Investors' Trust in Mutual Fund Managers

Katherine Judge

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Abstract

The Gennaioli et al. (2015) theory on investors' trust in financial managers is explored empirically in the context of mutual funds. The authors relate higher expense ratios to more trustworthy managers and lower returns in their respective funds. Evidence indicates that mutual funds with relatively high expense ratios have lower returns than low expense ratio funds for most of 2008 and 2009, before fees are accounted for within returns. The co-movement of expense ratio and excess returns from 2008 – 2009 is more negative for high expense ratio funds, confirming the Gennaioli et al. hypothesis that higher expense ratios predict more trustworthy managers and lower excess returns, before fees are netted out. Trust and expense ratio are positively correlated over 2008 and negatively over 2009; documenting a shift in investors' attitudes toward fund managers following the 2008 crisis. Retail funds have more trusting clients and higher expense ratios than institutional funds. Differences found in returns between funds with the same the expense ratio are caused by trust, this paper posits. Including an expense ratio factor in the Fama-French (1993) model and the Moskowitz et al. (2011) value and momentum expected return model increases the explanatory power of both models. Evidence indicates a negative impact on gross expected returns as expense ratio increases. High expense ratio funds' returns are better explained by these models than low expense ratio funds', owing to the negative impact that trust has on returns received through a lowered perception of risk of the fund by trusting investors. Institutional fund returns are better predicted than retail fund returns. Inconsistencies between the aforementioned models' results for funds classified by levels of trust cannot confirm the Gennaioli et al. hypothesis. The importance of measuring the level of trust that investors have is reinforced by this analysis.

I. Introduction

Trust in financial institutions is a pillar of a healthy economy. Without it, bank runs transpire and the financial system comes to a halt. Mutual funds are not immune to such events. As the complexity of financial instruments continues to increase, the severity of runs on mutual funds has the potential to be disastrous. Such events are a result of waning confidence in these financial managers. To understand this crucial aspect of today's economy, evidence on the trustworthiness of mutual fund managers is required. Recent research has determined that capital allocation to mutual funds is partially governed by trust[1]. Drawing on work by Gennaioli et al. (2015), this paper tests the authors' measure of trust, using mutual fund data. Evidence on the authors' theory for the relationship between expense ratios, excess returns and investors' trust for them is examined. The effect of the 2008 financial crisis on the level of trust that clients have for mutual fund managers is investigated through multiple channels.

Despite the consistent underperformance of funds compared to passive investment strategies such as indexes[2], mutual funds remain popular. Several theories explaining this observation exist[3]. The most recent model, Gennaioli et al. (2015), has yet to be tested empirically. Providing a basis for this analysis are studies that use micro evidence to show that households would rather not invest in assets at all if they do not trust their manager[4]. This supports the notion that investors' trust toward managers governs their decision to invest in specific mutual funds, given different fees and other fund-specific characteristics, even when returns are subpar.

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[1] See Georgarakos and Inderst (2011) and Guiso et al. (2008).
[2] See "Farewell to the fund manager?" *Financial Times*, Oct. 10, 2014; "Hedge Funds: Going Nowhere Fast." *The Economist*, Dec. 22, 2012.
[3] See Berk and Green (2004), for example.
[4] See Georgarakos and Inderst (2011).

Drawing on recent events provides an opportunity to gain insight into how trust translates into mutual fund fees and returns during an aggressive economic downturn. Gennailoi et al. (2015) lay the framework for trust to be measured as investors' lowered perception of risk that accompanies a trustworthy manager. This explains investors' willingness to continue investing in funds that underperform benchmarks. Investors' trust in managers is a combination of the individual investor's general trusting attitude in addition to the perceived trustworthiness of the manager[5]. This measure of trust is influenced by the individual characteristics of investors that are unobtainable through data for mutual funds. The measure of trust examined will represent both of the aforementioned factors. This measure of trust is examined for the period preceding the 2008 financial crisis, through to the crisis and the recovery beginning in 2009. A comparative analysis conforming to the Gennailoi et al. (2015) theory is employed in the context of fees and returns to gather evidence on the importance of trust in this context. Additionally, an investigation into how this measure relates to the Fama-French (1993) model of expected returns and the value and momentum model (Moscowitz et al., 2011) is done. Possible quantifications of a "trust" variable are examined in these contexts.

This issue is examined in multiple stages. Motivated by Gennaioli et al. (2015), the following topics are addressed: (i) Does the fee structure of mutual funds relate to excess returns in the data in the way that Gennaioli et al. (2015) posit? (ii) Is there evidence in the data that relates a lowered perception of risk to trust as the authors suggest? (iii) How does the authors' measure of trust relate to institutional and retail funds? (iv) Can the authors' theory on trust integrate well into the Fama-French or Moskowitz et al. expected value models? (v) Can this analysis of trust shed light on the 2008 financial crisis? The process for evaluating these

[5] See Guiso et al. (2008).

questions is detailed in section III. The results of this analysis are sometimes inconsistent with the theory being tested; this is expanded on in section IV.

Section II reviews literature related to manager-client relations. Section III reviews the data and methodology for analysis. Section IV presents implications of the findings, and section V contains concluding remarks.

II. Related Literature

Finance literature heavily emphasizes incentives, information interpretation, trend chasing, fees, and the skill of managers. These studies provide insight on different mechanisms that cause investors to overpay for funds and how this translates into fees. Fernandes et al. (2010) find that managers are more likely to take excessive risk to earn a positive return if the previous period's return was subpar[6]. This suggests that managers may feel protected by reporting standards and the fee structure of their fund if they can take excessive risk with confidence. Alternatively, Gennaioli et al. (2015) would argue that this result is explained by investors' trust in managers. More trustworthy investors are vulnerable to this moral hazard due to managers' tendency to pander to investors' beliefs. The theme of moral hazard in financial literature has gained popularity following the 2008 crisis when these issues were brought to the forefront.

Investors' allocation of funds can be attributed to poor interpretation of the prediction of future returns from past returns (Berk and Green, 2004), stale information, return chasing behavior and reporting standards (Philips et al., 2014).[7] These biases are reinforced by managers who pander to investors' incorrect beliefs, as Gennaioli et al. (2015) explain. This effect is even

[6] This finding is confirmed by Li and Tiwari (2009), and Golec and Starks (2004).
[7] Berk and Green (2004) posit that the competitive allocation of capital to funds produces conditions that make manager performance ambiguous. Philips et al. (2014) argue that investors cannot distinguish stale from new information, leading managers to pander to clients' beliefs, causing them to overpay.

more pronounced in hot asset classes where managers can charge higher fees for pandering to investors' incorrect beliefs on the asset's fundamental value. Galbraith (1993) examines trend chasing as a means for departure from net asset value.[8] Investors that hold incorrect beliefs about the fundamental value of an asset are vulnerable to managers complying with their preferences for the over-valued asset. Importantly, these authors echo the sentiment that clients are overpaying for the returns that they receive in addition to reiterating the Gennaioli et al. (2015) result that managers pander to investor beliefs.

Guiso et al. (2008) determine that investors who trust financial advice more will buy an increasing numbers of stocks based on that advice. The authors collected data tailored to this topic by surveying individuals about their perceptions of trust in finance. A key implication of their work is to conclude definitively that trust is not a proxy for attitudes towards risk. This compliments the model used in this paper by conforming to the consensus that trust is quantifiable and plays a major role in individuals' investment decisions. Furthermore, the role of trust in biasing investors' perceptions of the risk of financial products is reinforced.

Georgarakos and Inderst (2011) also use micro data to measure individuals' trust for managers. They find that households with relatively low financial capability choose their managers based on trust. This is in contrast to highly financially capable households that do not consider the trustworthiness of managers in choosing investments; but instead consider their legal protection in the financial market. Differentiating between different types of investors in the analysis is necessary to account for this. Since institutional mutual funds have value conditions for fund entrance, examining them in relation to retail funds will shed light on this notion. This compliments the Gennaioli et al. (2015) theory by bolstering their hypothesis regarding the validity of trust in investment decisions.

[8] Avery and Zemsky (1998) and Alti et al. (2012) also discuss this issue.

The most insightful piece of literature on this topic is Gennaioli et al. (2015). Transactions on both the investor and manager side are considered in the authors' model. The authors posit that clients are willing to overpay underperforming managers to choose investments for them because it lowers their anxiety. The authors hypothesize that the level of trust clients have for managers is positively related to the markup of fees charged. Investors who have a high level of trust in their managers will pay fees above cost. This results in managers pandering to investors' beliefs, causing a decline in competitiveness between mutual funds since managers can charge higher fees without the loss of investors. Clients are acquired through a combination of personal relationships, familiarity, persuasive advertising, connections to friends and colleagues, communication and schmoozing[9]. A central implication of the model is that managers do not have an incentive to correct clients' misperceptions about their performance and they exploit these beliefs to extract returns. This implies that managers who charge relatively higher fees have more trusting clients. This model is used for the analysis in proceeding sections where it is applied to mutual fund data to investigate the level of trust.

Regarding investors, Gennaioli et al. (2015) posit that those who trust their mutual fund managers are willing to overpay for the level of risk assumed. Investors decide whether or not to invest in risky assets based on the availability of good financial advice.[10] Trustworthy managers lower investors' perception of the fund's riskiness, lowering their expectations for future returns. Therefore, investors overpay for the actual level of risk and returns associated with their investment. The authors derive a measure of trust based on this theory. The difference between expected return and actual return is a trust premium earned by managers. Investors who trust mutual funds with their capital are taking the past returns on stocks, combined with manager

[9] See Gennaioli et al. (2012), pp. 3.
[10] See Georgarakos and Inderst (2011).

strategy, and market trends as an indication of potential expected returns. Adding trust to this will cause investors to deviate from current models of expected returns, paying managers more than required for a given level of risk in an investment. This effectively rotates the expected return curve downward.

Prior literature clearly indicates a dichotomy between managers and investors, characterized by incentives. Managers are driven to earn more fees, even if it means complying with investors' wishes to chase a trend that may be detrimental in the long run. There is a consensus among researchers that investors consistently overpay managers for the returns that they receive. There is disagreement in the literature as to how this departure is justified. Building off of Gennaioli et al. (2015), the next section examines the role that trust plays in this departure.

III. Data and Methodology

This section first discusses a comparative analysis of mutual funds to gather topical evidence on the trust matter before looking at the validity of the proposed quantitative measure for trust in the context of the Fama-French model, followed by the Moskowitz et al. value and momentum model. Previous research regarding trust exclusively deals with micro data from surveys to ascertain a measure of trust. The following analysis uses panel data for mutual funds with the measure of trust being the difference between expected return and actual return. Data on NASDAQ mutual funds is taken from the CRSP, accessible through the WRDS database, for January 2008 – December 2009. Due to the nature of some integral variables only being available on a quarterly basis, all data is tailored to this standard. This is done for the entirety of the CRSP database, representing 24367 NASDAQ mutual funds.

Excess return is taken as the fund's actual return minus the market's return on the S&P 500. Using this measure to compare excess returns across mutual funds avoids pitfalls in the analysis. The issue of the potential for an arithmetic linkage between high expense ratios and low net excess returns is recognized and dealt with thoroughly. To avoid the problem of working with arithmetically linked high expense ratios and low net excess returns that measure trust, expense ratio fees are never deducted from excess returns and the expense ratio sorting mechanism is used. This validates the expense ratio group sorting method employed in this analysis and allows for the comparison of excess returns across these groups, without biasing returns by deducting fees in addition to sorting them by a fee criterion. Funds are not sorted by net excess return levels, allowing an unbiased level of trust to be inferred from the expense ratio groups. Funds are sorted by expense ratio groups and the level of excess return within them is related to the Gennaioli et al. measure of trust. Alternatively, funds that are divided by excess returns levels are compared using trust. Although trust is calculated as expected return minus actual return, this does not imply that funds with the same returns will have the same level of trust, since their expected returns are different. This emphasizes the importance of data sorting by expense ratios, frequently used in this analysis. A key result of the upcoming analysis is that funds with the same expense ratios do not have the same excess returns; therefore, a given level of excess returns does not always imply the same level of trust.

(i) Evidence on the relationship between expense ratios, excess returns, and trust

The Gennaioli et al. (2015) model dictates that more trustworthy funds are able to charge higher fees without losing investors. This is explainable if investors trust their managers enough to lower their expectations of future returns. To find evidence on this phenomenon, the data is divided according to expense ratios. The expense ratio includes management fees and operating costs and can be negative due to reimbursements. The expense ratio is expressed as a fraction of the total investment that shareholders pay for the fund's operating expenses.

