The Business Media and Mutual Fund Risk Shifting

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Abstract

This paper investigates the impact of the business media coverage of fund holdings on mutual fund risk-shifting in stock holdings. We capture managers' ex-ante risk preferences, by using holdings-based risk-shifting measures. We document that the business media decreases both across-year risk-shifting and intra-year risk-shifting activities. More negative news sentiment reduces risk-shifting. The association between the business media and risk-shifting is chiefly robust among managers with high agency issue-motivated risk-shifting incentives, such as managers who have poor past performance, or face a more convex flow-performance relationship or are less experienced. The reduction effect of the media on risk-shifting is more pronounced in bearish markets where employment risk is dominant compared to a bullish market where compensation incentives are dominant. Funds with greater business media coverage also have lower total risk exposure. Conclusively, the business media serves as a vital alignment mechanism and has necessary implications for mutual fund managers and investors.

JEL Classifications: G11, G20, G23

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1.0 Introduction

For decades, the mutual fund industry has risen to become one of the most professionally managed investment instruments for sophisticated and unsophisticated investors. Theoretically, in designing and constructing portfolios for their clients, managers fundamentally determine the portfolio's risk based on the investors' risk preferences and return expectations. But in practice, the risk of investors' portfolios is changed by fund managers based on their own utility functions and not solely on the investors' specific risk-return needs. Most portfolio managers' contract has their variable compensation dependent on the relative fund performance to their benchmark. Managers are not penalized for underperformance relative to benchmark since these contracts are asymmetric. Therefore, managers have incentives to shift the risk of their funds to maximize the value of their personal compensation, manipulate tax or impress investors (Chevalier and Ellison (1997), Huang, Sialm and Zhang (2011)). This leads to a classical agency problem. This research enshrines how the business media coverage of fund holdings affects mutual fund risk-shifting behavior in stock holdings. In this paper, the ultimate objective is to analyze how the business media impacts mutual fund risk changes, mainly where these risk shifts are agency issues induced.

Prior literature has documented much evidence of the convex relationship between mutual fund flows and performance. Fund flows are more sensitive and respond robustly to superior performance, whereas fund flows are less sensitive and respond poorly to poor performance.[1] Agency conflicts between fund managers and investors usually rise from this convex flow-performance relationship, which creates inducements for managers to engage in extreme risk-shifting activities.[2] Huang, Sialm and Zhang (2011) document the detrimental effect of agency-issue motivated risk-shifting on fund performance and the enormous costs imposed on investors. The business media can serve as a critical mechanism in reducing agency costs by minimizing information asymmetry between a firm's management and the external constituents and inflicting reputational costs on firm managers that act contrary to investors' interest.[3] This view primarily asserts that the business media shed more light on issues that would otherwise be less salient to the investors (both individual and institutional) and infers that, in addition to reflecting the firm

[1] For more, see, Chevalier and Ellison (1997); Sirri and Tufano (1998); Huang, Wei and Yan (2007).

[2] See, Brown, Harlow and Starks (1996); Chevalier and Ellison (1997); Koski and Pontiff (1999); Busse (2001); Basak, Pavlova and Shapiro (2007); Kempf and Ruenzi (2008); Kempf, Ruenzi and Thiele (2009); Hu, Kale, Pagani and Subramanian (2011); and Schwarz (2012)

[3] Refer to, Miller (2006); Dyck, Volchkova and Zingales (2008); Joe, Louis and Robinson (2009); Bushee, Core, Guay and Hamm (2010); Liu and McConnell (2013); Dai, Parwada and Zhang (2015); You, Zhang and Zhang (2018); Baloria and Heese (2018)

manager's actions, the business media can also influence the manager's behavior. Mutual funds as institutional investors also consider the media coverage of stock holdings in their trade and investment decisions (Fang, Peress and Zheng (2014); Solomon, Soltes and Sosyura (2014)). Therefore, the business media coverage of funds' holdings can dampen funds' sensitivity of risk-shifting to agency issue motivated risk-shifting incentives and can also lessen the convexity of the option-like reward structure. Ceteris paribus, we henceforth expect that greater business media of funds' holdings to be associated with lesser fund risk-shifting in stock holdings, and this is particularly true when agency issue motivated risk-shifting incentives are strong. The business media may influence not only the shift in fund risk but may also affect the level of fund risk. These two effects are mainly due to agency conflicts inherent in any principal-agent relationship. The shift in fund risk effect usually occurs through the conduit of convex reward incentives as discussed, whereas the level of fund risk effect is through the channel of managerial risk aversion. Business media increases investor flows sensitivity to fund performance; therefore, where a portfolio manager is risk-averse, she would lower the level of fund risk. Holding other things constant, we also expect a negative association between the business media and fund risk level.

We begin our analysis by first examining the association between the business media and fund risk-shifting. We construct two measures (one for the main analysis and the other for robustness check) of risk-shifting using mutual fund holdings. These measures capture fund managers' intended changes in portfolio risk and not changes in realized risk. Due to unexpected changes in portfolio risk resulting from exogenous market conditions, the realized risk levels, which are usually computed using fund return data series, can significantly deviate from the intended risk-shifting of the fund manager (Kempf, Ruenzi and Thiele (2009); Huang, Sialm and Zhang (2011)). We follow Huang, Sialm and Zhang (2011) to construct the main measure called *Across-Year Risk Shifting*. This is calculated by taking the annual average of the difference between the intended volatility of the most recently disclosed fund holdings and the volatility of the fund's actual returns, both estimated over the prior 52 weeks. Following Kempf, Ruenzi and Thiele (2009), we construct the second measure for robustness called *Intra-Year Risk Shifting*. This is calculated as the difference between the intended risk in the second half of the year and the realized portfolio risk in the first half of the year. These two measures have positive (negative) values where the manager intends to increase (decrease) the risk of the portfolio. Thus, a positive risk-shifting measure implies that a mutual fund increases its portfolio risk either by concentrating its portfolio more or by holding assets with higher risk levels.

We document that as the business media coverage increases for a fund, both the *Across-Year Risk Shifting* and *Intra-Year Risk Shifting* measures decrease. That is to say, mutual fund managers with greater business media coverage of their holdings, ceteris paribus, are associated with a greater decrease in risk-shifting in the subsequent year. This risk reduction effect of the business media is economically substantial and significant. We show that taking into consideration the point estimates, a one-standard-deviation increase in the business media coverage of fund holdings (*News_Count*) is associated with a 0.14 (0.13) decrease in the standard-deviation of A*cross-Year Risk Shifting* (*Intra-Year Risk Shifting*) measures. Furthermore, the aggregate event volume (*News_AEV*) of the business media representing the number of events (excluding neutral ones) for an entity within the fund's holdings yields similar results. Also, based on the point estimates, a one-standard-deviation increase in the business media (*News_AEV*) is associated with a 0.10 (0.15) decrease in the standard-deviation of A*cross-Year Risk Shifting* (*Intra-Year Risk Shifting*) measures. Our findings support the fact that the business media reduces the fund manager's risk-shifting. Moreover, rather than the business media incentivizing the manager's intended decrease in portfolio risk, it mitigates the intended increase in the manager's portfolio risk. Kempf, Ruenzi and Thiele (2009) argue the need to consider bull markets where compensation incentives dominate, and bear markets where employment incentives dominate. We find the media reduction effect on risk shifting to be more robust and higher in magnitude in the bear markets compared to bull markets. We also examine the impact of news sentiment or tone on mutual fund risk-shifting. The news sentiment or tone could be positive, neutral, or negative. We find negative news sentiment or tone to be negatively and significantly related to risk-shifting. The *across-year risk-shifting* measure of funds with more negative news sentiments or tone is about 1.5 times lower than that of funds with more positive news sentiments or tone, with the mean of *across-year risk-shifting* measure being 0.50%. It is safe to say that those fund managers whose holdings receive more negative news sentiments or tone maintain stable risk and engage less in risk-shifting than managers whose holdings receive more positive news sentiments or tone.

Our baseline result establishes the negative association between the business media and mutual fund risk-shifting. Subsequently, we explore the channel through which the business media decreases fund risk-shifting. We then examine whether the business media risk-shifting reduction effect is greater among fund managers who have stronger agency issue-motivated risk-shifting incentives. Following Ma and Tang (2019), we use two proxies in our main examination to capture the fund manager's risk-shifting incentives, namely: (i) the convex relationship of fund's flow-

performance and (ii) the past performance of a fund. Intuitively, fund managers' agency issue-motivated risk-shifting incentives are high when (i) they face a convex flow-performance relationship (Chevalier and Ellison (1997)) and (ii) when they are underperforming peers (Brown, Harlow and Starks (1996)). Our analysis leads us to conclude that the risk-shifting reduction effect of the business media is greater when fund managers' flow-performance relationship is more convex or when fund managers are underperforming their peers. We also find that the negative association between business media and fund risk-shifting is stronger when managers in the mutual fund industry have shorter tenure or when funds are younger. Putting together all these results, we believe that mitigating managers agency-motivated risk-shifting behavior is the substantive mechanism by which the business media influence risk-shifting reduction.

We run a battery of additional tests to verify our baseline results' robustness and the interactional effect of business media and risk-shifting incentives. First, our documented empirical results are robust to different alternative measures of business media coverage. Second, we include time fixed effect and also cluster by funds to cater for unobserved heterogeneities. Third, similar results are obtained where the regressions are estimated with fund manager fixed effects, indicating that unobservable fund manager characteristics are unlikely to drive our results. Lastly, there is a possibility that our results are driven by diverse fund family policies and different fund objective styles; we include fund family and fund objective fixed effects to eliminate this possibility. Our results remain qualitative similar, and unchanged. Furthermore, we examine how the business media affects the level of fund risk exposures. We also hypothesize that a negative association between the business media and the level of fund risk could arise due to managerial risk aversion. Here, we explore the relationship between the business media and the primary measure of fund risk: total risk (the standard deviation of fund returns). We document that funds with a lower level of total risk significantly have greater business media coverage. This piece of findings corroborates and compliments our conjecture that the business media is associated with a greater agency-motivated risk-shifting reduction and the level of the fund's exposure to risk.

