. 3-star funds (out of 4)	1 (0)	2 (0)	1 (0)	0 (0)	0 (0)	4 (0)
	4-star vs. 2-star funds (out of 4)	0 (0)	2 (0)	0 (0)	0 (0)	1 (0)	1 (0)
	4-star vs. 1-star funds (out of 4)	1 (0)	3 (0)	0 (0)	n/a	n/a	n/a
	3-star vs. 2-star funds (out of 4)	0 (0)	3 (0)	1 (0)	4 (0)	3 (0)	0 (0)
	3-star vs. 1-star funds (out of 4)	0 (0)	3 (0)	1 (0)	n/a	n/a	n/a
	2-star vs. 1-star funds (out of 4)	2 (0)	2 (0)	3 (0)	n/a	n/a	n/a
Old	Total (out of 24)	13 (1)	17 (7)	24 (6)	4 (0)	0 (0)	4 (0)
	4-star vs. 3-star funds (out of 4)	0 (0)	1 (0)	4 (0)	4 (0)	0 (0)	0 (0)
	4-star vs. 2-star funds (out of 4)	2 (0)	3 (1)	4 (0)	0 (0)	0 (0)	1 (0)
	4-star vs. 1-star funds (out of 4)	2 (0)	3 (2)	4 (3)	0 (0)	0 (0)	0 (0)
	3-star vs. 2-star funds (out of 4)	4 (0)	4 (1)	4 (0)	0 (0)	0 (0)	3 (0)
	3-star vs. 1-star funds (out of 4)	3 (1)	3 (2)	4 (2)	0 (0)	0 (0)	0 (0)
	2-star vs. 1-star funds (out of 4)	2 (0)	3 (1)	4 (1)	0 (0)	0 (0)	0 (0)

Note. Significant cases are in parentheses.