The funds are divided according to high and low expense ratios in order to examine each group's excess returns more closely. The data is sorted according to quarters and then the funds with expense ratios that lie above each quarter's median expense ratio are separated from those that lie below. The excess return is averaged for each expense ratio group in each quarter. Gennaioli et al. posit that if the difference between excess returns and fees is relatively small, then those investors must trust their managers more because their managers can charge higher fees. To test this, the mean excess return in each quarter is computed for funds that lie above the expense ratio median and those that lie below. The difference in mean excess returns for each quarter between high and low expense ratio groups is statistically significant. This is consistent with the model that relates a relatively high expense ratio to more trusting clients who are prepared to accept lower excess returns. Quarter one, three and four in 2008 and quarter one in 2009 represent periods where excess return is higher for funds with lower expense ratios. This evidence supports the Gennaioli et al. theory that relates a higher expense ratio to investors' lowered perception of risk, making a lower return acceptable for them. Notably, these results do not stand during the second quarter of 2008 when the crisis began, or further into 2009 when the recovery started. Each group is examined closely to isolate its fluctuations in returns during the crisis.

The mean excess return within each expense ratio group is tracked for each quarter. In the low expense ratio group, the mean excess return declines in each quarter except for quarter three and four of 2008 and quarter four of 2009. A decline in excess return for this group would be aligned with increased manager trust, Gennaioli et al. (2015) argue. This is curious since the last quarter 2008 represents a time of considerable turmoil for the financial system. However, declining excess return in 2009 is inconsistent with a decrease in trust that would be likely to occur following the crisis. It is likely that there are unaccounted factors at play here; this is examined in the upcoming analysis section.

For the high expense ratio group, the mean excess return decreased significantly for quarter three in 2008 and quarters two, three and four in 2009. The overall story for the high expense ratio group is hypothesized to be that after the height of the crisis, in the fourth quarter of 2008, trust in those managers decreased and investors required a higher return, explaining the increase in mean excess return from quarter three to four in 2008. In 2009, excess returns consistently declined starting in the second quarter. This is inconsistent with a decrease in investor trust for their managers following the crisis, according to the Gennaioli et al. (2015) theory. These results define the beginning of a separation between low and high expense ratio groups and the excess returns that each group receives, mediated by trust. The inconsistencies in results obtained are accounted for in the upcoming analysis.

Co-movement in the expense ratio and excess returns is tracked for each quarter. Over the two years of data, expense ratio and excess returns are negatively correlated as Gennaioli et al. predict. In order to find more concrete evidence that the level of trust that investors have for managers is causing the differences in excess returns between expense ratio groups, further investigation is required. For the high expense ratio group, excess returns and expense ratio are more negatively correlated than the low expense group that retains a less-negative correlation. This is explainable by the lowered perception of risk that the high expense ratio group has for managers that translates into trust. The high expense ratio group’s correlations are always negative, except for quarter two and four in 2009, fluctuating sporadically; they do not conform to an observable trend. Alternatively, the low expense ratio group displays positive correlations in half of the quarters. In 2009, the correlation becomes positive in the second quarter and remains positive for the duration of the year. The Gennaioli et al. model would posit that investors in this group do not trust their managers and therefore would require a higher excess return to justify an increase in fees. This is preliminary evidence on co-movement between the two variables; this warrants an examination of the variables in the context of the Fama-French and Moskowitz et al. model in the next section.

Co-movement in the expense ratio and trust is found to be positive for the duration of 2008 and negative for the duration of 2009. These results are consistent with the Gennaioli et al. theory of trust, considering the events that took place during this timeframe. In 2009, following the height of the financial crisis, investors' trust for their fund managers decreased in relation to the expense ratio, producing negative co-movement between the two variables.

Using the proposition that trust, manifesting as a lower perception of risk, is the deviation of actual return from expected return, the expense ratio groups are compared. Expected return is taken as the actual return, twelve months prior to the current date, and is tailored to be quarterly. Tests reveal that this measure of trust for the low expense ratio group is lower than the high expense ratio group in every quarter in 2008 while the opposite is true in 2009. The 2008 results partially align with the higher excess return for the low expense ratio group found above, except for quarter two, when the high expense ratio group has a higher mean excess return. For 2009, the excess return results only contradict these for the first quarter. The excess return for the low expense group was only higher than the high expense group in the first quarter of 2009; the trust results suggest that the excess returns for the low expense ratio group should have been lower than the high expense group for the duration of 2009. Considering fund characteristics more closely may shed light on these inconsistencies.

A closer look at each expense ratio group is considered in order to bolster the Gennaioli et al. theory. Institutional funds are considered in the group context. In contrast to retail funds, institutional funds typically have relatively low management fees but require a higher initial capital investment in the fund. The case of institutional versus retail funds provides a unique opportunity to analyze trust in the context of different types of investors.

For the overall sample, retail funds have a significantly higher mean expense ratio than institutional funds. One explanation for this could be that retail investors are less qualified to evaluate different funds and must choose their funds based on a combination of trust and past performance, which, as discussed previously, may lead to a biased view of the fund. This would result in retail investors accepting higher fees for the reduction in their anxiety that a trustworthy manager induces. Institutional investors may be more apt at evaluating mutual funds and therefore do not let manager trust influence their choices as much as retail investors would. Their perceptions of risk associated with fund managers may be more accurate due to experience in the industry. Following the Gennaioli et al. theory, this would lead to the differential in fees observed. Ultimately, tests reveal that the same discrepancy between expense ratios translates into trust, as observed as before. Institutional funds trust their managers less and have lower expense ratios than their counterpart, retail funds.

Gennaioli et al. argue that given multiple funds with the same expense ratio, those that earn lower returns have more-trusting clients. Holding the expense ratio constant, excess returns are compared within each expense ratio group. After excess returns are sorted into groups of funds with the same expense ratio, the mean excess return of each group is computed. Within each expense ratio group, the average excess returns earned by funds below the group average and above the group average are found to be different for several funds. Some of these differences are insignificant, however, and conform to the theory that a given expense ratio implies equal excess returns across firms. For funds with the same expense ratio that earn different returns, Gennaioli et al. posit that funds with relatively lower returns in this context have more trusting investors. This result is obtained for multiple funds examined. The next section examines this more closely by accounting for the other factors that can bias excess returns.

(ii) Trust in an expected return context

(a) Fama-French model

A more direct approach to finding the level of trust for mutual funds draws on expected return theory. The Fama-French (1993) model of expected returns builds off of CAPM to introduce additional explanatory factors for expected returns. To account for the observation that equity investment in smaller-capitalization firms usually outperforms large ones, “SMB” is introduced as the difference in average returns on three low market capitalization stock portfolios and three high market capitalization ones. This represents whether or not the strategy of the portfolio manager is to invest in smaller firms to earn higher than average returns.[11] The authors also introduce “HML” as the average return on value stock portfolios minus the average return on growth stock portfolios. Since value stocks produce higher returns than growth stocks that have a lower book-to-market ratio, a fund that is earning higher than average returns may be

[11] See Fama and French (1993).

explained by this factor.[12] The last factor included is the excess return on the value-weighted market index, using the risk-free rate.

To integrate this model with the Gennaioli et al. (2015) context, the deviation from expected return to actual return that the authors attribute to a measure of trust is computed. This represents the lowered perception of risk that trustworthy managers induce in clients. Evidence taken from the analysis done above is used to justify the authors' position that higher fees imply lower excess returns, before fees are netted out, representing more trusting clients. This is explored in detail using the Fama-French approach.

Daily returns for the mutual funds are obtained along with the risk-free interest rate, taken as the one-month Treasury Bill rate. The returns are tailored to quarterly frequency to match expense ratio data; the mean excess return over each quarter is taken. The excess return on the market is measured as the value-weighted return on all NYSE, AMEX, and NASDAQ stocks, from the CRSP, minus the one-month Treasury bill rate. The Fama-French factors are taken from WRDS. One of the challenges in using quarterly data to look at the events surrounding the 2008 crisis is that the number of observations are limiting; there are insufficient observations to produce precise results on a quarterly basis. This challenge is partially overcome by examining funds with different characteristics in detail while not being able to look at changes in them leading up to and following the crisis.

Looking at all the data first, including the expense ratio in the regression over the sample produces statistically significant results with an explanatory power of 26.38%. Running the Fama-French regression alone produces an explanatory of 26.19%. Funds with the same expense ratio are compared for expected returns in a Fama-French context. For the high expense ratio group, the model has a negative expense ratio coefficient of magnitude 0.523 and the model

[12] See Fama and French (1993).

returns an explanatory power of 28.72%. For the low expense ratio group, the model returns a negative coefficient of magnitude 4.359 with an explanatory power of 23.67%. While the model returns a coefficient on expense ratio that is negatively related to expected returns, the relative magnitudes do not confirm the hypothesis of Gennaioli et al. (2015). The expectation is to discover that the high expense ratio group's returns are more negatively impacted than the low expense ratio group's returns.

Looking at the high expense ratio group, regressing expected return on the standard Fama-French factors produces a model with an explanatory power of 28.56%; including expense ratio as a proxy for trust increases the explanatory power to 28.72%. For the low expense ratio group, including expense ratio in the regression increases the explanatory power from 23.22% to 23.67%. Although the model explains more variation in expected returns for the high expense ratio group, including the expense ratio in the regression increased the explanatory power of the low expense ratio group's model by a larger fraction. Looking at the difference in expense ratios by type of fund is also examined.

The case of institutional versus retail funds is considered in the Fama-French framework. The institutional funds' model has an overall explanatory power of 26.81%. This is expected as both low and high expense ratio groups are represented in this sample; this number is within the range predicted in the first part of the analysis. Looking at only the high expense ratio group in the institutional context, the model explains 33.31% of the variation in expected return. This is higher than the overall institutional sample in addition to the portion of the sample that has an exclusively high expense ratio, with an explanatory power of 33.00% when expense ratio is not included as an independent variable. The low expense ratio group for institutional funds produces a model that explains 24.32% of variation in expected returns with the expense ratio included, higher than the 24.10% when expense ratio is not included in the model for this group.

Applying the same model to the entire sample of retail funds yields an explanatory power of 25.97%. Including only high expense ratio funds increases the explanatory power of the model to 27.73%, higher than taking the model alone with high expense funds and not including the expense ratio factor. Similarly, looking at the low expense ratio group, expected return is better-predicted when expense ratio is included in the group. The explanatory power of the model increases from 22.53% to 23.39%. Overall, the model explains institutional funds' expected returns better than retail funds'. Due to limitations with the number of observations around the 2008 crisis, an analysis on a quarterly basis is ruled out. However, the coefficient on expense ratio is both negative and significant in all cases. This is strong empirical evidence of the Gennaioli et al. model, relating higher expense ratios to more trustworthy managers, a lowered perception of risk, and consequentially, lower expected returns for clients before fees are netted out. The evidence on how this model performs in the context of low and high expense ratio groups, however, does not confirm the authors' hypothesis in terms of the relative magnitudes of the expense ratio coefficients.

Looking at the latter regressions in the context of funds sorted by levels of trust may be enlightening. Using the sorting process discussed above for funds with the same expense ratio, the funds that are considered relatively more trustworthy based on the Gennaioli et al. model are compared to the relatively less trustworthy ones. Of the funds that are considered more trustworthy, the model explains 17.11% of the variation in expected returns and 57.41% in the less trustworthy group. This implies that funds with higher excess returns relative to the more trusting group have returns that behave in a more predictable manner. This is in contrast to the results discussed above where the model performed better in the high expense ratio context that is considered the more trusting group. The Gennaioli et al. theory would relate this finding to the information flow between clients and managers that less-trusting clients expect from their managers. With more information, expected returns become more predictable; the moral hazard problem associated with financial managers is partially alleviated. This theory cannot be tested further leading up to the 2008 financial crisis as the number of observations in the data does not permit it. Examining the Gennaioli et al. theory in the context of another expected return model will either bolster or cast doubt on these results, some of which conform to authors' hypothesis.

(b) Value and momentum model

The Moskowitz et al. (2011) model documents the "time series momentum" aspect that portfolios display. Their three-factor model takes into account the asset's book value relative to its market value and the asset's "momentum", represented by the recent relative performance of the asset. The co-movement across asset classes that is documented is related to a common global risk factor that affects value and momentum. The authors' third factor is a global market index. Instead of examining a cluster of assets in a market, the authors examine individual securities in several markets at once. This is in contrast to this study that focuses solely on mutual funds. Since mutual funds are not valued in the same way as securities, they are always taken at current, market value, a mutual fund's book value will equal its market value. If access to individual fund's portfolios was available, this would give a possible indication of book value by examining past returns over a long period of time. Momentum is taken as the sum of the previous twelve months' returns, less the most recent month's return, a standard measure in financial literature. Instead of using a world market index to represent the common risk factor in the mutual fund sample, the excess return on the S&P 500 is used as a benchmark to align with the nature of the sample.