Our study is closely related to several strands of literature. First, we add to the literature on managerial risk-shifting in the mutual fund industry. Prior body of literature document that excessive risk-shifting behavior can be observed among fund managers who are implicitly incentivized by their funds' flow-performance relationship's convexity.[4] Huang, Sialm and Zhang

[4] More light is shed on this line of literature in, Brown, Harlow and Starks (1996); Chevalier and Ellison (1997); Koski and Pontiff (1999); Busse (2001); Basak, Pavlova and Shapiro (2007); Kempf and Ruenzi (2008); Kempf, Ruenzi and Thiele (2009); Hu, Kale, Pagani and Subramanian (2011); and Schwarz (2012)

(2011) empirically document that, besides the imposition of costs on fund investors, fund managers' excessive risk-shifting behavior has a negative impact on fund performance. Our paper is the first to examine how the business media affects mutual fund managers' risk-shifting behavior to the best of our knowledge. Our paper also complements the findings of Ma and Tang (2019), where they examine how portfolio manager ownership – that is, "skin in the game" – affects mutual fund risk-taking behavior. Our paper shows that the business media can serve as an important incentive alignment mechanism for fund managers to decide which holdings to increase or decrease risk due to the holdings' media coverage, therefore, alleviating managers' agency issue-motived risk-shifting behavior. Our study has significant implications for mutual fund managers, and investors since they care about fund risk and fund risk-shifting behavior which bears cost and is detrimental to the fund's performance.

Furthermore, we contribute to the literature on business media coverage in portfolio investing. Prior literature shows that the business media can serve as a vital mechanism in minimizing agency costs by reducing information asymmetry that exists between a firm's management and the external constituents and inflicting reputational costs on managers that act contrary to investors interest (for discussion, see, Miller (2006); Dyck, Volchkova and Zingales (2008); Joe, Louis and Robinson (2009); Bushee, Core, Guay and Hamm (2010); Liu and McConnell (2013); You, Zhang and Zhang (2018); Baloria and Heese (2018)). This view primarily emphasizes that the business media throws more light on issues that would otherwise be less salient to the investors (individual and institutional) and infers that, in addition to reflecting the manager's actions, the business media can also influence the manager's behavior. Therefore, the business media can dampen the sensitivity of risk-shifting to agency issue motivated risk-shifting incentives and can also lessen the convexity of the option-like reward structure. Our results are essential to understanding how the business media coverage shapes the average mutual fund manager's risk-shifting behavior. Our evidence on institutional investors adds to the extant literature on institutional investors' investment decisions.

The remainder of this paper is as follows. Section 2 presents prior research works and hypothesis development. Section 3 describes our data, variable construction, and summary statistics. Section 4 presents the impact of the business media on mutual fund risk-shifting. Section 5 presents the mechanism through which the business media relates to risk-shifting reduction. Section 6 presents an analysis of the relationship between the business media and the fund's overall risk exposure. Section 7 presents robustness tests. Section 8 concludes the paper.

2.0 Prior Literature and Hypothesis Development

2.1 Mutual Fund Risk-Shifting

Over time, mutual funds substantially change their risk exposure. Risk shifting may be caused by agency-prone fund managers who trade to increase their personal compensation or ill-motivated trades of unskilled managers. On the other hand, risk shifting may occur where superior fund managers take advantage of their stock selectivity and market timing skills while trading. There is more literature supporting the former than the latter since risk-shifting behavior is harmful to investors. Mutual funds as delegated portfolio management may shift their risk levels as a result of agency issues. Prior literature document a convex flow-performance relationship, where funds with superior performance do attract extra flows from investors and poor performing funds are not penalized for poor performance homogenously (Chevalier and Ellison (1997), Sirri and Tufano (1998), Huang, Wei and Yan (2007)). Mutual fund managers can be induced by this convex flow-performance relation to tactically shift risk levels to attract extra fund flows (Brown, Harlow and Starks (1996), Chevalier and Ellison (1997), Koski and Pontiff (1999), Busse (2001), Basak, Pavlova and Shapiro (2007), Kempf and Ruenzi (2008), Kempf, Ruenzi and Thiele (2009), Elton, Gruber, Blake, Krasny and Ozelge (2010), Hu, Kale, Pagani and Subramanian (2011), and Schwarz (2012)). Fund managers are also induced to manipulate their performance numbers by simply changing their risk levels (Ingersoll, Spiegel, Goetzmann and Welch (2007)).

Risk shifting may not necessarily be harmful to investors where mutual fund managers are motivated to shift risk to competitively attract extra money flows. Suppose we should hold constant fund expenses and performance levels. In that case, investors should be indifferent concerning where their monies are allocated to since only the competition across various funds is affected by risk-shifting. Next, risk-shifting may indicate superior skill among managers since it is associated with how active funds' investment strategies are. Literature also shows that more active mutual fund managers have superior investment ability among peers (Kacperczyk, Sialm and Zheng (2005), Cremers and Petajisto (2009)). If risk shifting is beneficial indeed to fund investors, then it means fund risk shifters outperform peers. Because in active management, skilled funds may utilize their stock selection and market timing skills by changing their portfolio composition, therefore leading to changes in their risk exposure as an unintended consequence.

To understand the performance consequences of managers risk-shifting behavior and its impact on fund investors, Huang, Sialm and Zhang (2011), using a holding-based measure of risk shifting, sheds light on the economic motivations and mechanisms behind risk-shifting behavior and document that funds that increase risk or shift risk more underperform funds that maintain

relatively stable risk levels over time, pointing to the conclusion that risk shifting is either motivated by agency issues and a signal for inferior managerial ability. They also explain that conditional on risk shifters' economic motivations; their performance consequences may vary. Agency-induced risk-shifting behavior will result in inferior performance for risk-shifting funds. Unskilled managers who are more likely to shift risk due to changes in their investment strategies are expected to perform even worse. But where skilled managers take advantage of their stock selectivity and market timing skills by reconstructing their portfolio composition, one would expect stellar performance from risk-shifting funds.

Various incentives impact the risk-shifting behavior of fund managers. Literature has extensively examined and explored compensation incentives that arise from the convex flow-performance relation. Kempf, Ruenzi and Thiele (2009), using a holding-based measure, jointly examine the impact of compensation incentives and employment incentives on risk-shifting decisions. They find that contingent on the comparative strength of fund managers' employment and compensation incentives, managers accordingly shift their risk in response to their mid-year performance. They also find that, in the bull markets where compensation incentives are more imperative, mid-year losers increase their risk more than mid-year winners. The opposite is true in bear markets, where employment incentives are more important. Brown, Harlow and Starks (1996) are the first to document and examine mutual fund managers' risk-taking incentives using an annual tournament setting. They examine the implicit compensation incentives resulting from a positive convex association between fund past performance and inflow of new money into the fund. Consistent with their main prediction, they find that interim winners (losers) shift their investment portfolios to increase risk by a lesser (greater) degree. They find this effect more pronounced where investors' awareness is drawn to relative performance and the increment in the number of new funds in the industry.

Some literature has questioned Brown, Harlow and Starks (1996). In a study, Chevalier and Ellison (1997) document that the relationship between fund flows and performance is non-linear. Given this relationship, they conclude that the incentive to shift risk is more complex than what Brown, Harlow and Starks (1996) hypothesized. They hypothesize that funds with performance above the market will increase risk, whereas funds underperforming the market will decrease risk since these funds do not want to risk being one of the worst funds. They also perform a time-series analysis and find risk-taking to be positively associated with past performance. Busse (2001) also challenged the empirical results by Brown, Harlow and Starks (1996), especially the

negative association between first period returns and successive risk shifts. Busse (2001) finds that these conclusions made are a result of data selection issues. Comparing daily data to monthly data, daily returns yield much more efficient fund volatility estimates, which also yields hugely different inferences about fund managers' behavior. In specific, managers that are underperforming increase their risk relative to better-performing managers using monthly data, but this disappears using daily data. The difference between daily results and monthly results is from the monthly volatility estimates' biases attributable to return autocorrelation.

Using regression analysis, Koski and Pontiff (1999) document a negative relation between the subsequent shift in risk and interim performance, in line with the tournament hypothesis. Shu, Sulaeman and Yeung (2012) study the effects of local religious beliefs on mutual fund risk-taking behaviors. They find that funds domiciled in high Catholic or low Protestant areas have significantly higher fund returns volatility. They document that risk-taking related to local religious beliefs are displayed in more aggressive interim trading, higher portfolio turnover, higher portfolio concentrations, and more tournament risk-shifting behaviors, but not over-weighting risky individual stocks. In a current study, Ma and Tang (2019) examine the effect of portfolio ownership (i.e., “skin in the game”) on mutual fund risk-taking. They document that portfolio manager ownership decreases both across-year risk-taking and intra-year risk-taking activities. This risk reduction given portfolio ownership is especially strong among managers having high agency issue-motivated risk-taking incentives. Our paper examines the relationship between the business media and mutual fund risk-shifting activities in the same spirit, where the business media serves as an alignment mechanism and has important implications for the mutual fund manager and investors.

2.2 Business Media

The business media play crucial roles in the capital market as a corporate monitor and an information intermediary. Regarding the corporate governance role of the business media, Miller (2006) investigates the business media role as a monitor or “watchdog” for accounting fraud. Miller (2006) finds that the business media plays the role of a monitor by rebroadcasting information from other information intermediaries such as auditors, analysts, and lawsuits while conducting original analysis and investigation. Articles published by the business media built on original analysis carry and convey new information to market players. The conclusion is that the business media plays a role in detecting accounting fraud and bring such information to the public’s attention. Dyck, Volchkova and Zingales (2008) document the following assertions. First,

the business media mirrors reality and can significantly impact reality itself and specific firm corporate governance. Second, the effect of the business media can be economically large. Joe, Louis and Robinson (2009) examine the impact of the business media on several economic agents' behavior by analyzing how the business media exposure of board ineffectiveness impacts corporate governance, security prices, and investor trading behavior. Their results show that the business media coverage of (noisy) information has significant economic consequences. Specifically, the business media's exposure of board ineffectiveness ensures that the targeted agents take corrective actions and improve shareholder wealth. Liu and McConnell (2013) investigate the role of the business media in corporate governance, especially in managers' capital allocation decisions. They document that in making corporate capital allocation decisions, managers have reputational capital at risk. The level and tone of the business media coverage can result in a reputational cost to managers engaging in value-reducing acquisitions. The business media play a role in aligning both shareholders' and managers' interests since most value-reducing acquisition attempts by managers are more likely to be abandoned.

Dai, Parwada and Zhang (2015) also examine the corporate governance role of the business media. They show that the business media by broadcasting news on past insiders' trades accessible from regulatory filings decreases insiders' future trading profits. They identified three economic channels underpinning the disciplining effect of the business media dissemination: information asymmetry reduction, litigation risk concerns, and the impact on insiders' personal wealth and reputation. You, Zhang and Zhang (2018) distinguish between state-controlled and market-oriented business media and conclude that market-oriented business media are more accurate, more critical, timelier, and more comprehensive than those controlled by the state. Furthermore, only market-oriented business media have a significant impact on corporate governance. Baloria and Heese (2018) propose that the business media plays a critical role in shaping firms' reputational capital. Managers alter their behavior to maximize reputational capital after following developments in the business media. Since bad news can reduce managerial reputational capital, managers try to curtail the cost of bad news revelation. Therefore, the media's corporate governance role is an alignment mechanism between managers' and shareholders' interests. Managers shift risk for their personal gains. This paper examines how the business media shapes fund managers' risk-shifting activities to align managerial interest with shareholders.

The business media also plays a vital role as an information intermediary. The business media is probably the widest disseminated among all other information intermediaries, reaching

investors, managers, regulators, and many other market players. Bushee, Core, Guay and Hamm (2010) examine the business media serving as an information intermediary. Through journalism activities, the business media can create new information and disseminate other information, possibly shaping firms' information environments. They find that greater business coverage lessens information asymmetry surrounding earnings announcements. Investors' cognizance concerning financial assets is improved through the business media coverage, and the media is associated with lower capital cost (Fang and Peress (2009)). The business media can curb the information asymmetry between investors and firms and lessen the cost of information acquisition (Tetlock (2010)). The trading behavior of individual investors are influenced by the business media (Barber and Odean (2008), Engelberg and Parsons (2011)). Peress (2014) also demonstrates how the business media advances information dissemination to investors and improves stock market efficiency by integrating information into stock prices. Kacperczyk and Seru (2007) document that a decline in a fund manager's skill is directly related to how responsive the fund manager's portfolio allocations are to public information changes. Fang, Peress and Zheng (2014) demonstrate how media coverage of stocks affects mutual funds' trading and performance.

2.3 Hypothesis Development

Mutual funds are structured purposefully according to the risk and expectation of investors. But in practice, investors' portfolios risk is changed by fund managers based on their own utility functions and not exclusively on the investors' risk preferences and return expectations. Majority of portfolio managers' contract has their variable compensation dependent on the relative fund performance to their benchmark. These managers are not penalized for their underperformance relative to benchmark since these contracts are asymmetric. Therefore, managers have incentives to shift the risk of their funds to maximize the value of their personal compensation, manipulate tax or impress investors (Chevalier and Ellison (1997), Huang, Sialm and Zhang (2011)). This leads to the classical agency problem from the convex relation between fund flow and performance, resulting in managers' excessive risk-shifting activities.[5] Prior literature hypothesizes that risk shifting is harmful to investors. Huang, Sialm and Zhang (2011) document the negative effect of agency-issue motivated risk-shifting on fund performance and the enormous costs imposed on investors.

[5] For much detailed discussion, see, Brown, Harlow and Starks (1996); Chevalier and Ellison (1997); Koski and Pontiff (1999); Busse (2001); Basak, Pavlova and Shapiro (2007); Kempf and Ruenzi (2008); Kempf, Ruenzi and Thiele (2009); Hu, Kale, Pagani and Subramanian (2011); and Schwarz (2012)

The business media plays a very strategic role in the capital market as a corporate monitor. The business media can serve as a critical monitoring mechanism in reducing agency costs by minimizing information asymmetry between a fund's management and the external constituents (which includes funds) and inflicting reputational costs on managers that act contrary to investors (individual and institutional) interest (for further discussion, see, Miller (2006); Dyck, Volchkova and Zingales (2008); Joe, Louis and Robinson (2009); Bushee, Core, Guay and Hamm (2010); Liu and McConnell (2013); You, Zhang and Zhang (2018); Baloria and Heese (2018)). This view largely asserts that the business media shed more light on issues that would otherwise be less salient to the investors and infers that, in addition to reflecting the firm manager's actions, the business media can also influence the firm manager's behavior. The fund manager's behavior can be influenced by observing the media coverage of her stock holdings (Fang, Peress and Zheng (2014); Solomon, Soltes and Sosyura (2014)). Therefore, we propose that greater business media coverage of funds' stock holdings is associated with a reduction in fund managers' risk shifting behavior in stock holdings. This leads to our main hypothesis:

H1 *– Greater business media coverage of funds' stock holdings reduces the risk-shifting behavior of fund managers in stock holdings.*

The counterfactual to our central hypothesis is that the business media does not affect managers' risk-shifting behavior. If the business media only rebroadcast already existing information without adding new information, it should not enhance firms' information environment and not influence fund managers' behavior. We consider this assertion to be the null hypothesis.

The business media informational content can either be positive, neutral, or negative. We probe further to determine if risk-shifting behavior responds to the informational content and sentiment in the news articles. Since positive media coverage enhances a firm's performance, we postulate that funds' stock holdings with more negative business media coverage reduce much more their risk-shifting activities. We state the hypothesis as follows:

H2 *– Greater negative media coverage of funds' stock holdings reduces much more robustly the fund managers' risk-shifting in stock holdings.*

Contrary to this hypothesis is that more positive media coverage reduces managers' risk-shifting activities. Another possible outcome could be that the news articles' informational content and sentiment play no vital role in managers' risk-shifting behavior.

We further identify the economic mechanism underlying the effect of the business media on managerial risk-shifting behavior. We examine whether the effect of the business media varies with the degree of agency issue-motivated risk-shifting incentive. If the business media serves to align both managers' and investors' interests, therefore alleviating the conflict of interest, one would expect the business media's effect to be much stronger among managers with high incentives to engage in agency-motivated risk-shifting behavior. Thus, the hypothesis is formally stated as follows:

H3 *– The effect of the business media coverage of funds' holdings is much stronger among fund managers with high incentives to engage in agency-motivated risk-shifting.*

The business media plays a vital role as an incentive alignment mechanism, therefore keeping the interests of both the managers and investors at par. When both the managers' and investors' interests are already aligned, the business media's effect should be minimal. But, when these interests are not aligned and managers engage much more in agency-induced risk-shifting, we expect the impact of the business media to be more pronounced.

Analogous to the association between the business media and risk-shifting, the relationship between the business media and the level of total risk exposure could also be attributable to agency conflict inherent in any relationship existing between principal and agent. A risk-averse manager may always want to reduce or stabilize the level of the fund's total risk exposure to protect her personal gains or reputational capital. As a result, we again expect a negative association between business media coverage and the fund's total risk exposure level. We state our hypothesis as follows:

H4 *– Greater business media coverage of funds' stock holdings reduces the level of total risk exposure of fund managers.*

That is to say, mutual fund managers with greater business media coverage of their holdings, ceteris paribus, are associated with reducing their total fund risk exposure.

3.0 Data, Variables, and Descriptive Statistics

3.1 Data

3.1.1 Mutual fund and Portfolio Holdings

Our sample construction begins with the universe of actively managed U.S. open-end equity mutual funds covered by the Center for Research in Security Prices (CRSP) Mutual Fund Survivorship-bias-free Database. We retrieve data on monthly fund returns and other fund characteristics from the CRSP database. Our timeline spans from 2000 to 2017. This choice is driven by the availability of media coverage data in RavenPack, which begins from the year 2000. We focus primarily on active mutual funds that invest mainly in U.S. equities. Therefore, we exclude index funds from our sample. We exclude international funds, balanced funds, bond funds, sector funds, money market funds, and all other funds that do not principally invest in U.S. common equity following Kacperczyk, Sialm and Zheng (2008).[6] In addressing the incubation bias documented by Evans (2010), we eliminate observations before the reported fund inception date on CRSP, funds whose total net assets are less than $10 million, and funds with missing names. For a fund to be qualified for consideration in our analysis, it must also meet the requirement of having at least ten stock holdings.

We also obtain data on fund holdings from the Thomson Reuters Institutional Holdings database, which collects and compiles institutional investors' portfolio disclosures filed with the Securities and Exchange Commission (SEC).[7] With the help of the MFLINKS table developed by Russ Wermers available on Wharton Research Data Services (WRDS), we match mutual funds to portfolio holdings information. The “wficn” identifier from MFLINKS is the primary unit of fund analysis. We combined multiple “CRSP fundno” share classes into a single wficn, since CRSP fundno lists each share class as a separate series. We compute fund-level variables by aggregating across the different share classes available and remove duplicated funds. In specific, each fund's TNA is estimated as the sum of TNAs of its share classes. The age of the fund is calculated as the oldest of its share class. We use TNA-weighted average over the share classes for all other fund characteristics. After we have matched the two samples, additional filters are imposed to remove observations with errors. We use the funds’ portfolio holdings data to construct the holdings-based risk-shifting measures used in this research.

[6] We exclude funds with any of the following Thomson Reuters Investment Objective Codes: International, Municipal Bonds, Bond and Preferred, Balanced, Metals, Unclassified, and funds for which this information is missing. Using the portfolio composition data provided by CRSP, we exclude funds that on average invest less than 80% or more than 105% in common equity.

[7] SEC mandates the filing of all equity positions more than either 10,000 shares or $200,000 in market value for all institutions with over $100 million under discretionary management.

3.1.2 Business Media

We obtain the business media coverage data from RavenPack, a leading global news analytics company, which provides real-time news and sentiment analytics in finance. In partnership with Dow Jones (DJ), RavenPack has access to the complete DJ news archives comprising all DJ Newswires, Wall Street Journal (WSJ), Barron's, and MarketWatch articles with specific dates and timestamps. RavenPack gathers news articles worldwide from business publishers, blog sites, national and local news, government and regulatory updates, press releases, and corporate news services. RavenPack database has been recently used in top finance and accounting research (see, Kolasinski, Reed and Ringgenberg (2013); Drake, Guest and Twedt (2014); Dang, Moshirian and Zhang (2015); Twedt (2016); Bushman, Williams and Wittenberg-Moerman (2017); You, Zhang and Zhang (2018)). These news analytics data are used in quantitative and algorithmic trading. It uses proprietary algorithms in processing news articles and press releases into machine-readable content.