Including the expense ratio in this model increases the explanatory power of the Moskowitz et al. model from 6.18% to 6.49% for predicting expected returns. The coefficient is negative on expense ratio, as Gennaioli et al. posit. This is good evidence to pursue a more rigorous analysis in the momentum context. The funds are analyzed on the basis of fees. In both the low and high expense ratio groups, including expense ratio in the regression specification increases the explanatory power of the model. The results conform to the ones found in the Fama-French context where expense ratio has a negative coefficient, implying lower expected returns, gross of fees, with higher fees. Expense ratio represents the investors' perceived level of risk reduction with a trustworthy manager. The high expense ratio group's model has a higher explanatory power than the low expense ratio group's. This is aligned with the Fama-French results discussed above under the same sorting mechanism. Under the Gennaioli et al. theory, this implies that higher expense ratio groups, with more risk-taking managers, may have predictably lower returns relative to the less trusting low expense ratio group that require more disclosure from their managers.

Looking at funds defined to be either low or high trust funds based on their positions from the mean level of return for a given expense ratio, it can be determined if the results represent a Gennaioli et al. outcome. The results indicate that the low trusting group's model is less explanatory than the high trusting funds' with the former having an explanatory power of 4.71% while the latter group's is 6.92%. These results are in contrast to the Fama-French results. The coefficient on expense ratio is more negative for the less-trusting fund group. This is also in contrast to the Gennaioli et al. theory that would predict that more-trusting clients would have expected returns more adversely impacted by expense ratio. This contradicts the outcome when the sorting mechanism is to look at the high and low trust groups in the entire sample, and the result is that low expense ratio funds earn higher excess returns than high expense ratio funds.

For institutional funds, the explanatory power of the model without expense ratio as an independent variable is 6.25%. Including expense ratio in the regression increases this to 6.80%. Similarly, including expense ratio for high expense ratio institutional funds increases the explanatory power of the model from 6.29% to 7.33%. For the low expense ratio institutional fund group, including expense ratio increases the explanatory power of the model from 5.83% to 6.26%. The coefficient on expense ratio is more negative for the low expense ratio group. This is the same result, discussed above, that does not compliment the Gennaioli et al. theory. According to the authors, the high expense ratio group should have more-negatively affected returns due to clients' lowered perception of risk as a byproduct of trustworthy managers.

The explanatory power of the model for the entire data sample also increases when expense ratio is included in the retail fund case. The Fama-French result is echoed here where the model better explains institutional returns. The explanatory power of the retail fund model increases from 6.11% to 6.47% when the expense ratio is included; both are lower than their institutional fund counterparts discussed above. Both the high and low expense ratio group models are improved with the inclusion of expense ratio as an independent variable. The result that the low expense ratio group's returns are more negatively impacted by expense ratio persists in this context. A possible way of interpreting this persistent result is that a unit increase in expense ratio is more detrimental to the low expense ratio group's returns due to their less-trusting nature. Perhaps less-trusting individuals are more likely to be risk averse and therefore if a higher expense ratio implies taking more risks for them, this weighs heavily on their expectations for earning a return in the future.

IV. Implications

This analysis found evidence that sheds light on the investor psychology behind why clients accept lower returns for a given level of risk. Specifically, empirical evidence is found that aligns with the Gennaioli et al. hypothesis on the relationship between investors' excess returns and their level of trust for fund managers. The key variables that Gennaioli et al. determine are related to a measure of trust for investors' fund managers are found to be correlated throughout the business cycle and during the 2008 financial crisis.

The first part of the analysis established that for the majority of 2008 and the beginning of 2009, low expense ratio funds had higher excess returns than those with relatively higher expense ratios. This result is consistent with the Gennaioli et al. model whereby a higher expense ratio translates into more trusting clients with a lowered perception of risk that allows fund managers to earn lower excess returns for them. The periods where funds with relatively high expense ratios earn higher excess returns than low expense ratio funds do not conform to the authors' model. Mean excess return for the low expense ratio group declined significantly on a quarterly basis except for quarter four in both 2008 and 2009, while for the high expense ratio group, excess return increased for quarters two and four in 2008 and quarter one in 2009. This is not explained by the model but may be a sign of the uncertainty that accompanied the 2008 crisis. Allowing time for investors' attitudes towards their managers to adjust is crucial. For the high expense ratio group, it is likely that, following the crisis, investors demanded performance that aligned with the actual, instead of perceived level of risk that comes with a trustworthy manager, increasing returns in the relevant periods. The same logic applies to the low expense ratio group. However, since this group has expectations aligned with the actual level of risk of the investment, the change in excess return was less pronounced for this group than for the high expense ratio group.

Furthermore, co-movement in the expense ratio and excess returns is found to be negative as predicted by the model. An increasing expense ratio is only sustained if clients trust their managers more and therefore are willing to accept lower returns. Co-movement between these variables is less reliable as confirmation of the authors' model, however, since within expense ratio groups, the excess returns are not correlated with movement in the expense ratio as predicted by the theory. This is especially pronounced for the low expense ratio group where, in 2009, co-movement between the expense ratio and excess returns became positive. This may be a sign that investors required higher returns following the crisis, especially for an increase in the expense ratio in the low trusting group.

Looking directly at trust in relation to movement in the expense ratio, the results align with the Gennaioli et al. theory for 2008 where the variables are positively correlated. However, in 2009, this relationship becomes negative. Perhaps this change represents investors' changing attitudes toward their fund managers following the economic turmoil of 2008, consistent with a decline in trust.

Further analysis indicates that the authors' measure of trust is consistent with expense ratio levels for 2008. For the entire year, funds with higher expense ratios are more trusting, compared to lower expense ratio funds. This trend flips for the duration of 2009 and higher expense ratio funds become less trusting than lower expense ratio ones. Gennaioli et al. would explain this by saying that more-trusting clients became aware of the excessive risk taking by their managers subsequent to the 2008 crisis and demanded higher returns for the funds in light of this new information.

Looking at the data in greater depth entailed dividing it by type of fund in addition to expense ratio. For a given expense ratio, some funds earn significantly different returns for their clients. This is consistent with the Gennaioli et al. theory that would dictate that funds with the same expense ratio should earn different returns based on trust. Further analysis showed that retail funds have higher expense ratios than institutional funds on average and also have higher trust on average. These differences did not persist into excess returns, however. Funds with the same expense ratios were found to have significant differences in excess returns; this translated into the authors' measurement of trust.

Integrating a trust-related variable into expected return models showed the need for the consideration of investor psychology in greater depth for determining expected returns. Adding an expense ratio term that was confirmed to be positively related to trust in the previous analysis done increased the explanatory power of both the Fama-French and Moskowitz et al. models. In both contexts, including expense ratio as a proxy for trust results in a negative impact on expected return. This conforms to the Gennaioli et al. model. Although several pieces of evidence collected suggest that the authors' theory is sensible, some results are to the contrary. As discussed above, the magnitude of the negative coefficient on expense ratio was found to be larger for the low expense ratio group. This contradicts the authors' intuition whereby a low expense ratio implies less trust and higher excess returns, relative to funds with higher expense ratios that will accept lower excess returns.

The model performs better for institutional funds rather than retail funds in terms of explanatory power. The results indicate that including expense ratio as a proxy for trust in the regression specification marginally increases its explanatory power. Including expense ratio is particularly beneficial to the analysis of groups that are low or high trust based on their expense ratio level. For the less-trusting group, the model's explanatory power is dramatically increased in the Fama-French context. It is possible that the less trustworthy group's returns are more predictable due to information disclosure between managers and clients in this group. On the other hand, the high expense ratio group responds positively to pandering by fund managers that lowers their perception of funds' riskiness. This makes their expected returns more unpredictable.

Applying trust to the Moskowitz et al. value and momentum model also produced results that indicate that expense ratio is related to expected returns. Including expense ratio in the regression specification increased the explanatory power of the model in every case and provided evidence on the negative relationship between the latter and expected returns. This model explains the high-trusting group's returns better than the less-trusting group's. This can be attributed to the flow of information between clients and their managers that is reduced when clients are more trustworthy, making returns less predictable.

Overall, a mix of evidence is found on the Gennaioli et al. model. There is a definitive connection between trust, implied by expense ratio, and excess returns for mutual funds. Some evidence suggests that trust declined following the 2008 financial crisis. Data limitations have made it difficult to consider this concept in detail. Preliminary evidence collected in the first part of the analysis where trust was tracked by expense ratio groups leading up to and following the crisis indicates a shift in investors' attitudes toward their managers. The need for expected return models to take into account investors' levels of trust is overwhelming, based on the results obtained in the Fama-French and Moskowitz et al. contexts. A model that heavily emphasizes investor psychology taking into account reactions to major events is a direction for further analysis. Examining the authors' measure of trust around several informational events will provide a greater understanding on whether or not trust plays a significant role in determining expected returns for mutual funds following significant economic announcements and events.

V. Conclusion

There is a consensus in financial literature on the importance of trust in a well-functioning financial system. Given this, there is a need for more concrete evidence on how trust plays into interactions between agents and how this shapes outcomes. Evidence obtained in this analysis both favors the Gennaioli et al. model and contradicts it. The majority of evidence obtained, however, is explained by investors' shifting attitudes toward their managers during the 2008 crisis, aligning with the authors' theory.

The authors' propositions on the negative relationship between expense ratio and excess returns, and the positive relationship between trust and expense ratios, are confirmed in several intervals through correlations, and comparative analysis of funds with different expense ratios and levels of trust. Evidence on the decline in trust following the 2008 crisis was obtained by tracking excess returns through different expense ratio groups in time in addition to examining the co-movement of trust with expense ratio. High expense ratio funds are found to have relatively more trusting clients and earn lower returns on average than low expense ratio funds. Retail funds are found to be more trusting and have higher expense ratios on average, compared to institutional funds. Differences in returns to funds with the same expense ratios are evidence of the Gennaioli et al. trust differential.

These results are strengthened by the Fama-French and Moskowitz et al. model outcomes that confirm the need for a trust variable in evaluating expected returns. The results indicate that less trusting funds' returns are more predictable than their more trusting fund counterparts in the Fama-French context. This is consistent with less trusting investors demanding more information from their managers while more trusting investors respond to pandering as the authors posit, making them vulnerable to uncertainty in returns. The contrary is true in the Moskowitz et al. context. These results are echoed in the institutional fund context, where the funds' returns are more predicable than the relatively more trusting retail funds' returns. This analysis has provided definitive empirical evidence on the Gennaioli et al. (2015) model that is mediated by trust.

Works Cited

Altı, Aydoğan, Ron Kaniel, and Uzi Yoeli. "Why Do Institutional Investors Chase Return Trends?" *Journal of Financial Intermediation* 21.4 (2012): 694-721. Web.

Asness, Clifford S., Tobias J. Moskowitz, and Lasse H. Pedersen. "Value and Momentum Everywhere." *The Journal of Finance* 68.3 (2013): 929-85. *JSTOR*. Web. June 2015.

Avery, Christopher. "Multidimensional Uncertainty and Herd Behavior in Financial Markets." *The American Economic Review* 88.4 (1998): 724-48. *JSTOR*. Web.

Berk, Jonathan B., and Jules H. Van Binsbergen. "Measuring Skill in the Mutual Fund Industry." *NBER Working Paper No. W18184* (2013): n. pag. *SSRN*. Web.

Berk, Jonathan B., and Richard C. Green. "Mutual Fund Flows and Performance in Rational Markets." *Journal of Political Economy* 112.6 (2004): 1269-295. Web.

Black, Fischer. "Estimating Expected Return." *Financial Analysts Journal* 49.5 (1993): 36-38. Web.

Carhart, Mark M. "On Persistence in Mutual Fund Performance." *The Journal of Finance* 52.1 (1997): 57-82. *JSTOR*. Web. June 2015.

Cornell, Bradford. "Luck, Skill, and Investment Performance." *The Journal of Portfolio Management* 35.2 (2009): 131-34. Web.

Eley, Jonathan. "Best of 2014- Farewell to the Fund Manager?" *Financial Times*. N.p., 10 Oct. 2014. Web.