RavenPack database provides a relevance score for each news article that ranges from 0, not relevant article, to 100, very relevant article, showing to what degree the firm is the focus of the news article. Where a company plays a central role in the main framework of the story and the type of article can be identified, then relevance score is 100, but where a company is passively mentioned and does not play a central role, then it gets a low relevance score. RavenPack also provides another index called event novelty score, which ranges from 0, not novel article, to 100, very novel article, representing how novel a news article is. Our analysis limits news articles to those with a novelty score of 100 to filter out redundant news releases similar to Engelberg, Reed and Ringgenberg (2012), where an algorithm is applied to achieve the same result. Like Keim, Massa and von Beschwitz (2018), we also limit news articles to those with a relevance score of 100 to reduce noise.

3.2 Variables

3.2.1 Business Media Variables

We construct two main business media variables for our analysis: News_Count and News_AEV (Aggregate Event Volume). News_Count represents the natural log of the average number of news articles received by a fund's portfolio holding of stocks in a year. News_AEV (Aggregate Event Volume) is the natural log of the average number of events for an entity (excluding neutral ones) using RavenPack's proprietary expert consensus methodology computed over a 91-day rolling window received by a fund's portfolio holding of stocks. We also constructed two high news indicator variables, namely: High_News_Count and High_News_AEV. We define

High_News_Count as a dummy variable equal to 1 if a fund's News_Count is above the median number and 0 otherwise. High_News_AEV is also a dummy variable equal to 1 if a fund's News_AEV is above the median number and 0 otherwise.

3.2.2 Holdings-Based Risk-Shifting Measure

Prior literature usually compares the standard deviations of mutual fund return series over two non-overlapping time periods to measure mutual fund risk changes. But here, we want to explore and examine the fund manager's intended risk changes of a portfolio, which can significantly deviate from the realized risk changes because of exogenous variations in the risk of constituent stocks. To exclude unexpected changes in fund manager's portfolio risk resulting from exogenous market conditions by active management, we focus more on the manager's intended portfolio risk changes. We construct the holdings-based risk change measure for our analysis.

Inspired by Huang, Sialm and Zhang (2011), we construct the measure based on fund portfolio holdings called *Across-Year Risk-Shifting*. This measure is defined as the difference between the recent portfolio holdings volatility based on a fund's most currently disclosed holdings and the past realized portfolio volatility based on its formerly disclosed holdings. The measure is constructed as follows:

$$Across\text{–}Year\ Risk\text{–}Shifting_{j,t} = \sigma_{j,t}^{H} - \sigma_{j,t}^{R} \quad (1)$$

where *j* represents fund and *t* denotes time (i.e., quarter). We calculate the volatility of the current portfolio of fund *j* at quarter *t*, $\sigma_{j,t}^{H}$, we first construct a hypothetical portfolio over the previous 52-week period ending at the prior quarter-end *t-1* that holds the most recently disclosed fund's position. We then calculate the standard deviation of the sample return series. In detail, we use the constant portfolio weight as of quarter *t* and returns of the asset over the previous 52-week period, and then first calculate the weekly return series of the hypothetical portfolio. Afterward, we calculate the standard deviation of the hypothetical portfolio return series. Next, we calculate the volatility of the realized returns, $\sigma_{j,t}^{R}$, over the same 52-week period based on the prior quarters' disclosed holdings, we calculate the realized portfolio returns series first. We then calculate the standard deviation of this realized sample portfolio return series. To arrive at a given fund's annual measure of risk-shifting, we take the difference between the volatility of the recent holdings and the volatility of the past realized returns and compute the average across quarters. Furthermore, this risk-shifting measure is annualized by multiplying it by the square root of 52 and are presented in yearly percentage points.

Since our focus is on divorcing the intended risk-shifting behavior from the unintended portfolio risk changes, which is a product of market conditions, we use this holdings-based risk change measure which is constructed by estimating the volatility of the recent portfolio holdings and the volatility of the realized over similar time periods. Where the fund managers do not rebalance their portfolios over the estimation window, the measure equals 0. The measure also has positive and negative values. Positive values occur where the most currently disclosed holdings are riskier than the past fund holdings, and negative values vice versa.

3.2.3 Overall Risk Exposure

We also examine the level of the fund's overall risk exposure. We use daily returns net of fees to capture this exposure, *Total Risk*. This measure is calculated as the annualized standard deviation of the fund return series.

3.2.4 Other Variables

A set of additional variables are included. We control for fund-, manager-, and fund family-specific characteristics in our analysis. *Fund Size* is the total net asset of the fund in millions of dollars across all share classes, *Fund Age* represents the number of years a fund is present in the CRSP equity mutual fund database, *Flow* is the growth rate of assets under management after adjusting for the appreciation of the fund's assets (Sirri and Tufano (1998)), *Turnover* is the turnover ratio of a fund, *Expense* represents a fund's expense ratio, *Number of Stocks* is the count of the number of stocks each fund holds in its portfolio, *Cum.12-Month Ret* is the cumulative net of fee return over the 12-month window in a year, *Team Managed* is an indicator variable that equals 1 if multiple managers manage a fund and 0 otherwise, *Mgr. Tenure* is the length of time that a manager has been at the helm of a mutual fund, *Tracking Error* is the standard deviation of the residuals from regressions of excess fund returns on excess stock market returns over the previous year.

3.3 Descriptive Statistics

Our final sample of mutual funds consists of 3,676 unique open-end domestic equity funds covering about 35,217 fund-year observations. The summary statistics are presented in Table 1. The average (median) fund in our sample manages about 1.66 billion dollars (0.25 billion dollars) in assets, is 22 years old (20 years old), charged an annual expense ratio of 1.2% (1.1%), and experienced an annual turnover of 85.5% (56.0%). The average (median) fund earned a net return of 1.6% (1.4%) and attracted capital flows of 1.7% (0.9%). The average (median) fund in our sample receives business media coverage of holdings - *News_Count (log)* of 5.21 (5.3) and

News_AEV (log) of 9.49 (9.34). We find about 47% receive high *News_Count* above the median, whereas 50% receive high *News_AEV*. Furthermore, we find funds have an average (median) *across-year risk-shifting* measure of 0.51% (0.19%), which is similar in magnitude to Huang, Sialm and Zhang (2011) and Ma and Tang (2019). Therefore, our sample's average fund increases its annualized volatility by about 0.51% during our sample period. Also, we find funds have an average (median) *intra-year risk-shifting* measure of 0.39% (0.33%). These numbers are in harmony with those usually reported in the mutual fund literature.

[Insert Table 1 Here]

4.0 The Business Media and Mutual Fund Risk Changes

We begin our analysis in this section by examining the relationship between the business media and mutual fund risk changes. We then conduct a battery of robustness checks on the baseline results.

4.1 Business Media and Mutual Fund Risk-Shifting

Our baseline analysis is on examining the relationship between the business media coverage and mutual fund managerial risk-shifting. Our estimation is conducted using the following regression model:

$$Risk\text{–}Shifting_{j,t} = \alpha + \beta News_{j,t-1} + \gamma Controls_{j,t-1} + \varepsilon_{j,t} \quad (2)$$

where $Risk\text{–}Shifting_{j,t}$ is the holding-based across-year risk-shifting measure for fund *j* in year *t*. $News_{j,t-1}$ is our main independent variable of interest which represents the business media coverage of fund *j* holdings in year *t-1*, captured by News_Count and News_AEV. The coefficient β captures the association between the business media and fund risk-shifting. Based on previous literature, we included a vector of control variables capturing the fund and manager characteristics that may influence fund risk-shifting behavior. We control for fund size, fund age, flow, turnover, fund past performance (past year's cumulative returns), and manager tenure in accordance with the literature. For instance, Kempf, Ruenzi and Thiele (2009) and Huang, Sialm and Zhang (2011) show that managers with shorter tenure, younger managers, and underperforming funds have much incentive to engage in risk-shifting behavior. We also control for the number of stocks in the portfolio of a fund, expense ratio, and a fund team managed dummy. Kempf and Ruenzi (2008) show that risk-shifting activities are stronger among funds managed by a single manager and funds with higher expense ratios. We also control for fund's tracking error since literature shows higher

fund activeness is an indication of greater managerial skills and, therefore, lowers the incentive for risk-shifting (Huang, Sialm and Zhang (2011), Cremers and Petajisto (2009)). To mitigate potential reverse causality concerns, we measure all independent variables in the prior year-end. We control for year fixed effects and cluster the standard errors at the fund level. Finally, one may argue that certain portfolio managers, fund investment styles, or potential fund family policies may drive our results. We therefore include portfolio manager fixed effect, fund investment style fixed effect and fund family fixed effect to address these concerns. We examine our first hypothesis here.

Our baseline results from equation (2) are presented in Table 2. Consistent with our conjecture, we find that mutual fund managers with greater business media coverage of holdings are associated with greater reduction in risk-shifting activities in stock holdings during the subsequent year. The coefficients on the two business media proxies are negative and statistically significant at 1% level. The coefficient on News_Count in column (1) is -0.560 with a t-statistic of -6.76, whereas News_AEV in column (2) yields -0.160 with a t-statistic of -5.70. Based on the point estimate in column 1 (2), a 1 standard deviation increase in the business media coverage is associated with a 0.143 (0.099) standard deviation decrease in the *across-year risk-shifting* measure in terms of economic significance. Simply put, a 1 standard deviation increase in News_Count (News_AEV) in column 1 (2) is associated with 0.560*0.784=43.9% (0.160*1.899=30.4%) reduction in *across-year risk-shifting*. These results still hold and are statistically and economically significant even after controlling for fund objective, fund manager, and fund family fixed effects in columns (3) and (4) of Table 2. We document similar results reported in Appendix B Table 1, where the *across-year risk-shifting* measure is constructed as a ratio instead of difference. Furthermore, we compute the across-year risk-shifting measure using 36 monthly returns instead of the weekly returns used in our main analysis. We find similar results presented in Appendix B Table 2. As a result of the 2008 financial crisis and the recovery afterwards, there are general trends in aggregate market volatility. But the holdings-based risk shifting measures are constructed to sieve out the effect of aggregate market volatility, and we also control for year fixed effects in all regressions. Nonetheless, we address the remaining concerns of market volatility by estimating the regressions separately for each year in our sample period. We find similar results in nearly all years. These results are reported in Appendix B, Table 3.

[Insert Table 2 Here]

4.2 Additional Tests

Our baseline results show a negative association between the business media coverage of fund stock holdings and mutual fund risk-shifting in stock holdings. In this section, we carry out additional tests to assess the robustness of our baseline results.