Fama, Eugene F., and Kenneth R. French. "Common Risk Factors in the Returns on Stocks and Bonds." *Journal of Financial Economics* 33.1 (1993): 3-56. Web.

Fama, Eugene F., and Kenneth R. French. "A Five-factor Asset Pricing Model." *Journal of Financial Economics* 116.1 (2015): 1-22. Web.

Fama, Eugene F., and Kenneth R. French. "Size, Value, and Momentum in International Stock Returns." *Journal of Financial Economics* 105.3 (2012): 457-72. Web.

Fama, Eugene F., and Kenneth R. French. "Luck versus Skill in the Cross-Section of Mutual Fund Returns." *The Journal of Finance* 65.5 (2010): 1915-947. Web.

"Fees for Hedge Funds and Private Equity: Down to 1.4 and 17." *The Economist*. N.p., 8 Feb. 2014. Web.

Fernandes, José Luiz Barros, Juan Ignacio Peña, and Benjamin Miranda Tabak. "Delegated Portfolio Management and Risk-taking Behavior." *The European Journal of Finance* 16.4 (2010): 353-72. Web.

Foley, Stephen. "Trend Is Your Friend, Say Investors Flocking to Futures." *Financial Times*. N.p., 20 Apr. 2015. Web.

Frazzini, Andrea, David Kabiller, and Lasse H. Pedersen. "Buffett's Alpha." *SSRN, NBER Working Paper No. W19681* (2013): n. pag. Web.

"Fund Managers: Assets or Liabilities?" *The Economist*. N.p., 2 Aug. 2014. Web.

Galbraith, John Kenneth. *A Short History of Financial Euphoria*. New York, NY: Whittle in Association with Viking, 1993. Print.

Gennaioli, Nicola, Andrei Shleifer, and Robert Vishny. "Money Doctors." *The Journal of Finance* 70.1 (2015): 91-114. Web.

Gennaioli, Nicola, Andrei Shleifer, and Robert W. Vishny. "Money Doctors." *NBER Working Paper No. 18174* (2012): n. pag. Web.

Georgarakos, Dimitris, and Roman Inderst. "Financial Advice and Stock Market Participation." *European Central Bank Working Paper 1296* (2011): n. pag. Web. June 2015.

Golec, Joseph, and Laura Starks. "Performance Fee Contract Change and Mutual Fund Risk." *Journal of Financial Economics* 73.1 (2004): 93-118. Web.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales. "Trusting the Stock Market." *The Journal of Finance* 63.6 (2008): 2557-600. *JSTOR*. Web. 05 Aug. 2015.

Habib, Michel A., and D. Bruce Johnsen. "The Quality-Assuring Role of Mutual Fund Advisory Fees." *George Mason University Law and Economics Research Paper Series* (2015): n. pag. *SSRN*. Web.

"Hedge Funds: Going Nowhere Fast." *The Economist*. N.p., 22 Dec. 2012. Web.

"How Hedge Funds Work." *The Economist*. N.p., 30 Mar. 2015. Web.

Kosowski, Robert, Allan Timmermann, Russ Wermers, and Hal White. "Can Mutual Fund "Stars" Really Pick Stocks? New Evidence from a Bootstrap Analysis." *The Journal of Finance* 61.6 (2006): 2551-595. Web.

Li, C. W., and A. Tiwari. "Incentive Contracts in Delegated Portfolio Management." *Review of Financial Studies* 22.11 (2009): 4681-714. Web.

Moskowitz, Tobias, Yao Hua Ooi, and Lasse Heje Pedersen. "Time Series Momentum." *Initiative on Global Markets The University of Chicago, Booth School of Business* (2011): n. pag. *SSRN*. Web.

"Mutual Funds: Mutton Dressed as Lamb." *The Economist*. N.p., 18 Feb. 2015. Web.

O'Hara, Clare. "Canada's Mutual Fund Companies Keep Cutting Management Fees, Report Says." *The Globe and Mail*. N.p., 5 Apr. 2015. Web.

Phillips, Blake, Kuntara Pukthuanthong, and P. Raghavendra Rau. "Past Performance May Be an Illusion: Performance, Flows, and Fees in Mutual Funds." (2014): n. pag. *SSRN*. Web.

"The Origins of the Financial Crisis: Crash Course." *The Economist*. The Economist Newspaper, 07 Sept. 2013. Web. July 2015.

Remolona, Eli M., Paul Kleiman, and Debbie Gruenstein. "Market Returns and Mutual Fund Flows." *FRBNY Economic Policy Review* (1997): n. pag. Web.

"Understanding Risk and Return, the CAPM, and the Fama-French Three-Factor Model." *Tuck School of Business at Dartmouth* 03-111 (2003): n. pag. *SSRN*. Web.

Tables:

(i) Evidence on the relationship between expense ratios, excess returns, and trust

Tables 1-8 present evidence on excess returns being higher for the low expense ratio group for quarter one, three and four in 2008, and quarter one in 2009. Under the "group" label in each table, the single digit label refers to the low expense group for that quarter and the double digit label refers to the high expense ratio group for that quarter. The quarters are labeled in chronological order from 1-8.

Table 1: Quarter one, 2008

```
. ttest excess if low_exp==11 | low_exp==1, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
1	10,266	.018025	.0001912	.0193758	.0176501	.0183998
11	10,558	.0072226	.0002068	.0212464	.0068173	.007628
combined	20,824	.0125481	.0001459	.0210499	.0122622	.012834
diff		.0108023	.0002816		.0102503	.0113544

```
    diff = mean(1) - mean(11)                                     t =  38.3542
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20737.2

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 2: Quarter two, 2008

```
. ttest excess if low_exp==22 | low_exp==2, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
2	10,405	.0090456	.000124	.012653	.0088025	.0092888
22	10,510	.0102472	.0001636	.0167759	.0099264	.010568
combined	20,915	.0096494	.0001029	.0148802	.0094478	.0098511
diff		-.0012016	.0002053		-.0016041	-.0007991

```
    diff = mean(2) - mean(22)                                     t =  -5.8517
Ho: diff = 0                     Satterthwaite's degrees of freedom =  19539.5

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 3: Quarter three, 2008

. ttest excess if low_exp==33 | low_exp==3, by(low_exp) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
3	10,536	.0054184	.0002543	.0261016	.0049199	.0059168
33	10,637	-.0081836	.0003214	.033149	-.0088136	-.0075536
combined	21,173	-.0014151	.0002104	.0306151	-.0018275	-.0010027
diff		.013602	.0004098		.0127987	.0144053

diff = mean(3) - mean(33)   t = 33.1886
Ho: diff = 0   Satterthwaite's degrees of freedom = 20148.4

Ha: diff < 0   Ha: diff != 0   Ha: diff > 0
Pr(T < t) = 1.0000   Pr(|T| > |t|) = 0.0000   Pr(T > t) = 0.0000

Table 4: Quarter four, 2008

. ttest excess if low_exp==44 | low_exp==4, by(low_exp) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
4	10,994	.0343386	.0004027	.0422251	.0335492	.0351279
44	11,006	.0115733	.0003931	.0412419	.0108028	.0123439
combined	22,000	.0229497	.0002917	.0432596	.0223781	.0235214
diff		.0227652	.0005628		.0216621	.0238683

diff = mean(4) - mean(44)   t = 40.4516
Ho: diff = 0   Satterthwaite's degrees of freedom = 21984.6

Ha: diff < 0   Ha: diff != 0   Ha: diff > 0
Pr(T < t) = 1.0000   Pr(|T| > |t|) = 0.0000   Pr(T > t) = 0.0000

Table 5: Quarter one, 2009

. ttest excess if low_exp==55 | low_exp==5, by(low_exp) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
5	10,768	.0228715	.0002304	.0239131	.0224197	.0233232
55	10,802	.0158156	.0002637	.0274065	.0152987	.0163325
combined	21,570	.019338	.0001768	.0259621	.0189915	.0196844
diff		.0070559	.0003502		.0063695	.0077423

diff = mean(5) - mean(55)   t = 20.1482
Ho: diff = 0   Satterthwaite's degrees of freedom = 21196.5

Ha: diff < 0   Ha: diff != 0   Ha: diff > 0
Pr(T < t) = 1.0000   Pr(|T| > |t|) = 0.0000   Pr(T > t) = 0.0000

Table 6: Quarter two, 2009

```
. ttest excess if low_exp==66 | low_exp==6, by(low_exp) unequal

Two-sample t test with unequal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       6 |  10,714   -.0118341    .0003144    .0325424   -.0124503   -.0112178
      66 |  10,595    .0053482    .0003254    .0334989    .0047103    .0059861
---------+--------------------------------------------------------------------
combined |  21,309   -.0032909    .0002337      .03412   -.0037491   -.0028328
---------+--------------------------------------------------------------------
    diff |           -.0171822    .0004525               -.0180692   -.0162953
------------------------------------------------------------------------------
    diff = mean(6) - mean(66)                                     t = -37.9716
Ho: diff = 0                     Satterthwaite's degrees of freedom =  21272.7

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 7: Quarter three, 2009

```
. ttest excess if low_exp==77 | low_exp==7, by(low_exp) unequal

Two-sample t test with unequal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       7 |  10,646   -.0130608    .0002444    .0252148   -.0135398   -.0125818
      77 |  10,497   -.0009072    .0002256    .0231144   -.0013495    -.000465
---------+--------------------------------------------------------------------
combined |  21,143   -.0070268    .0001716    .0249457   -.0073631   -.0066906
---------+--------------------------------------------------------------------
    diff |           -.0121536    .0003326               -.0128055   -.0115016
------------------------------------------------------------------------------
    diff = mean(7) - mean(77)                                     t = -36.5417
Ho: diff = 0                     Satterthwaite's degrees of freedom =  21029.8

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 8: Quarter four, 2009

```
. ttest excess if low_exp==88 | low_exp==8, by(low_exp) unequal

Two-sample t test with unequal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       8 |  10,753   -.0089601    .0001088    .0112789   -.0091733   -.0087469
      88 |  10,649   -.0049248    .0001145    .0118107   -.0051491   -.0047004
---------+--------------------------------------------------------------------
combined |  21,402   -.0069523    .0000801    .0117213   -.0071093   -.0067952
---------+--------------------------------------------------------------------
    diff |           -.0040353    .0001579               -.0043448   -.0037259
------------------------------------------------------------------------------
    diff = mean(8) - mean(88)                                     t = -25.5577
Ho: diff = 0                     Satterthwaite's degrees of freedom =  21333.7

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Tables 9-22 present evidence on the mean excess return behavior from quarter to quarter, by expense ratio groups. For the low expense ratio group, mean excess return declines in each period except for quarter three and four of 2008 and quarter four of 2009. For the high expense ratio group, mean excess return declines from quarter to quarter except in quarters two and four of 2008 and quarter one of 2009. The labelling process for variables is identical to the one described for tables 1-8.

Table 9: Quarter two, 2008, low expense ratio group

```
. ttest excess if low_exp==1 | low_exp==2, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
1	10,266	.018025	.0001912	.0193758	.0176501	.0183998
2	10,405	.0090456	.000124	.012653	.0088025	.0092888
combined	20,671	.0135051	.0001179	.0169464	.0132741	.0137361
diff		.0089793	.0002279		.0085326	.0094261

```
    diff = mean(1) - mean(2)                                      t =  39.3936
Ho: diff = 0                     Satterthwaite's degrees of freedom =  17639.3

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 10: Quarter three, 2008, low expense ratio group

```
. ttest excess if low_exp==2 | low_exp==3, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
2	10,405	.0090456	.000124	.012653	.0088025	.0092888
3	10,536	.0054184	.0002543	.0261016	.0049199	.0059168
combined	20,941	.0072207	.0001426	.0206299	.0069412	.0075001
diff		.0036272	.0002829		.0030727	.0041818

```
    diff = mean(2) - mean(3)                                      t =  12.8203
Ho: diff = 0                     Satterthwaite's degrees of freedom =  15269.7

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 11: Quarter four, 2008, low expense ratio group

```
. ttest excess if low_exp==3 | low_exp==4, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
3	10,536	.0054184	.0002543	.0261016	.0049199	.0059168
4	10,994	.0343386	.0004027	.0422251	.0335492	.0351279
combined	21,530	.0201861	.0002598	.0381155	.0196769	.0206952
diff		-.0289202	.0004763		-.0298537	-.0279866

```
    diff = mean(3) - mean(4)                                      t = -60.7215
Ho: diff = 0                     Satterthwaite's degrees of freedom =  18446.8

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 12: Quarter one, 2009, low expense ratio group

```
. ttest excess if low_exp==4 | low_exp==5, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
4	10,994	.0343386	.0004027	.0422251	.0335492	.0351279
5	10,768	.0228715	.0002304	.0239131	.0224197	.0233232
combined	21,762	.0286646	.0002364	.0348784	.0282011	.029128
diff		.0114671	.000464		.0105576	.0123766

```
    diff = mean(4) - mean(5)                                      t =  24.7145
Ho: diff = 0                     Satterthwaite's degrees of freedom =  17459.7

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 13: Quarter two, 2009, low expense ratio group

```
. ttest excess if low_exp==5 | low_exp==6, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
5	10,768	.0228715	.0002304	.0239131	.0224197	.0233232
6	10,714	-.0118341	.0003144	.0325424	-.0124503	-.0112178
combined	21,482	.0055623	.0002279	.0334051	.0051156	.0060091
diff		.0347055	.0003898		.0339415	.0354696

```
    diff = mean(5) - mean(6)                                      t =  89.0330
Ho: diff = 0                     Satterthwaite's degrees of freedom =    19668

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 14: Quarter three, 2009, low expense ratio group

```
. ttest excess if low_exp==6 | low_exp==7, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
6	10,714	-.0118341	.0003144	.0325424	-.0124503	-.0112178
7	10,646	-.0130608	.0002444	.0252148	-.0135398	-.0125818
combined	21,360	-.0124455	.0001993	.0291274	-.0128361	-.0120548
diff		.0012267	.0003982		.0004462	.0020072

```
    diff = mean(6) - mean(7)                                      t =   3.0807
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20162.1

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.9990         Pr(|T| > |t|) = 0.0021          Pr(T > t) = 0.0010
```

Table 15: Quarter four, for 2009, low expense ratio group

```
. ttest excess if low_exp==7 | low_exp==8, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
7	10,646	-.0130608	.0002444	.0252148	-.0135398	-.0125818
8	10,753	-.0089601	.0001088	.0112789	-.0091733	-.0087469
combined	21,399	-.0110002	.000134	.0196065	-.0112629	-.0107375
diff		-.0041006	.0002675		-.004625	-.0035763

```
    diff = mean(7) - mean(8)                                      t = -15.3301
Ho: diff = 0                     Satterthwaite's degrees of freedom =  14708.7

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 16: Quarter two, for 2008, high expense ratio group

```
. ttest excess if low_exp==11 | low_exp==22, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
11	10,558	.0072226	.0002068	.0212464	.0068173	.007628
22	10,510	.0102472	.0001636	.0167759	.0099264	.010568
combined	21,068	.0087315	.0001323	.0192063	.0084721	.0089908
diff		-.0030246	.0002637		-.0035414	-.0025077

```
    diff = mean(11) - mean(22)                                    t = -11.4701
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20029.3

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 17: Quarter three, for 2008, high expense ratio group

```
. ttest excess if low_exp==22 | low_exp==33, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
22	10,510	.0102472	.0001636	.0167759	.0099264	.010568
33	10,637	-.0081836	.0003214	.033149	-.0088136	-.0075536
combined	21,147	.0009765	.0001917	.0278835	.0006006	.0013523
diff		.0184308	.0003607		.0177239	.0191378

```
    diff = mean(22) - mean(33)                                    t =  51.1017
Ho: diff = 0                     Satterthwaite's degrees of freedom =  15790.7

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 18: Quarter four, for 2008, high expense ratio group

```
. ttest excess if low_exp==33 | low_exp==44, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
33	10,637	-.0081836	.0003214	.033149	-.0088136	-.0075536
44	11,006	.0115733	.0003931	.0412419	.0108028	.0123439
combined	21,643	.0018633	.0002635	.0387621	.0013468	.0023797
diff		-.0197569	.0005078		-.0207522	-.0187616

```
    diff = mean(33) - mean(44)                                    t = -38.9080
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20949.5

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 19: Quarter one, for 2009, high expense ratio group

```
. ttest excess if low_exp==44 | low_exp==55, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
44	11,006	.0115733	.0003931	.0412419	.0108028	.0123439
55	10,802	.0158156	.0002637	.0274065	.0152987	.0163325
combined	21,808	.0136746	.000238	.035141	.0132082	.014141
diff		-.0042422	.0004734		-.0051701	-.0033144

```
    diff = mean(44) - mean(55)                                    t =  -8.9618
Ho: diff = 0                     Satterthwaite's degrees of freedom =  19179.9

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 20: Quarter two, for 2009, high expense ratio group

```
. ttest excess if low_exp==55 | low_exp==66, by(low_exp) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
55	10,802	.0158156	.0002637	.0274065	.0152987	.0163325
66	10,595	.0053482	.0003254	.0334989	.0047103	.0059861
combined	21,397	.0106325	.0002121	.0310193	.0102169	.0110482
diff		.0104674	.0004189		.0096464	.0112884

```
    diff = mean(55) - mean(66)                                    t =  24.9897
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20432.5

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 21: Quarter three, for 2009, high expense ratio group

```
. ttest excess if low_exp==66 | low_exp==77, by(low_exp) unequal
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
66	10,595	.0053482	.0003254	.0334989	.0047103	.0059861
77	10,497	-.0009072	.0002256	.0231144	-.0013495	-.000465
combined	21,092	.002235	.0001995	.0289713	.001844	.002626
diff		.0062554	.000396		.0054792	.0070316

```
    diff = mean(66) - mean(77)                                     t =  15.7966
Ho: diff = 0                      Satterthwaite's degrees of freedom =  18832.7

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 22: Quarter four, for 2009, high expense ratio group

```
. ttest excess if low_exp==77 | low_exp==88, by(low_exp) unequal
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
77	10,497	-.0009072	.0002256	.0231144	-.0013495	-.000465
88	10,649	-.0049248	.0001145	.0118107	-.0051491	-.0047004
combined	21,146	-.0029305	.0001267	.0184251	-.0031788	-.0026821
diff		.0040176	.000253		.0035217	.0045134

```
    diff = mean(77) - mean(88)                                     t =  15.8812
Ho: diff = 0                      Satterthwaite's degrees of freedom =  15576.8

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 23: Over the entire data sample, expense ratio and excess returns are negatively correlated

```
. corr exp_ratio excess
(obs=163,834)
```

	exp_ra~o	excess
exp_ratio	1.0000	
excess	-0.0497	1.0000

Table 24: Correlation between expense ratio and excess returns for the high expense ratio group

```
. corr exp_ratio excess if highlow==1
(obs=82,611)
```

	exp_ra~o	excess
exp_ratio	1.0000	
excess	-0.0404	1.0000

Table 25: Correlation between expense ratio and excess returns for the low expense ratio group

```
. corr exp_ratio excess if highlow==0
(obs=81,223)
```

	exp_ra~o	excess
exp_ratio	1.0000	
excess	-0.0174	1.0000

Table 26: Correlation between expense ratio and excess returns for the high expense ratio group by each quarter

```
. corr exp_ratio excess if  dq==tq(2008q1) & highlow==1
(obs=10,242)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.1315   1.0000


. corr exp_ratio excess if  dq==tq(2008q2) & highlow==1
(obs=10,133)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.1005   1.0000


. corr exp_ratio excess if  dq==tq(2008q3) & highlow==1
(obs=10,313)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.1019   1.0000


. corr exp_ratio excess if  dq==tq(2008q4) & highlow==1
(obs=10,572)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.0984   1.0000


. corr exp_ratio excess if  dq==tq(2009q1) & highlow==1
(obs=10,491)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.0620   1.0000


. corr exp_ratio excess if  dq==tq(2009q2) & highlow==1
(obs=10,280)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |   0.0871   1.0000


. corr exp_ratio excess if  dq==tq(2009q3) & highlow==1
(obs=10,214)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.0009   1.0000


. corr exp_ratio excess if  dq==tq(2009q4) & highlow==1
(obs=10,366)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |   0.0470   1.0000
```

Table 27: Correlation between expense ratio and excess returns for the low expense ratio group by each quarter

```
. corr exp_ratio excess if  dq==tq(2008q1) & highlow==0
(obs=9,727)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.1891   1.0000


. corr exp_ratio excess if  dq==tq(2008q2) & highlow==0
(obs=9,909)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |   0.0468   1.0000


. corr exp_ratio excess if  dq==tq(2008q3) & highlow==0
(obs=10,076)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.1649   1.0000


. corr exp_ratio excess if  dq==tq(2008q4) & highlow==0
(obs=10,438)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.1803   1.0000


. corr exp_ratio excess if  dq==tq(2009q1) & highlow==0
(obs=10,317)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |  -0.0495   1.0000


. corr exp_ratio excess if  dq==tq(2009q2) & highlow==0
(obs=10,244)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |   0.1551   1.0000


. corr exp_ratio excess if  dq==tq(2009q3) & highlow==0
(obs=10,199)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |   0.1716   1.0000


. corr exp_ratio excess if  dq==tq(2009q4) & highlow==0
(obs=10,313)

             | exp_ra~o   excess
-------------+------------------
   exp_ratio |   1.0000
      excess |   0.1377   1.0000
```

Table 28: Correlation between expense ratio and trust, by quarter, 2008

```
. corr exp_ratio trust if  dq==tq(2008q1)
(obs=19,062)

             | exp_ra~o    trust
-------------+------------------
   exp_ratio |   1.0000
       trust |   0.2592   1.0000

. corr exp_ratio trust if  dq==tq(2008q2)
(obs=19,295)

             | exp_ra~o    trust
-------------+------------------
   exp_ratio |   1.0000
       trust |   0.1572   1.0000

. corr exp_ratio trust  if  dq==tq(2008q3)
(obs=19,544)

             | exp_ra~o    trust
-------------+------------------
   exp_ratio |   1.0000
       trust |   0.2051   1.0000

. corr exp_ratio trust  if  dq==tq(2008q4)
(obs=19,883)

             | exp_ra~o    trust
-------------+------------------
   exp_ratio |   1.0000
       trust |   0.2611   1.0000
```

Table 29: Correlation between expense ratio and trust, by quarter, 2009

```
. corr exp_ratio trust  if  dq==tq(2009q1)
(obs=20,014)

             | exp_ra~o    trust
-------------+------------------
   exp_ratio |   1.0000
       trust |  -0.0811   1.0000

. corr exp_ratio trust  if  dq==tq(2009q2)
(obs=19,811)

             | exp_ra~o    trust
-------------+------------------
   exp_ratio |   1.0000
       trust |  -0.2177   1.0000

. corr exp_ratio trust  if  dq==tq(2009q3)
(obs=19,485)

             | exp_ra~o    trust
-------------+------------------
   exp_ratio |   1.0000
       trust |  -0.2119   1.0000

. corr exp_ratio trust  if  dq==tq(2009q4)
(obs=19,642)

             | exp_ra~o    trust
-------------+------------------
   exp_ratio |   1.0000
       trust |  -0.2319   1.0000
```

Table 30: "Trust" for the low expense ratio group is lower than the high expense ratio group for 2008

```
. ttest trust if low_exp==1  | low_exp==11 , by(low_exp) unequal

Two-sample t test with unequal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       1 |   9,744   -.0120626    .0002152    .0212382   -.0124843   -.0116409
      11 |  10,088   -.0003666    .0002349    .0235886   -.0008269    .0000938
---------+--------------------------------------------------------------------
combined |  19,832   -.0061132    .0001648    .0232125   -.0064362   -.0057901
---------+--------------------------------------------------------------------
    diff |            -.011696    .0003185               -.0123203   -.0110717
------------------------------------------------------------------------------
    diff = mean(1) - mean(11)                                     t = -36.7212
Ho: diff = 0                     Satterthwaite's degrees of freedom =  19733.2

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000

. ttest trust if low_exp==2 | low_exp==22, by(low_exp) unequal

Two-sample t test with unequal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       2 |  10,051    .0012311    .0001569    .0157295    .0009235    .0015386
      22 |  10,056    .0051907    .0001921    .0192656    .0048141    .0055673
---------+--------------------------------------------------------------------
combined |  20,107    .0032114    .0001248    .0176977    .0029668     .003456
---------+--------------------------------------------------------------------
    diff |           -.0039597     .000248               -.0044459   -.0034735
------------------------------------------------------------------------------
    diff = mean(2) - mean(22)                                     t = -15.9636
Ho: diff = 0                     Satterthwaite's degrees of freedom =    19335

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000

. ttest trust if low_exp==3  | low_exp==33 , by(low_exp) unequal

Two-sample t test with unequal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       3 |  10,134    .0006728    .0003144    .0316496    .0000565    .0012891
      33 |  10,135    .0143247    .0004271    .0429953    .0134876    .0151619
---------+--------------------------------------------------------------------
combined |  20,269    .0074991    .0002695    .0383627    .0069709    .0080272
---------+--------------------------------------------------------------------
    diff |           -.0136519    .0005303               -.0146914   -.0126125
------------------------------------------------------------------------------
    diff = mean(3) - mean(33)                                     t = -25.7427
Ho: diff = 0                     Satterthwaite's degrees of freedom =  18623.8

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000

. ttest trust if low_exp==4 | low_exp==44, by(low_exp) unequal

Two-sample t test with unequal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       4 |  10,412   -.0370087    .0003673    .0374801   -.0377287   -.0362887
      44 |  10,387   -.0177748    .0003858    .0393178    -.018531   -.0170186
---------+--------------------------------------------------------------------
combined |  20,799   -.0274033    .0002745    .0395936   -.0279414   -.0268652
---------+--------------------------------------------------------------------
    diff |           -.0192339    .0005327                -.020278   -.0181898
------------------------------------------------------------------------------
    diff = mean(4) - mean(44)                                     t = -36.1078
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20744.7

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

Table 31: “Trust” for the high expense ratio group is lower than the low expense ratio group for 2009