4.2.1 Bull and Bear Markets

In examining fund managers' risk taking, Kempf, Ruenzi and Thiele (2009) argue the need to consider both the compensation incentive and the employment risk. Managers investment decisions are affected by compensation incentive because managers want to earn high compensation and also affected by employment risk because they want to keep their jobs and do not want to be laid off. Compensation incentives are weak in bear markets whereas employment incentives are strong in the bear markets. In contrast compensation incentives are strong in bull markets whereas employment incentives are weak in bull markets. Kempf, Ruenzi and Thiele (2009) document that, in the bull markets where compensation incentives dominate, underperforming fund managers increase their fund risk more than their peers. In the bear markets where employment incentives dominate, underperforming fund managers increase their fund risk less than their counterparts. Their findings show that ignoring the interplay between compensation incentives and employment incentives through the proxy of the bull and bear markets can easily yield misleading results. Here, we follow Kempf, Ruenzi and Thiele (2009) to define all years as to whether compensation or employment incentives will be the main driver of managerial behavior. The return on the stock market which is estimated as the value-weighted index of all securities traded at the NYSE, Amex and Nasdaq proxies for relative importance of these two incentives. Where the midyear market return is positive (bull markets), it is assumed compensation incentives are more essential and where the midyear market return is negative (bear markets), it is assumed employment incentives are more essential, respectively. Having established that media coverage of fund holdings reduces mutual fund risk shifting in holdings, we next examine to see the relative strength of the media reduction effect on risk shifting in bull markets and bear markets.

After distinguishing the bull markets from the bear markets, we interact these two markets with our media coverage variables. The results are reported in Table 3. First of all, we find all our double interactions (media and markets) to be negatively related to mutual fund risk shifting, with the significance level at 1% throughout columns 1 to 3, expect for column 4 which is at least significant at 10/%. This reinforces our baseline results in Table 2 that media coverage of fund holdings significantly reduces mutual fund risk shifting in their holdings. Secondly, it is interesting

to note that all throughout column 1 to 4 of Table 3, the media reduction effect on risk shifting is slightly higher in magnitude in bear markets compared to bull markets. For instance, from column (1), the coefficient on bear markets interaction is -0.565 (t-statistics = -6.02) whereas bull markets interaction yields -0.551 (-7.94), a difference of 0.017. Columns 2, 3 and 4 also have coefficients on bear markets higher than bull markets. We interpret this to be that the reduction effect of the business media on risk shifting is more pronounce and robust when markets are down and employment risk is dominant (bear markets) compared to when markets are up and compensation incentive is dominant (bull markets). We control for fund characteristics, year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect and we cluster the standard errors at the fund level.

[Insert Table 3 Here]

4.2.2 High Business Media Coverage

In this subsection, we examine two additional business media variables. We construct two high news indicator variables, namely: *High_News_Count* and *High_News_AEV*. We define *High_News_Count* as a dummy variable that is equal to 1 if a fund's *News_Count* is above the median number and 0 otherwise. *High_News_AEV* is also a dummy variable that is equal to 1 if a fund's *News_AEV* is above the median number and 0 otherwise. We examine the relationship between high business media coverage relative to low business media coverage and mutual fund risk-shifting. We present the results in Table 4. We find a negative relationship between high business media coverage and mutual fund risk-shifting. The coefficient estimates on the business media variables are negative and significant at the 1% level. The coefficient estimates on *High_News_Count* in column (1) is -0.375 with a t-statistic of -6.64, whereas *High_News_AEV* in column (2) has an estimate of -0.276 with a t-statistic of -5.08. This evidence reinforces the negative relationship between the business media and risk-shifting established in Table 2.

[Insert Table 4 Here]

4.2.3 Absolute Value of Risk Changes

We examine the relationship between the business media and absolute risk-shifting values, where the shift in risk is regardless of the direction, either an increase or decrease (Ma and Tang (2019)). We present the results in Table 5. We also find a negative relationship between the business media and the absolute value of the risk-shifting measure. The coefficient estimates on the business media variables are all negative and significant at the 1% level. The coefficient on News_Count in column (1) is -0.196 with a t-statistic of -4.90, whereas News_AEV in column (2) has an estimate of -0.120 with a t-statistic of -3.38. This piece of evidence suggests that the negative association between the business media and risk-shifting established in Table 2 is primarily driven by mitigating intended portfolio risk increases (i.e., the risk shift measures being more positive), rather than incentivizing intended portfolio risk decreases (i.e., the risk shift measures being more negative).

[Insert Table 5 Here]

5.0 Tone and Sentiment of News and Mutual Fund Risk Shifting

The business media variables used above bears no sign since it only measures a news article's presence. This section analyzes the impact of news sentiment, or tone on mutual fund risk-shifting behavior. The news sentiment or tone could be positive, neutral, or negative. RavenPack determines each news article's tone, sentiment, or informational content by adopting three proprietary methodologies, i.e., expert consensus, market response, and traditional language analysis. These methodologies result in two significant news sentiment scores: the composite sentiment score (CSS) and the event sentiment score (ESS).[8] These sentiment scores have values ranging from 0, extremely negative tone, to 100, extremely positive tone, where 50 signifies neutral tone. Since we are interested in how the business media coverage of mutual fund holdings affects funds' risk-shifting behavior across their holdings, we use CSS in this study since it focuses on the effect a news article may have on a firm's stock prices. We begin by first eliminating all news sentiments with a 50 (neutral tone) score since we are interested in the impact of only positive and negative sentiments. We consider each fund's holdings over the year and count the number of negative news sentiments relative to positive sentiments. We then create an indicator variable

[8] CSS denotes the effect a news article may have on a firm's stock prices, which is computed on the basis of intraday stock price reactions, modeled empirically by using tick data from a portfolio of nearly one hundred large-cap stocks to ascertain how positive, negative or neutral a news article is. ESS on the other hand is computed based on training sets where financial experts categorize firm-specific events and agreed that these events either convey a positive, neutral or negative sentiment and to what extent. RavenPack shows CSS and ESS scores are highly correlated.

called *Sentiment*, which is equal to 1 if a fund's holdings in a quarter receive more negative news sentiment or 0 otherwise. Our second hypothesis is examined here. We use the following regression model in our estimation:

$$Risk\text{–}Shifting_{j,t} = \alpha + \beta Sentiment_{j,t-1} + \gamma Controls_{j,t-1} + \varepsilon_{j,t} \quad (3)$$

where $Risk\text{–}Shifting_{j,t}$ is the holding-based across-year risk-shifting measure for fund *j* in year *t*. $Sentiment_{j,t-1}$ is our main independent variable of interest, a dummy variable which is equal to 1 if a fund's holdings receive more negative news sentiments relative to positive sentiments or 0 otherwise. We also control for the same set of variables as in our baseline model. We control for time fixed effects and also cluster standard errors at the fund level.

We present the results in Table 6. The coefficient estimates in columns (1) and (2) on the indicator variable of interest, *Sentiment,* are negative and significant at 1%. The coefficient on *Sentiment* in column (1) is -1.807, with a t-statistic of -3.17. After controlling for funds' investment styles, manager's and family fixed effects in addition to year fixed effect and cluster by fund, the coefficient on sentiment is -1.584, with a t-statistic of -3.08. This indicates that the *across-year risk-shifting* measure of funds with more negative news sentiments or tone are about 1.5 times lower than that of funds with relatively more positive news sentiments or tone, with the mean of *across-year risk-shifting* measure being 0.50%. It is safe to say that those fund managers whose holdings receive more negative news sentiments or tone maintain relatively stable risk and engage less in risk shifting than managers whose holdings receive relatively more positive news sentiments or tone.

[Insert Table 6 Here]

6.0 Agency Issue-Motivated Risk-Shifting Incentives and the Effects of the Business Media

In this section, we examine the mechanism through which the business media affects risk-shifting. We investigate whether the effect of the business media varies with the level of agency issue-motivated risk-shifting incentives. Since the business media plays a role in aligning both managers' and investors' interest, we would expect the effect of the business media to be particularly stronger among managers with high incentives to engage in agency-motivated risk-shifting behavior. Our third hypothesis is tested in this section.

6.1 Agency Issue-Motivated Risk-Shifting Incentives

We follow the literature by using two key measures in capturing fund managers' risk-shifting incentives. These measures are: (i) the convex relationship between funds' flow and performance and (ii) the past performance of funds. Fund managers' agency issue-motivated risk-shifting incentives are high when (i) they have a convex flow-performance relationship (Chevalier and Ellison (1997)) and (ii) when they have poor performance relative to their peers (Brown, Harlow and Starks (1996)). We estimate the following regression to test our third hypothesis:

$$Risk\text{–}Shifting_{j,t} = \alpha + \beta_1 News_{j,t-1} \times D_{j,t-1} + \beta_2 News_{j,t-1} \times (1 - D_{j,t-1}) + \beta_3 D_{j,t-1} + \gamma Controls_{j,t-1} + \varepsilon_{j,t} \quad (4)$$

where $Risk\text{–}Shifting_{j,t}$ is the across-year risk-shifting measure for fund j in year t. $News_{j,t-1}$ represents the business media coverage received by the holdings of fund j in year *t-1*. $D_{j,t-1}$ is a dummy variable that takes the value of 1 if (i) fund j has a convex flow-performance relationship and (ii) fund j performs poorly relative to its peers. $Controls_{j,t-1}$ denotes a vector of control variables for fund j measured in year *t-1*, same as those included in equation (2). The coefficient β_1 (β_2) captures the association between the business media and fund risk-shifting when $D_{j,t-1}$ is 1 (0). Here, we are able to isolate and distinguish between the impact of the business media on high agency issue-motivated risk-shifting managers and low or no agency issue-motivated risk-shifting managers. More importantly, we carry out *F*-tests to compare the differences between β_1 and β_2.

First, using the flow-performance convexity relationship as the proxy for risk-shifting incentive, we present the results in Table 7.[9] In line with our conjecture, we find that the coefficient estimate of the indicator variable for the flow-performance convexity relationship is positive and statistically significant at the 1% level, except for column (4), which is significant at the 5% level. This means that a convex relationship between a manager's flow and performance induces such a manager to shift more risk. Our primary interest in this result lies where the evidence shows that the effect of the business media on risk-shifting for the sub-sample of funds having a convex flow-performance relationship is much higher in magnitude than the size of the effect of the business

[9] A fund is said to have a convex flow-performance relationship when the correlation between the fund's flow and past net performance conditional on return being positive is greater than the correlation conditional on return being negative. Similarly, where the coefficients of regressing fund flow on positive returns is greater than the coefficient from regressing flow on negative returns (Ma and Tang (2019)).

media on the sub-sample without convex flow-performance relationship. More importantly, we show that there is a significant difference between β_1 and β_2. We use the *F*-tests shown at the bottom row of the table to show these differences are significant at the 1% level. Principally, we provide robust evidence that the business media significantly reduces risk-shifting among funds having convex flow-performance sensitivity.

[Insert Table 7 Here]

Having established above that business media robustly reduces risk-shifting more among funds having convex flow-performance sensitivity, we next examine their interplay in different markets, taking into consideration bull and bear markets. Kempf, Ruenzi and Thiele (2009) demonstrate the need for individual examination of these two markets since different incentives may dominantly influence managerial risk taking in these two different markets. Where the midyear market return is positive (bull markets), it is assumed compensation incentives are more essential and where the midyear market return is negative (bear markets), it is assumed employment incentives are more essential, respectively. After differentiating the bull markets from the bear markets, we interact these two markets with our media coverage variables and then with convexity. So, we have a triple interaction, which examines the effect of media coverage on risk shifting where the funds have either convex or non-convex flow-performance and the market type being either bull or bear. We also perform F-test to know if there's any difference in the coefficients between convex funds and non-convex funds in bull markets and in bear markets in the presence of media coverage. We report the results in Table 8. First, we find that the business media reduction effect on risk shifting is much pronounced and higher in magnitude in the subsample of funds with convex flow-performance than funds without convexity in both bull and bear markets. Media coverage reduces risk shifting much more in funds with convex flow-performance in both bull and bear markets than in funds with non-convex flow-performance. For instance, in column 1 and in the bull markets, convex funds have a coefficient of -0.636 (t-statistics = -7.82), compared to a coefficient of -0.422 (-7.48) on non-convex funds. Similar story is told in the bear markets where convex funds have higher media reduction effect than non-convex funds. Second, we find the media reduction effect to be higher in magnitude in bear markets for convex funds compared to convex funds in bull markets. Non-convex funds in bear markets also have higher media reduction effect compared to non-convex funds in bull markets. Third, our F-test rejects the null hypothesis that the coefficients on convex and non-convex funds in each market is the same and there's no difference. The differences in coefficients are significantly different at 1%,

as shown by the p-values from the F-tests. Overall, the media reduction effect is more pronounced among convex funds during bear markets and less pronounced among non-convex funds during bull markets.

[Insert Table 8 Here]

Next, we use the fund's past performance as the proxy for risk-shifting incentive, and we present the results in Table 9. Literature shows that most fund managers are evaluated on a three-year window in their compensation (Ma, Tang and GÓMez (2019)). In measuring fund performance, we use the fund's past two years' cumulative return. We create an indicator variable called *Loser*, which is equal to 1 if a fund's past performance is in the bottom quartile and 0 otherwise. In line with our postulation, we find that the coefficient estimate of the indicator variable for poor performance is positive and statistically significant at the 1% level, except for column (2), which is significant at the 5% level. This means that a fund's poor past performance induces the manager to shift more risk. The evidence also shows that the effect of the business media on risk-shifting for the sub-sample of funds having poor past performance is much higher in magnitude than the size of the effect of business media on the sub-sample with better past performance. More notably, we show that there is a significant difference between β_1 and β_2. We use the *F*-tests shown at the bottom row of the table to show these differences are significant at the 1% level. Overall, we provide robust evidence that the business media significantly reduces risk-shifting more among funds having poor past performance. Pieces of evidence in Tables 7 to 10 clearly show that the effect of the business media in reducing risk shifting is specifically stronger among fund managers with greater agency issue-motivated risk-shifting incentives. This is consistent with the notion that the business media helps alleviate agency conflict of interest between managers and investors.

[Insert Table 9 Here]

Since we have documented above a strong evidence that the business media significantly reduces risk-shifting more among funds having poor past performance, we next explore the outcomes in different markets. We follow Kempf, Ruenzi and Thiele (2009) to examine the bulls and bears markets, since these two markets may influence managerial risk shifting differently. We interact these two markets (bull and bear markets) with our media coverage variables and then with loser funds. Basically, we have triple interaction, which examines the media effect on risk shifting where the funds are either losers or non-losers and the market type is either bull or bear. We perform F-test to know if there's any difference in the coefficients between loser and non-loser

funds in bull and bear markets in the company of media coverage. We present the results in Table 10. First, we document that the reduction effect of the business media on risk shifting is much higher in magnitude and pronounced in the subsample of loser funds than non-loser funds in both bull and bear markets. For example, in column 1 and in the bull markets, loser funds have a coefficient of -0.791 (t-statistics = -5.75), compared to a coefficient of -0.483 (-7.82) on non-loser funds. Also, in the bear markets loser funds have higher media reduction effect than non-loser funds. Second, our F-test rejects the null hypothesis that the coefficients on loser and non-loser funds in each market is the same and there's no difference. The differences in coefficients are significantly different at 1% and 10% as shown by the p-values from the F-tests. Put together, the reduction effect of the media is more pronounced among loser funds and less pronounced among non-loser funds.

[Insert Table 10 Here]

6.2 Other Proxy for Agency Issue-Motivated Risk-Shifting Incentives

We consider another proxy for fund managers' agency issue-motivated risk-shifting incentives in this section. We examine the fund manager's tenure in the mutual fund industry as a proxy for risk-shifting incentive. We repeat the same analysis in Tables 7 and 9 here. Literature shows that a fund manager's agency issue-motivated risk-shifting incentive is higher when the manager has a shorter tenure in the fund industry. Kempf, Ruenzi and Thiele (2009) document that managers with shorter tenure are more responsive to tournament incentives, and once they are performing poorly, they tend to take more risk. We conjecture that the business media's effect on risk-shifting will be stronger among managers with shorter tenure.

We create a dummy variable called *Short experience*, which is equal to 1 if a fund manager has tenure below the industry median and 0 otherwise. We present the results in Table 11. In line with our conjecture, we find that the coefficient estimate of the indicator variable short experience is positive and statistically significant at the 5% level only for column (1). This means that a manager with short experience has more incentive to shift more risk. The results also show that the effect of the business media on risk-shifting for the sub-sample of fund managers with shorter experience is much higher in magnitude than the size of the effect of business media on the sub-sample with long experience. More especially, we show that there is a significant difference between β_1 and β_2. We use the *F*-tests shown at the bottom row of the table to show that some of these differences are significant while others are not. Taken together, we provide robust evidence that the business media significantly reduces risk-shifting among fund managers with shorter

experience. The evidence reinforces that the effect of the business media in reducing risk shifting is specifically stronger among fund managers with greater agency issue-motivated risk-shifting incentives. Furthermore, we perform a triple interaction which examines the effect of media on risk shifting where the fund manager has either short or long experience in the fund industry and the market type is either bullish or bearish. We perform F-test to examine if there's any difference in the coefficients between short experienced managers and long experienced managers in bull markets and in bear markets in the presence of media coverage. We report these results in Appendix B, Table 4.

[Insert Table 11 Here]

We examine another proxy for fund managers' agency issue-motivated risk-shifting incentives. Kempf, Ruenzi and Thiele (2009) and Huang, Sialm and Zhang (2011) document that younger funds might have greater risk-taking incentive compared to older funds. Also, younger funds can be an alternative measure to capture fund convexity of flow-performance sensitivity as Chevalier and Ellison (1997) show that younger fund have a more convex flow-performance relationship compared to older funds. We examine the age of funds in the mutual fund industry as a proxy for risk-shifting incentive. We find younger funds engage more in risk shifting than older funds. We also find the reduction effect of media to be more pronounced among younger funds compared to older funds. These results are presented in Appendix B, Table 5. We also further examine younger and older funds in the context of bull and bear markets. Those results are also reported in Appendix B, Table 6.

7.0 The Business Media and the Level of Fund's Total Risk Exposure

This section examines how the business media affects the level of funds' total risk exposure. In the same spirit as discussed above, the relationship between the business media and risk-shifting behavior, we also believe the relationship between the business media and the level of a fund's total exposure could be attributable to agency conflicts between managers and investors. A risk-averse manager who cares about her personal compensation and cares about the business media scrutiny of her holdings may maintain a stable or lower her risk level, and the opposite is true for the less risk-averse manager who will instead increase the level of risk in an attempt to increase personal gains regardless of the media scrutiny of her holdings. If the average fund manager is risk-averse and cares about the business media of her holdings, we expect a negative relationship

between the business media of her stock holdings and the fund's total risk exposure level in the stock holdings. We examine our fourth hypothesis using the regression as follows:

$$Total\ Risk\ Level_{j,t} = \alpha + \beta News_{j,t-1} + \gamma Controls_{j,t-1} + \varepsilon_{j,t} \quad (5)$$

where $Total\ Risk\ Level_{j,t}$ is the level of total risk exposure of fund *j* in year *t*, which is annualized standard deviation of fund returns. $News_{j,t-1}$ represents the business media variables for fund *j* measured in year *t*. We control for the same set of variables as in our baseline model (Table 2). We control for time fixed effects and also cluster standard errors at the fund level.

We show the results of this analysis in Table 12. We find that all four proxies for the business media are negatively related to the funds' total risk level and are significant at the 1% level. From column (1), we find the News_Count coefficient to be -0.005 with a t-statistic of -3.61, whereas in column (3), News_AEV yields -0.003 with a t-statistic -5.68. We find these coefficients much smaller than those reported in our baseline results. We also acknowledge that return volatility may not best capture a fund manager's intended risk-shifting behavior. Overall, these results on funds' total risk exposure afford us more intuition into the association between the business media and mutual fund risk-shifting.

[Insert Table 12 Here]

8.0 Robustness Tests

In this section, we run a battery of additional tests to support the robustness of our results in the main analysis. Specifically, we construct another holding-based risk-shifting measure and retest our hypotheses.