```
. ttest trust if low_exp==5  | low_exp==55, by(low_exp) unequal
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
5	10,364	-.0382942	.0002181	.0222029	-.0387217	-.0378667
55	10,366	-.0418067	.0003024	.0307895	-.0423995	-.0412139
combined	20,730	-.0400506	.0001868	.0268989	-.0404168	-.0396844
diff		.0035125	.0003729		.0027817	.0042433

```
    diff = mean(5) - mean(55)                                     t =   9.4206
Ho: diff = 0                     Satterthwaite's degrees of freedom =  18850.5

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

```
. ttest trust if low_exp==6 | low_exp==66, by(low_exp) unequal
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
6	10,371	.0114324	.0003471	.0353462	.0107521	.0121128
66	10,178	-.0042938	.0003795	.0382826	-.0050377	-.00355
combined	20,549	.0036431	.0002627	.037659	.0031282	.0041581
diff		.0157263	.0005143		.0147183	.0167342

```
    diff = mean(6) - mean(66)                                     t =  30.5806
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20350.1

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

```
. ttest trust if low_exp==7  | low_exp==77, by(low_exp) unequal
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
7	10,190	-.0115611	.0004537	.0457991	-.0124504	-.0106717
77	9,960	-.0370376	.0004716	.0470645	-.037962	-.0361132
combined	20,150	-.0241539	.0003392	.0481434	-.0248187	-.0234892
diff		.0254765	.0006544		.0241939	.0267592

```
    diff = mean(7) - mean(77)                                     t =  38.9311
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20097.6

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

```
. ttest trust if low_exp==8 | low_exp==88, by(low_exp) unequal
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
8	10,226	-.033607	.0005028	.0508441	-.0345926	-.0326215
88	10,048	-.0597921	.0004728	.0473899	-.0607188	-.0588654
combined	20,274	-.0465846	.0003573	.0508748	-.0472849	-.0458843
diff		.026185	.0006901		.0248323	.0275378

```
    diff = mean(8) - mean(88)                                     t =  37.9411
Ho: diff = 0                     Satterthwaite's degrees of freedom =  20215.8

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 32: Institutional funds have a lower mean expense ratio than retail funds

```
. ttest exp_ratio, by(inst_id) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
N	105,194	.0140773	.0000233	.0075491	.0140317	.0141229
Y	61,525	.0083091	.0000187	.0046483	.0082724	.0083458
combined	166,719	.0119486	.0000176	.0071888	.0119141	.0119831
diff		.0057682	.0000299		.0057096	.0058267

```
    diff = mean(N) - mean(Y)                                      t = 193.0309
Ho: diff = 0                     Satterthwaite's degrees of freedom =   166296

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000
```

Table 33: Institutional funds have a lower mean level of trust than retail funds

```
. ttest trust, by(inst_id) unequal

Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
N	99,040	-.0068554	.0001824	.0574178	-.007213	-.0064978
Y	57,696	-.0080074	.0002433	.0584493	-.0084843	-.0075305
combined	156,736	-.0072795	.000146	.0578021	-.0075656	-.0069933
diff		.001152	.0003041		.0005559	.0017481

```
    diff = mean(N) - mean(Y)                                      t =   3.7876
Ho: diff = 0                     Satterthwaite's degrees of freedom =   118906

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.9999         Pr(|T| > |t|) = 0.0002          Pr(T > t) = 0.0001
```

(ii) Fama-French Tables:
Table 1: Regression over entire data sample with and without expense ratio variable

```
. xtreg expret hml smb mktrf, fe

Fixed-effects (within) regression               Number of obs     =    159,445
Group variable: crsp_fundno                     Number of groups  =     23,176

R-sq:                                           Obs per group:
     within  = 0.2619                                         min =          1
     between = 0.1473                                         avg =        6.9
     overall = 0.2446                                         max =          8

                                                F(3,136266)       =   16119.74
corr(u_i, Xb)  = 0.0201                         Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         hml |  -.0593221    .003736   -15.88   0.000    -.0666445   -.0519997
         smb |   1.561063   .0101472   153.84   0.000     1.541175    1.580952
       mktrf |  -.3604745   .0019793  -182.12   0.000    -.3643539   -.3565952
       _cons |  -.0229586   .0000951  -241.40   0.000     -.023145   -.0227722
-------------+----------------------------------------------------------------
     sigma_u |  .01397924
     sigma_e |  .02674642
         rho |  .21455992   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(23175, 136266) = 1.09               Prob > F = 0.0000

. xtreg expret exp_ratio hml smb mktrf, fe

Fixed-effects (within) regression               Number of obs     =    159,445
Group variable: crsp_fundno                     Number of groups  =     23,176

R-sq:                                           Obs per group:
     within  = 0.2638                                         min =          1
     between = 0.1356                                         avg =        6.9
     overall = 0.2467                                         max =          8

                                                F(4,136265)       =   12204.12
corr(u_i, Xb)  = -0.0416                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -.6725723   .0365964   -18.38   0.000    -.7443005   -.6008441
         hml |  -.0585421   .0037316   -15.69   0.000     -.065856   -.0512282
         smb |   1.555572   .0101391   153.42   0.000     1.535699    1.575444
       mktrf |  -.3592259    .001978  -181.61   0.000    -.3631028    -.355349
       _cons |  -.0148814   .0004496   -33.10   0.000    -.0157627   -.0140002
-------------+----------------------------------------------------------------
     sigma_u |   .0142238
     sigma_e |  .02671343
         rho |  .22088785   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(23175, 136265) = 1.04               Prob > F = 0.0001
```

<u>Table 2: Regression on only high expense ratio group, followed by low expense ratio group</u>

```
. xtreg expret exp_ratio hml smb mktrf if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     80,424
Group variable: crsp_fundno                     Number of groups  =     12,284

R-sq:                                           Obs per group:
     within  = 0.2872                                         min =          1
     between = 0.2387                                         avg =        6.5
     overall = 0.2765                                         max =          8

                                                F(4,68136)        =    6863.40
corr(u_i, Xb)  = 0.0008                         Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
exp_ratio	-.5232791	.0417084	-12.55	0.000	-.6050276	-.4415307
hml	-.0717505	.0058036	-12.36	0.000	-.0831256	-.0603755
smb	1.848777	.0158111	116.93	0.000	1.817788	1.879767
mktrf	-.4177015	.0031045	-134.55	0.000	-.4237863	-.4116166
_cons	-.0188993	.0007284	-25.95	0.000	-.0203269	-.0174717
sigma_u	.01529681					
sigma_e	.02947106					
rho	.21223115	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(12283, 68136) = 0.83              Prob > F = 1.0000
```

```
. xtreg expret exp_ratio hml smb mktrf if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     79,021
Group variable: crsp_fundno                     Number of groups  =     11,933

R-sq:                                           Obs per group:
     within  = 0.2367                                         min =          1
     between = 0.0514                                         avg =        6.6
     overall = 0.1258                                         max =          8

                                                F(4,67084)        =    5200.69
corr(u_i, Xb)  = -0.5026                        Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
exp_ratio	-4.359249	.2199596	-19.82	0.000	-4.790369	-3.928128
hml	-.0476589	.0045652	-10.44	0.000	-.0566067	-.0387112
smb	1.229873	.012412	99.09	0.000	1.205546	1.254201
mktrf	-.2883821	.0024231	-119.01	0.000	-.2931314	-.2836328
_cons	.0120453	.0015082	7.99	0.000	.0090892	.0150013
sigma_u	.0188095					
sigma_e	.02291264					
rho	.40259772	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(11932, 67084) = 1.52              Prob > F = 0.0000
```

Table 3: Regression on high expense ratio group without expense ratio, followed by low expense ratio group

```
. xtreg expret hml smb mktrf if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     80,424
Group variable: crsp_fundno                     Number of groups  =     12,284

R-sq:                                           Obs per group:
     within  = 0.2856                                         min =          1
     between = 0.3022                                         avg =        6.5
     overall = 0.2809                                         max =          8

                                                F(3,68137)        =    9077.90
corr(u_i, Xb)  = 0.0427                         Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         hml |  -.0728037   .0058097   -12.53   0.000    -.0841906   -.0614168
         smb |   1.856965   .0158157   117.41   0.000     1.825966    1.887964
       mktrf |  -.4197937   .0031036  -135.26   0.000    -.4258768   -.4137107
       _cons |  -.0278472   .0001481  -188.07   0.000    -.0281374   -.0275569
-------------+----------------------------------------------------------------
     sigma_u |  .01475489
     sigma_e |  .02950487
         rho |  .20005332   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(12283, 68137) = 0.82                Prob > F = 1.0000
```

```
. xtreg expret hml smb mktrf if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     79,021
Group variable: crsp_fundno                     Number of groups  =     11,933

R-sq:                                           Obs per group:
     within  = 0.2322                                         min =          1
     between = 0.1678                                         avg =        6.6
     overall = 0.2130                                         max =          8

                                                F(3,67085)        =    6763.83
corr(u_i, Xb)  = 0.0344                         Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         hml |  -.0487611   .0045782   -10.65   0.000    -.0577343    -.039788
         smb |   1.235284   .0124452    99.26   0.000     1.210892    1.259677
       mktrf |   -.288651   .0024302  -118.78   0.000    -.2934141   -.2838879
       _cons |  -.0177558   .0001164  -152.49   0.000     -.017984   -.0175276
-------------+----------------------------------------------------------------
     sigma_u |  .01484314
     sigma_e |  .02297944
         rho |  .29439684   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(11932, 67085) = 1.51                Prob > F = 0.0000
```

Table 4: Regression in the context of institutional funds

```
. xtreg expret exp_ratio hml smb mktrf

Random-effects GLS regression                   Number of obs     =     58,414
Group variable: crsp_fundno                     Number of groups  =      8,907

R-sq:                                           Obs per group:
     within  = 0.2681                                         min =          1
     between = 0.1610                                         avg =        6.6
     overall = 0.2591                                         max =          8

                                                Wald chi2(4)      =   20783.69
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

expret	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
exp_ratio	-.7005864	.0320952	-21.83	0.000	-.7634919	-.637681
hml	-.0624245	.0060009	-10.40	0.000	-.0741859	-.050663
smb	1.59396	.0162708	97.96	0.000	1.56207	1.62585
mktrf	-.3704899	.0031282	-118.44	0.000	-.376621	-.3643587
_cons	-.0175018	.0003266	-53.59	0.000	-.0181418	-.0168618
sigma_u	.00982972					
sigma_e	.02666306					
rho	.11965117	(fraction of variance due to u_i)				

Table 5: Regression in the context of high expense ratio institutional funds

```
. xtreg expret exp_ratio hml smb mktrf if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     14,225
Group variable: crsp_fundno                     Number of groups  =      2,516

R-sq:                                           Obs per group:
     within  = 0.3331                                         min =          1
     between = 0.1759                                         avg =        5.7
     overall = 0.3043                                         max =          8

                                                F(4,11705)        =    1461.76
corr(u_i, Xb)  = -0.1104                        Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
exp_ratio	-2.129428	.2887768	-7.37	0.000	-2.695479	-1.563378
hml	-.0972311	.0144268	-6.74	0.000	-.1255101	-.0689522
smb	2.173914	.0396497	54.83	0.000	2.096194	2.251635
mktrf	-.4721406	.007844	-60.19	0.000	-.4875161	-.456765
_cons	-.0014676	.0042082	-0.35	0.727	-.0097163	.0067811
sigma_u	.02084487					
sigma_e	.03037918					
rho	.32010275	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(2515, 11705) = 0.77               Prob > F = 1.0000
```