8.1 Kempf, Ruenzi and Thiele (2009) Risk-Shifting Measure

The measure, *Intra-Year Risk-Shifting*, is constructed following Kempf, Ruenzi and Thiele (2009). This measure is in the same spirit as the one proposed by Huang, Sialm and Zhang (2011). This measure also uses portfolio holdings to capture the intended risk change from the first half of the year to the second half of the year. The measure is constructed as follows:

$$Intra\text{–}Year\ Risk\text{–}Shifting_{j,t} = \sigma_{j,t}^{2,int} - \sigma_{j,t}^{1} \quad (6)$$

where *j* represents fund and *t* denotes year. $\sigma_{j,t}^{2,int}$, the intended portfolio risk variable is calculated in the second half of the year using actual portfolio weights in the second half of the year and the volatility of the stocks in the first half of the year. The intended risk change in the above equation

is calculated as the difference between the intended portfolio risk in the second half of the year, $\sigma_{j,t}^{2,int}$, and the realized portfolio risk in the first half of the year, $\sigma_{j,t}^{1}$, calculated from the actual portfolio weights and volatility of stocks in the first half of the year. Fund volatility for each half of the year is measured as the standard deviation of 26 weekly fund return series. By construction, this measure is not affected by changes in underlying stock volatility. It captures the effect of active portfolio constitution changes in the second half of the year over the first half of the year. This measure is as well annualized by multiplying it by the square root of 52 and presented in yearly percentage points.

8.1.1 Business Media and Intra-Year Risk-Shifting

Here, we reexamine our baseline results from equation (2) using the holding-based *intra-year risk-shifting* measure by Kempf, Ruenzi and Thiele (2009). We present the results using the *intra-year risk-shifting* measure as the dependent variable in Table 13. We find that our business media proxies have negative coefficients and are significant at 1% level, similar to our main results presented in Table 2. The coefficient on News_Count in column (1) is -0.704 having a t-statistic of -8.97, whereas News_AEV in column (2) yields -0.316 with a t-statistic of -12.50. Based on the point estimate in column 1 (2), a 1 standard deviation increase in the business media coverage is associated with a 0.135 (0.147) standard deviation decrease in the *intra-year risk-shifting* measure in terms of economic significance. Basically, a 1 standard deviation increase in News_Count (News_AEV) in column 1 (2) is associated with 0.704*0.784=55.2% (0.316*1.899=60.0%) reduction in *intra-year risk-shifting*. These results still hold and are statistically and economically significant even after controlling for fund objective, fund manager, and fund family fixed effects in columns (3) and (4) of Table 13. These results reinforce those presented in Table 2. We document similar results in Appendix B Table 7, where the *intra-year risk-shifting* measure is constructed as a ratio instead of difference. Appendix B Table 8 also presents similar results where our main independent variables are high business media coverage indicators. Furthermore, Appendix B Table 9 presents results where the dependent variable is the absolute values of *intra-year risk-shifting* measure.

[Insert Table 13 Here]

8.1.2 Agency Issue-Motivated Risk-Shifting Incentives

In this subsection, we reexamine whether the business media's effect varies with the level of agency issue-motivated risk-shifting incentives. We re-estimate the same model used in equation (4), but this time, the dependent variable is the holding-based *intra-year risk-shifting* measure by Kempf, Ruenzi and Thiele (2009). In capturing fund managers' risk-shifting incentives, we use (i) the convex relationship between funds' flow and performance and (ii) the past performance of funds, as used in Tables 7 and 9, respectively.

Using the flow-performance convexity relationship as the proxy for risk-shifting incentive, we present the results in Table 14. Per our expectation, we find that the coefficient estimate of the indicator variable for the flow-performance convexity relationship is positive and statistically significant at the 1% level, except for column (4), which is significant at the 5% level. This stands to reason that a convex relationship between a manager's flow and performance induces such a manager to shift more risk. The evidence also shows that the effect of the business media on risk-shifting for the sub-sample of funds having a convex flow-performance relationship is much higher in magnitude than the size of the impact of business media on the sub-sample without convex flow-performance relationship. We show that there is a significant difference between β_1 and β_2. Using the F-tests shown at the bottom row of the table indicates that these differences are significant at the 1% level. We primarily offer robust evidence that the business media meaningfully reduces risk-shifting among funds with convex flow-performance sensitivity. This result buttresses our main results in Table 7.

[Insert Table 14 Here]

Also, we use the fund's past performance as the proxy for risk-shifting incentive. We present the results in Table 15. We find that the coefficient estimate of the indicator variable for poor performance is positive and statistically significant at the 1% level, except for column (2), which is significant at the 5% level, and column (4), which is not significant. This means that a fund's poor past performance induces the manager to shift more risk. The evidence also shows that the effect of the business media on risk-shifting for the sub-sample of funds having poor past performance is much higher in magnitude than the size of the effect of business media on the sub-sample with better past performance. We show that there is a significant difference between β_1 and β_2. We use the *F*-tests shown at the bottom row of the table to show these differences are significant at the 1% level for only columns (1) and (3). Overall, we provide robust evidence that the business media significantly reduces risk-shifting among funds having poor past performance.

Taken together, both pieces of evidence provided in Table 14 and 15 reaffirms those results provided in Table 7 and 9, respectively, showing that the effect of the business media in reducing risk shifting is specifically stronger among fund managers with greater agency issue-motivated risk-shifting incentives.

[Insert Table 15 Here]

Furthermore, Appendix B Table 10 presents results where the association between media sentiment or tone and risk shifting. Our dependent variable is the *intra-year risk-shifting* measure. This result supports those in Table 6 where the dependent variable is *across-year risk shifting*.

9.0 Conclusion

The existence of extreme risk-shifting behavior by managers in the mutual fund industry has been documented by previous literature. This behavior can be detrimental to fund performance, and therefore imposing large costs on investors. Past literature also demonstrates the crucial role the business media plays in corporate governance. The business media serves as an important incentive alignment mechanism for managers and alleviates managers' agency issue-motived risk-shifting behavior. In other words, the business media can serve as a vital mechanism in reducing agency costs by minimizing information asymmetry between stock holdings management and the fund, which then influences the fund's investment decisions.

Using holding-based risk-shifting measures, which capture fund managers' intended changes in portfolio risk or ex-ante risk choices and not changes in realized risk, we document that the business media coverage of funds' stock holdings reduces mutual fund managers' risk-shifting activities in stock holdings measured by both *across-year risk-shifting* and *intra-year risk-shifting*. This risk reduction effect of the business media is significant and economically substantial. We also examine whether the business media risk-shifting reduction effect is greater among fund managers who have stronger agency issue-motivated risk-shifting incentives. We find this to be true. Fund managers' agency issue-motivated risk-shifting incentives are high when (i) they have a convex flow-performance relationship and (ii) when they have poor performance relative to their peers. We find the reduction effect of the business media to be high when these risk-shifting incentives are high and more pronounced in the bear markets than bull markets. Furthermore, we find that funds with greater business media holdings coverage are associated with lower levels of total risk exposures.

Overall, our paper adds to the literature on the role of the business media as a vital incentive alignment mechanism between managers and investors by lessening managers' agency issue-motived risk-shifting behavior. This evidence is also essential to the vast mutual fund investors, when the fund managers' holdings enjoy a lot of business media coverage, it keeps the managers from engaging in excessive risk-shifting activities.

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Table 1: Summary Statistics

This table presents the summary statistics of all the main variables used in our analysis. The sample comprises 3,676 distinct mutual funds over the period 2000 to 2017. Panel A reports the summary statistics for the risk-shifting measures. The variable *Across-Year Risk Shifting* is a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). *Total Risk Level* is estimated as the annualized standard deviation of fund daily returns. *Intra-Year Risk Shifting* is a holding-based risk-shifting measure constructed following Kempf, Ruenzi and Thiele (2009), defined in Equation (5). Panel B presents the summary statistics for the business media variables. *News_Count* is the natural log of one plus the average number of news articles received by a fund's portfolio holding of stocks in a year. *News_AEV* (Aggregate Event Volume) is the natural log of one plus the average number of events for an entity (excluding neutral ones) using RavenPack's proprietary expert consensus methodology computed over a 91-day rolling window received by a fund's portfolio holding of stocks. *High_News_Count* (*High_News_AEV*) is an indicator variable equal to 1 if a fund's *News_Count* (*News_AEV*) is above the median number and 0 otherwise. Panel C reports the summary statistics for equity mutual fund characteristics. *Fund Size* is the total net asset of fund in millions of dollars aggregated across all share classes. *Fund Age* represents the number of years a fund is present in the CRSP equity mutual fund database. *Flow* is the growth rate of assets under management after adjusting for the appreciation of the fund's assets. *Turnover* is the turnover ratio of a fund. *Expense* represents a fund's expense ratio. *Net Return* is the fund's net return. *Number of Stocks* is the count of the number of stocks each fund holds in its portfolio. *Mgr. Tenure* is the length of time that a manager has been at the helm of a mutual fund. *Team Managed* is an indicator variable that equals 1 if a fund is managed by multiple managers and 0 otherwise. *Cum.12-Month Ret* is the cumulative net of fee return over the 12-month window in a year. *Tracking Error* is the standard deviation of the residuals from regressions of excess fund returns on excess stock market returns over the previous year.

	Panel A: Risk Shifting Measures						
	Mean	Std Dev	5th Pctl	25th Pctl	Median	75th Pctl	95th Pctl
Across-Year Risk Shifting (%)	0.509	3.061	-0.448	-0.007	0.195	0.585	2.741
Total Risk Level (%)	0.140	0.104	0.062	0.093	0.120	0.169	0.274
Intra-Year Risk Shifting (%)	0.387	4.076	-4.031	-0.994	0.326	1.982	5.101
	Panel B: Business Media						
	Mean	Std Dev	5th Pctl	25th Pctl	Median	75th Pctl	95th Pctl
News_Count (log)	5.210	0.784	3.690	4.734	5.308	5.825	6.281
News_AEV (log)	9.498	1.899	6.411	8.156	9.348	11.011	12.559
High_News_Count	0.470	0.499	0.000	0.000	0.000	1.000	1.000
High_News_AEV	0.500	0.500	0.000	0.000	1.000	1.000	1.000
	Panel C: Fund characteristics						
	Mean	Std Dev	5th Pctl	25th Pctl	Median	75th Pctl	95th Pctl
Fund Size ($Millions)	1661.023	8237.300	12.700	68.000	252.700	954.200	6111.100
Fund Age (Years)	22.544	13.505	6.000	14.000	20.000	27.000	49.000
Flow	0.017	0.078	-0.080	-0.018	0.009	0.042	0.134
Turnover	0.855	1.341	0.080	0.280	0.560	1.010	2.310
Expense	0.012	0.005	0.003	0.009	0.011	0.014	0.020
Net Return	0.016	0.036	-0.045	-0.002	0.014	0.034	0.074
Number of Stocks	171.844	323.563	24.000	47.000	76.000	137.000	584.000
Mgr. Tenure	13.057	7.190	4.000	8.000	12.000	17.000	26.000
Team Managed	0.790	0.407	0.000	1.000	1.000	1.000	1.000
Cum.12-Month Ret. (%)	6.674	20.978	-39.076	-1.158	9.992	18.974	34.108
Tracking error (%)	4.334	2.329	1.518	2.746	3.784	5.569	8.406