Table 6: Regression in institutional context, without expense ratio variable

```
. xtreg expret hml smb mktrf if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     14,225
Group variable: crsp_fundno                     Number of groups  =      2,516

R-sq:                                           Obs per group:
     within  = 0.3300                                         min =          1
     between = 0.3116                                         avg =        5.7
     overall = 0.3369                                         max =          8

                                                F(3,11706)        =    1922.12
corr(u_i, Xb)  = 0.0509                         Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
hml	-.099596	.0144561	-6.89	0.000	-.1279323	-.0712597
smb	2.197684	.0396085	55.49	0.000	2.120044	2.275323
mktrf	-.4785277	.0078138	-61.24	0.000	-.4938441	-.4632114
_cons	-.0323823	.0003645	-88.85	0.000	-.0330967	-.0316679
sigma_u	.0185364					
sigma_e	.03044836					
rho	.27040054	(fraction of variance due to u_i)				

F test that all u_i=0: F(2515, 11706) = 0.75 Prob > F = 1.0000

Table 7: Regression on low expense funds in institutional context

```
. xtreg expret exp_ratio hml smb mktrf if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     44,189
Group variable: crsp_fundno                     Number of groups  =      6,800

R-sq:                                           Obs per group:
     within  = 0.2432                                         min =          1
     between = 0.0983                                         avg =        6.5
     overall = 0.1760                                         max =          8

                                                F(4,37385)        =    3003.94
corr(u_i, Xb)  = -0.3446                        Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
exp_ratio	-3.625514	.3419536	-10.60	0.000	-4.295752	-2.955275
hml	-.0600842	.0066785	-9.00	0.000	-.0731743	-.0469942
smb	1.393825	.0181946	76.61	0.000	1.358163	1.429486
mktrf	-.3183673	.0035499	-89.68	0.000	-.3253252	-.3114095
_cons	.0027892	.0021788	1.28	0.201	-.0014814	.0070598
sigma_u	.01848341					
sigma_e	.02498982					
rho	.35361426	(fraction of variance due to u_i)				

F test that all u_i=0: F(6799, 37385) = 1.42 Prob > F = 0.0000

Table 8: Regression in low expense ratio, institutional context without expense ratio term

```
. xtreg expret hml smb mktrf if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     44,189
Group variable: crsp_fundno                     Number of groups  =      6,800

R-sq:                                           Obs per group:
     within  = 0.2410                                         min =          1
     between = 0.1502                                         avg =        6.5
     overall = 0.2218                                         max =          8

                                                F(3,37386)        =    3955.99
corr(u_i, Xb)  = 0.0312                         Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
hml	-.0615285	.0066871	-9.20	0.000	-.0746353	-.0484217
smb	1.402	.0182053	77.01	0.000	1.366317	1.437683
mktrf	-.3193413	.003554	-89.85	0.000	-.3263072	-.3123754
_cons	-.020242	.0001695	-119.44	0.000	-.0205741	-.0199098
sigma_u	.01661451					
sigma_e	.02502703					
rho	.30589953	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(6799, 37386) = 1.46                 Prob > F = 0.0000
```

Table 9: Regression in retail fund context, entire data sample

```
. xtreg expret exp_ratio hml smb mktrf

Random-effects GLS regression                   Number of obs     =    101,031
Group variable: crsp_fundno                     Number of groups  =     14,373

R-sq:                                           Obs per group:
     within  = 0.2597                                         min =          1
     between = 0.1954                                         avg =        7.0
     overall = 0.2508                                         max =          8

                                                Wald chi2(4)      =   33859.84
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

expret	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
exp_ratio	-.3710374	.0110944	-33.44	0.000	-.3927821	-.3492927
hml	-.0443915	.0046088	-9.63	0.000	-.0534245	-.0353584
smb	1.525388	.0124882	122.15	0.000	1.500911	1.549864
mktrf	-.3663061	.0024038	-152.39	0.000	-.3710174	-.3615948
_cons	-.0175383	.0001966	-89.22	0.000	-.0179235	-.017153
sigma_u	.00154273					
sigma_e	.02670727					
rho	.00332564	(fraction of variance due to u_i)				

Table 10: Retail fund context, high expense ratio, expense ratio independent variable

```
. xtreg expret exp_ratio hml smb mktrf if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     66,199
Group variable: crsp_fundno                     Number of groups  =      9,824

R-sq:                                           Obs per group:
     within  = 0.2773                                         min =          1
     between = 0.2329                                         avg =        6.7
     overall = 0.2663                                         max =          8

                                                F(4,56371)        =    5406.75
corr(u_i, Xb)  = 0.0015                         Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -.4914632   .0418125   -11.75   0.000     -.573416   -.4095104
         hml |   -.065343   .0063255   -10.33   0.000    -.0777409    -.052945
         smb |    1.77466   .0172171   103.08   0.000     1.740915    1.808406
       mktrf |  -.4046635   .0033771  -119.83   0.000    -.4112825   -.3980444
       _cons |  -.0181683   .0007556   -24.04   0.000    -.0196494   -.0166872
-------------+----------------------------------------------------------------
     sigma_u |  .01424946
     sigma_e |  .02921394
         rho |  .19218827   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(9823, 56371) = 0.84                 Prob > F = 1.0000
```

Table 11: Retail fund context, low expense ratio, expense ratio independent variable

```
. xtreg expret exp_ratio hml smb mktrf if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     34,832
Group variable: crsp_fundno                     Number of groups  =      5,181

R-sq:                                           Obs per group:
     within  = 0.2339                                         min =          1
     between = 0.0244                                         avg =        6.7
     overall = 0.0891                                         max =          8

                                                F(4,29647)        =    2262.84
corr(u_i, Xb)  = -0.6107                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -4.875174   .2674801   -18.23   0.000    -5.399446   -4.350901
         hml |  -.0318145   .0059289    -5.37   0.000    -.0434353   -.0201937
         smb |   1.022633   .0160889    63.56   0.000     .9910979    1.054168
       mktrf |   -.249874   .0031453   -79.44   0.000     -.256039   -.2437091
       _cons |   .0217729   .0019984    10.90   0.000      .017856    .0256898
-------------+----------------------------------------------------------------
     sigma_u |  .01788505
     sigma_e |  .01981231
         rho |   .4490086   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(5180, 29647) = 1.61                 Prob > F = 0.0000
```

Table 12: Low expense ratio group without expense ratio independent variable

```
. xtreg expret hml smb mktrf if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     34,832
Group variable: crsp_fundno                     Number of groups  =      5,181

R-sq:                                           Obs per group:
     within  = 0.2253                                         min =          1
     between = 0.2193                                         avg =        6.7
     overall = 0.2066                                         max =          8

                                                F(3,29648)        =    2874.28
corr(u_i, Xb)  = 0.0382                         Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
hml	-.0320802	.0059619	-5.38	0.000	-.0437657	-.0203947
smb	1.022314	.0161785	63.19	0.000	.9906031	1.054024
mktrf	-.2488941	.0031624	-78.71	0.000	-.2550924	-.2426957
_cons	-.0145452	.0001523	-95.49	0.000	-.0148437	-.0142466
sigma_u	.01204748					
sigma_e	.01992266					
rho	.26776238	(fraction of variance due to u_i)				

F test that all u_i=0: F(5180, 29648) = 1.53 Prob > F = 0.0000

Table 13: Low-trust retail fund group with expense ratio independent variable

```
. xtreg expret exp_ratio hml smb mktrf if lowtrust==1, fe

Fixed-effects (within) regression               Number of obs     =     60,348
Group variable: crsp_fundno                     Number of groups  =     19,227

R-sq:                                           Obs per group:
     within  = 0.5741                                         min =          1
     between = 0.1035                                         avg =        3.1
     overall = 0.4535                                         max =          7

                                                F(4,41117)        =   13855.09
corr(u_i, Xb)  = -0.0252                        Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
exp_ratio	-.2611068	.0524917	-4.97	0.000	-.3639916	-.158222
hml	-.6517163	.0064661	-100.79	0.000	-.6643899	-.6390427
smb	3.991627	.0179733	222.09	0.000	3.956399	4.026855
mktrf	-.1874475	.006578	-28.50	0.000	-.2003406	-.1745544
_cons	-.0520888	.0006874	-75.78	0.000	-.0534361	-.0507415
sigma_u	.01931168					
sigma_e	.02479405					
rho	.37759082	(fraction of variance due to u_i)				

F test that all u_i=0: F(19226, 41117) = 1.48 Prob > F = 0.0000

Table 14: High-trust retail funds, expense ratio independent variable

```
. xtreg expret exp_ratio hml smb mktrf if lowtrust==0, fe

Fixed-effects (within) regression               Number of obs     =     99,097
Group variable: crsp_fundno                     Number of groups  =     22,138

R-sq:                                           Obs per group:
     within  = 0.1711                                         min =          1
     between = 0.0996                                         avg =        4.5
     overall = 0.1421                                         max =          8

                                                F(4,76955)        =    3970.63
corr(u_i, Xb)  = -0.0094                        Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
exp_ratio	-.2276716	.0285408	-7.98	0.000	-.2836114	-.1717319
hml	.2266688	.0028143	80.54	0.000	.2211527	.2321848
smb	-.0771766	.0072482	-10.65	0.000	-.091383	-.0629702
mktrf	.0423018	.0018579	22.77	0.000	.0386604	.0459432
_cons	.0076472	.0003421	22.35	0.000	.0069767	.0083177
sigma_u	.00965991					
sigma_e	.01490336					
rho	.29583624	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(22137, 76955) = 1.43               Prob > F = 0.0000
```

(iii) Value and Momentum Tables:

Table 1: Entire data sample regression

```
. xtreg expret sprtrn mom_1, fe

Fixed-effects (within) regression               Number of obs     =    158,832
Group variable: crsp_fundno                     Number of groups  =     23,172

R-sq:                                           Obs per group:
     within  = 0.0618                                         min =          1
     between = 0.1609                                         avg =        6.9
     overall = 0.0628                                         max =          8

                                                F(2,135658)       =    4466.75
corr(u_i, Xb)  = 0.0368                         Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
sprtrn	-.1734359	.0018468	-93.91	0.000	-.1770556	-.1698163
mom_1	.0254795	.0043667	5.83	0.000	.0169208	.0340382
_cons	-.0123125	.0000791	-155.72	0.000	-.0124674	-.0121575
sigma_u	.01426801					
sigma_e	.03022261					
rho	.1822554	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(23171, 135658) = 0.89              Prob > F = 1.0000
```

Table 2: Entire data sample regression including expense ratio independent variable

```
. xtreg expret exp_ratio sprtrn mom_1, fe

Fixed-effects (within) regression               Number of obs     =    158,832
Group variable: crsp_fundno                     Number of groups  =     23,172

R-sq:                                           Obs per group:
     within  = 0.0649                                         min =          1
     between = 0.0682                                         avg =        6.9
     overall = 0.0603                                         max =          8

                                                F(3,135657)       =    3138.56
corr(u_i, Xb)  = -0.1797                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -.8808309   .0414099   -21.27   0.000    -.9619935   -.7996683
      sprtrn |  -.1722687   .0018445   -93.39   0.000    -.1758839   -.1686534
       mom_1 |   .0257361   .0043595     5.90   0.000     .0171915    .0342806
       _cons |  -.0017633   .0005022    -3.51   0.000    -.0027476   -.0007791
-------------+----------------------------------------------------------------
     sigma_u |  .01496084
     sigma_e |  .03017245
         rho |  .19734271   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(23171, 135657) = 0.86              Prob > F = 1.0000
```

Table 3: Low-trust group regression

```
. xtreg expret exp_ratio mom_1 sprtrn if lowtrust==1, fe

Fixed-effects (within) regression               Number of obs     =     60,343
Group variable: crsp_fundno                     Number of groups  =     19,224

R-sq:                                           Obs per group:
     within  = 0.0471                                         min =          1
     between = 0.0038                                         avg =        3.1
     overall = 0.0200                                         max =          7

                                                F(3,41116)        =     677.71
corr(u_i, Xb)  = -0.3230                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -1.129029   .0782929   -14.42   0.000    -1.282485   -.9755733
       mom_1 |   .0488012   .0100931     4.84   0.000     .0290185    .0685838
      sprtrn |   .2289442    .005367    42.66   0.000     .2184248    .2394636
       _cons |  -.0238704   .0010046   -23.76   0.000    -.0258394   -.0219014
-------------+----------------------------------------------------------------
     sigma_u |   .0220465
     sigma_e |  .03708587
         rho |  .26111834   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(19223, 41116) = 0.79               Prob > F = 1.0000
```

Table 4: High-trust group regression

```
. xtreg expret exp_ratio mom_1 sprtrn if lowtrust==0, fe

Fixed-effects (within) regression               Number of obs     =     98,489
Group variable: crsp_fundno                     Number of groups  =     22,134

R-sq:                                           Obs per group:
     within  = 0.0692                                         min =          1
     between = 0.0190                                         avg =        4.4
     overall = 0.0433                                         max =          8

                                                F(3,76352)        =    1892.15
corr(u_i, Xb)  = -0.1182                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -.2447971   .0304938    -8.03   0.000    -.3045647   -.1850295
       mom_1 |   .0049982   .0040838     1.22   0.221     -.003006    .0130024
      sprtrn |   .1299981   .0017351    74.92   0.000     .1265974    .1333988
       _cons |   .0093742   .0003612    25.95   0.000     .0086662    .0100822
-------------+----------------------------------------------------------------
     sigma_u |  .01017392
     sigma_e |  .01585398
         rho |  .29169085   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(22133, 76352) = 1.39               Prob > F = 0.0000
```

Table 5: Institutional fund regression without expense ratio variable

```
. xtreg expret mom_1 sprtrn, fe

Fixed-effects (within) regression               Number of obs     =     58,129
Group variable: crsp_fundno                     Number of groups  =      8,903

R-sq:                                           Obs per group:
     within  = 0.0625                                         min =          1
     between = 0.0840                                         avg =        6.5
     overall = 0.0560                                         max =          8

                                                F(2,49224)        =    1641.55
corr(u_i, Xb)  = -0.0303                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       mom_1 |   .0664625   .0067447     9.85   0.000     .0532427    .0796823
      sprtrn |  -.1710647   .0030688   -55.74   0.000    -.1770796   -.1650499
       _cons |  -.0126816   .0001309   -96.91   0.000    -.0129381   -.0124252
-------------+----------------------------------------------------------------
     sigma_u |  .01714741
     sigma_e |  .03029153
         rho |  .24268003   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(8902, 49224) = 1.03                Prob > F = 0.0295
```

Table 6: Institutional fund regression with expense ratio variable

```
. xtreg expret exp_ratio mom_1 sprtrn, fe

Fixed-effects (within) regression               Number of obs     =     58,129
Group variable: crsp_fundno                     Number of groups  =      8,903

R-sq:                                           Obs per group:
     within  = 0.0680                                         min =          1
     between = 0.0584                                         avg =        6.5
     overall = 0.0410                                         max =          8

                                                F(3,49223)        =    1196.49
corr(u_i, Xb)  = -0.6281                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -3.313812   .1955142   -16.95   0.000    -3.697022   -2.930602
       mom_1 |   .0674817   .0067255    10.03   0.000     .0542997    .0806638
      sprtrn |  -.1693082   .0030616   -55.30   0.000    -.1753091   -.1633073
       _cons |   .0148991   .0016325     9.13   0.000     .0116994    .0180988
-------------+----------------------------------------------------------------
     sigma_u |  .02131281
     sigma_e |  .03020383
         rho |  .33240644   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(8902, 49223) = 0.99                 Prob > F = 0.7045
```

Table 7: Institutional fund regression in high expense ratio context

```
. xtreg expret exp_ratio mom_1 sprtrn  if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     14,213
Group variable: crsp_fundno                     Number of groups  =      2,513

R-sq:                                           Obs per group:
     within  = 0.0733                                         min =          1
     between = 0.0059                                         avg =        5.7
     overall = 0.0284                                         max =          8

                                                F(3,11697)        =     308.42
corr(u_i, Xb)  = -0.5058                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -3.889008   .3391479   -11.47   0.000    -4.553794   -3.224222
       mom_1 |   .0592972    .012971     4.57   0.000     .0338719    .0847225
      sprtrn |  -.1973459   .0075305   -26.21   0.000    -.2121069   -.1825849
       _cons |   .0383332   .0049099     7.81   0.000     .0287089    .0479575
-------------+----------------------------------------------------------------
     sigma_u |  .02619713
     sigma_e |  .03582372
         rho |  .34843606   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(2512, 11697) = 0.74                 Prob > F = 1.0000
```

Table 8: Institutional fund regression in high expense ratio context without expense ratio independent variable

```
. xtreg expret mom_1 sprtrn  if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     14,213
Group variable: crsp_fundno                     Number of groups  =      2,513

R-sq:                                           Obs per group:
     within  = 0.0629                                         min =          1
     between = 0.1931                                         avg =        5.7
     overall = 0.0749                                         max =          8

                                                F(2,11698)        =     392.51
corr(u_i, Xb)  = 0.0571                         Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       mom_1 |   .0593815   .0130431     4.55   0.000     .0338147    .0849482
      sprtrn |   -.204765   .0075444   -27.14   0.000    -.2195532   -.1899767
       _cons |   -.017851   .0003196   -55.86   0.000    -.0184774   -.0172245
-------------+----------------------------------------------------------------
     sigma_u |  .02044859
     sigma_e |  .03602297
         rho |  .24370256   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(2512, 11698) = 0.68                 Prob > F = 1.0000
```

Table 9: Institutional fund regression in low expense ratio context with expense ratio independent variable

```
. xtreg expret exp_ratio mom_1 sprtrn  if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     43,916
Group variable: crsp_fundno                     Number of groups  =      6,796

R-sq:                                           Obs per group:
     within  = 0.0626                                         min =          1
     between = 0.0464                                         avg =        6.5
     overall = 0.0292                                         max =          8

                                                F(3,37117)        =     826.21
corr(u_i, Xb)  = -0.6567                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -5.123483   .3912246   -13.10   0.000    -5.890294   -4.356672
       mom_1 |   .0709305   .0079486     8.92   0.000      .055351      .08651
      sprtrn |  -.1511336   .0032558   -46.42   0.000    -.1575151   -.1447522
       _cons |   .0215653   .0024853     8.68   0.000     .0166941    .0264365
-------------+----------------------------------------------------------------
     sigma_u |  .02141883
     sigma_e |  .02791265
         rho |  .37060577   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(6795, 37117) = 1.22                 Prob > F = 0.0000
```

Table 10: Institutional fund regression in low expense ratio context without expense ratio independent variable

```
. xtreg expret mom_1 sprtrn  if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     43,916
Group variable: crsp_fundno                     Number of groups  =      6,796

R-sq:                                           Obs per group:
     within  = 0.0583                                         min =          1
     between = 0.0727                                         avg =        6.5
     overall = 0.0499                                         max =          8

                                                F(2,37118)        =    1148.28
corr(u_i, Xb)  = -0.0355                        Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mom_1	.0695836	.0079662	8.73	0.000	.0539696	.0851975
sprtrn	-.1520942	.0032624	-46.62	0.000	-.1584886	-.1456997
_cons	-.0109316	.0001384	-78.97	0.000	-.0112029	-.0106602
sigma_u	.01734768					
sigma_e	.02797669					
rho	.27771473	(fraction of variance due to u_i)				

F test that all u_i=0: F(6795, 37118) = 1.24 Prob > F = 0.0000

Table 11: Retail fund regression over entire data sample

```
. xtreg expret mom_1 sprtrn, fe

Fixed-effects (within) regression               Number of obs     =    100,703
Group variable: crsp_fundno                     Number of groups  =     14,373

R-sq:                                           Obs per group:
     within  = 0.0611                                         min =          1
     between = 0.2399                                         avg =        7.0
     overall = 0.0644                                         max =          8

                                                F(2,86328)        =    2810.71
corr(u_i, Xb)  = 0.0538                         Prob > F          =     0.0000
```

expret	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mom_1	-.0041568	.0057379	-0.72	0.469	-.0154031	.0070895
sprtrn	-.1732058	.0023117	-74.93	0.000	-.1777366	-.1686749
_cons	-.0120833	.0000991	-121.91	0.000	-.0122776	-.0118891
sigma_u	.01263105					
sigma_e	.03014117					
rho	.14938057	(fraction of variance due to u_i)				

F test that all u_i=0: F(14372, 86328) = 0.82 Prob > F = 1.0000

Table 12: Retail fund regression over entire data sample with expense ratio variable

```
. xtreg expret exp_ratio mom_1 sprtrn, fe

Fixed-effects (within) regression               Number of obs     =    100,703
Group variable: crsp_fundno                     Number of groups  =     14,373

R-sq:                                           Obs per group:
     within  = 0.0647                                         min =          1
     between = 0.0800                                         avg =        7.0
     overall = 0.0654                                         max =          8

                                                F(3,86327)        =    1990.67
corr(u_i, Xb)  = -0.1349                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -.7666804   .0422544   -18.14   0.000    -.8494987   -.6838621
       mom_1 |  -.0039661   .0057271    -0.69   0.489    -.0151911    .0072589
      sprtrn |  -.1718414   .0023085   -74.44   0.000     -.176366   -.1673168
       _cons |  -.0012841   .0006033    -2.13   0.033    -.0024667   -.0001016
-------------+----------------------------------------------------------------
     sigma_u |  .01325232
     sigma_e |  .03008403
         rho |  .16251344   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(14372, 86327) = 0.78                Prob > F = 1.0000
```

Table 13: Retail fund regression in high expense ratio context

```
. xtreg expret exp_ratio mom_1 sprtrn  if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     66,156
Group variable: crsp_fundno                     Number of groups  =      9,824

R-sq:                                           Obs per group:
     within  = 0.0641                                         min =          1
     between = 0.0491                                         avg =        6.7
     overall = 0.0596                                         max =          8

                                                F(3,56329)        =    1285.95
corr(u_i, Xb)  = -0.0994                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -.7144962   .0475622   -15.02   0.000    -.8077184   -.6212739
       mom_1 |  -.0134205   .0070786    -1.90   0.058    -.0272946    .0004537
      sprtrn |  -.1885183   .0031658   -59.55   0.000    -.1947232   -.1823134
       _cons |  -.0018185   .0008456    -2.15   0.032    -.0034759   -.0001611
-------------+----------------------------------------------------------------
     sigma_u |  .01606792
     sigma_e |  .03325626
         rho |  .18925829   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(9823, 56329) = 0.74                 Prob > F = 1.0000
```

Table 14: Retail fund regression in high expense ratio context without expense ratio variable

```
. xtreg expret mom_1 sprtrn  if highlow==1, fe

Fixed-effects (within) regression               Number of obs     =     66,156
Group variable: crsp_fundno                     Number of groups  =      9,824

R-sq:                                           Obs per group:
     within  = 0.0603                                         min =          1
     between = 0.3100                                         avg =        6.7
     overall = 0.0682                                         max =          8

                                                F(2,56330)        =    1808.87
corr(u_i, Xb)  = 0.0773                         Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       mom_1 |  -.0135425   .0070927    -1.91   0.056    -.0274443    .0003593
      sprtrn |  -.1905767   .0031691   -60.14   0.000    -.1967882   -.1843653
       _cons |  -.0143565   .0001362  -105.44   0.000    -.0146234   -.0140896
-------------+----------------------------------------------------------------
     sigma_u |  .01499479
     sigma_e |  .03332252
         rho |  .16839277   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(9823, 56330) = 0.72                 Prob > F = 1.0000
```

Table 15: Retail fund regression in low expense ratio context with expense ratio variable

```
. xtreg expret exp_ratio mom_1 sprtrn  if highlow==0, fe

Fixed-effects (within) regression               Number of obs     =     34,547
Group variable: crsp_fundno                     Number of groups  =      5,167

R-sq:                                           Obs per group:
     within  = 0.0676                                         min =          1
     between = 0.0062                                         avg =        6.7
     overall = 0.0117                                         max =          8

                                                F(3,29377)        =     709.62
corr(u_i, Xb)  = -0.7437                        Prob > F          =     0.0000

------------------------------------------------------------------------------
      expret |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   exp_ratio |  -5.214463   .3131084   -16.65   0.000     -5.82817   -4.600756
       mom_1 |   .0270596   .0096127     2.81   0.005     .0082182     .045901
      sprtrn |  -.1238878   .0028888   -42.88   0.000      -.12955   -.1182255
       _cons |    .031374   .0023386    13.42   0.000     .0267902    .0359578
-------------+----------------------------------------------------------------
     sigma_u |  .01909807
     sigma_e |  .02195659
         rho |  .43070882   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(5166, 29377) = 1.38                 Prob > F = 0.0000
```