Table 2: Business Media and Mutual Fund Risk Shifting

This table reports the coefficient estimates from regression estimation of Equation (2) on the relationship between the Business Media and Mutual Fund Risk-Shifting while controlling for fund characteristics. The dependent variable is *Across-Year Risk Shifting*, a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the business media variables: *News_Count* is the natural log of one plus the average number of news articles received by a fund's portfolio holding of stocks in a year. *News_AEV* (Aggregate Event Volume) is the natural log of one plus the average number of events for an entity (excluding neutral ones) using RavenPack's proprietary expert consensus methodology computed over a 91-day rolling window received by a fund's portfolio holding of stocks. All other variables are defined in Appendix A. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting			
	1	2	3	4
News_Count *t-1*	-0.560***		-0.255***	
	(-6.76)		(-3.10)	
News_AEV *t-1*		-0.160***		-0.057**
		(-5.70)		(-2.02)
Fund Size *t-1*	0.075***	0.072***	0.027	0.025
	(6.13)	(5.88)	(1.37)	(1.24)
Fund Age *t-1*	0.044	0.068	-0.178	-0.189
	(1.05)	(1.57)	(-0.86)	(-0.90)
Flow *t-1*	-0.530**	-0.512**	0.080	0.088
	(-2.39)	(-2.30)	(0.46)	(0.50)
Turnover*t-1*	0.001	0.005	0.157***	0.156***
	(0.02)	(0.18)	(4.22)	(4.20)
Expense *t-1*	0.116***	0.136***	-0.073	-0.062
	(2.80)	(3.26)	(-0.57)	(-0.48)
Number of Stocks *t-1*	-0.411***	-0.383***	-0.223***	-0.215***
	(-9.63)	(-9.24)	(-3.85)	(-3.70)
Cum.12-Month Ret. *t-1*	-0.010***	-0.008**	0.002	0.002
	(-3.00)	(-2.56)	(1.22)	(1.54)
Team Managed *t-1*	0.006	-0.003	0.349***	0.354***
	(0.14)	(-0.06)	(2.63)	(2.66)
Mgr. Tenure *t-1*	-0.036	-0.032	0.162	0.175
	(-0.78)	(-0.69)	(0.85)	(0.90)
Tracking error *t-1*	-0.251***	-0.241***	0.028**	0.028**
	(-7.46)	(-7.13)	(2.01)	(1.99)
Constant	5.803***	4.131***	2.389***	1.579**
	(7.77)	(7.19)	(2.97)	(2.14)
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.093	0.087	0.452	0.451
Observations	35,217	35,214	20,657	20,657

Table 3: Bull and Bear Markets

This table presents the coefficient estimates from regressing Mutual Fund Risk-Shifting on Business Media interacted with Bull and Bear markets while controlling for fund characteristics. The dependent variable is *Across-Year Risk Shifting*, a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the interactions (media and markets), *Bull Market* (*Bear Market*) is a dummy variable which is equal to one when the markets are up (down) or compensation incentives (employment risks) are more important, and zero otherwise. *News_Count* is the natural log of one plus the average number of news articles received by a fund's portfolio holding of stocks in a year. *News_AEV* (Aggregate Event Volume) is the natural log of one plus the average number of events for an entity (excluding neutral ones) using RavenPack's proprietary expert consensus methodology computed over a 91-day rolling window received by a fund's portfolio holding of stocks. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Across-Year Risk Shifting				
	1	2	3	4
News_Count$_{t-1}$*Bull Market	-0.551***		-0.252***	
	(-7.94)		(-3.01)	
News_Count$_{t-1}$*Bear Market	-0.565***		-0.261***	
	(-6.02)		(-3.14)	
News_AEV$_{t-1}$*Bull Market		-0.150***		-0.054*
		(-6.29)		(-1.94)
News_AEV$_{t-1}$*Bear Market		-0.166***		-0.064**
		(-5.24)		(-2.10)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.093	0.087	0.452	0.451
Observations	35,217	35,214	20,657	20,657

Table 4: High Media Coverage and Mutual Fund Risk Shifting

This table presents the coefficient estimates from regressions estimating the relationship between High Business Media Coverage and Mutual Fund Risk-Shifting while controlling for fund characteristics. The dependent variable is *Across-Year Risk Shifting*, a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the high business media variables: *High_News_Count* (*High_News_AEV*) is an indicator variable that is equal to 1 if a fund's *News_Count* (*News_AEV*) is above the median number and 0 otherwise. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Across-Year Risk Shifting		
	1	2
High_News_Count $_{t-1}$	-0.375***	
	(-6.64)	
High_News_AEV $_{t-1}$		-0.276***
		(-5.08)
Control Variables $_{t-1}$	YES	YES
Year Fixed Effect	YES	YES
Cluster by Fund	YES	YES
Adj. R^2	0.083	0.081
Observations	35217	35217

Table 5: Business Media and Absolute Risk Shifting

This table presents the coefficient estimates from regressions estimating the relationship between Business Media Coverage and Absolute Mutual Fund Risk-Shifting values while controlling for fund characteristics. The dependent variable is *Absolute Across-Year Risk Shifting* which is the absolute values of the holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the business media variables: *News_Count* is the natural log of one plus the average number of news articles received by a fund's portfolio holding of stocks in a year. *News_AEV* (Aggregate Event Volume) is the natural log of one plus the average number of events for an entity (excluding neutral ones) using RavenPack's proprietary expert consensus methodology computed over a 91-day rolling window received by a fund's portfolio holding of stocks. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Absolute Across-Year Risk Shifting		
	1	2
News_Count $_{t-1}$	-0.196***	
	(-4.90)	
News_AEV$_{t-1}$		-0.120***
		(-3.38)
Control Variables $_{t-1}$	YES	YES
Year Fixed Effect	YES	YES
Cluster by Fund	YES	YES
Adj. R^2	0.078	0.076
Observations	35,221	35,218

Table 6: Media Tone and Risk Shifting

This table reports the regression results estimating the association between Media sentiment or tone and Mutual Fund Risk-Shifting while controlling for fund characteristics. The dependent variable is *Across-Year Risk Shifting*, a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variable of interest is *Sentiment*, a dummy variable that is equal to 1 if a fund's holdings receive more negative news sentiments relative to positive sentiments or 0 otherwise. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Across-Year Risk Shifting		
	1	2
Sentiment $_{t-1}$	-1.807***	-1.584***
	(-3.17)	(-3.08)
Control Variables $_{t-1}$	YES	YES
Year Fixed Effect	YES	YES
Objective Fixed Effect	NO	YES
Manager Fixed Effect	NO	YES
Family Fixed Effect	NO	YES
Cluster by Fund	YES	YES
Adj. R^2	0.112	0.490
Observations	35,108	20,610

Table 7: Convex vs. Non-convex Flow-performance Relationship

This table reports the results from the interaction effects between proxy for agency-motivated risk-shifting incentives and the effect of the business media on risk-shifting. The regressions are stated as in Equation (4). The proxy for the risk-shifting incentive is called *Convex,* an indicator variable that takes the value of 1 if a fund has a convex flow-performance relationship and 0 otherwise. *Across-Year Risk Shifting* is a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the interactions between the business media variables and the dummy variable *Convex*. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined in Appendix A. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting			
	1	2	3	4
News_Count$_{t-1}$*Convex	-0.639***		-0.282***	
	(-6.75)		(-3.33)	
News_Count$_{t-1}$*Non-Convex	-0.427***		-0.201**	
	(-6.42)		(-2.52)	
News_AEV$_{t-1}$*Convex		-0.186***		-0.065**
		(-5.86)		(-2.24)
News_AEV$_{t-1}$*Non-Convex		-0.114***		-0.040
		(-4.95)		(-1.44)
Convex	1.147***	0.725***	0.412***	0.237**
	(4.64)	(4.81)	(3.06)	(2.49)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.095	0.088	0.452	0.451
Observations	35,217	35,214	20,657	20,657
F-tests (p-value)	0.000	0.000	0.002	0.010

Table 8: Bull and Bear Markets: Convex vs. Non-convex Flow-performance Relationship

This table presents the results from the triple interaction effects between proxy for agency-motivated risk-shifting incentives, market types and business media on risk-shifting. *Across-Year Risk Shifting* is the dependent variable, which is a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the triple interactions between the business media variables, convex or non-convex and the market types (bull and bear markets). The proxy for the risk-shifting incentive is called *Convex,* an indicator variable that takes the value of 1 if a fund has a convex flow-performance relationship and 0 otherwise. *Bull Market* (*Bear Market*) is a dummy variable which is equal to one when the markets are up (down) or compensation incentives (employment risks) are more important, and zero otherwise. The p-values for the F-tests are reported, a test showing the difference in coefficients is equal to zero. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined in Appendix A. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting		
	1	2	F-tests (p-value)
News_Count$_{t-1}$*Convex*Bull Market	-0.636***		a
	(-7.82)		
News_Count$_{t-1}$*Non-Convex*Bull Market	-0.422***		b
	(-7.48)		(a-b) (0.000)
News_Count$_{t-1}$*Convex*Bear Market	-0.641***		c
	(-6.10)		
News_Count$_{t-1}$*Non-Convex*Bear Market	-0.432***		d
	(-5.57)		(c-d) (0.000)
News_AEV$_{t-1}$*Convex*Bull Market		-0.177***	e
		(-6.47)	
News_AEV$_{t-1}$*Non-Convex*Bull Market		-0.105***	f
		(-5.28)	(e-f) (0.000)
News_AEV$_{t-1}$*Convex*Bear Market		-0.191***	g
		(-5.44)	
News_AEV$_{t-1}$*Non-Convex*Bear Market		-0.120***	h
		(-4.53)	(g-h) (0.000)
Convex	1.142***	0.721***	
	(4.66)	(4.82)	
Control Variables $_{t-1}$	YES	YES	
Year Fixed Effect	YES	YES	
Cluster by Fund	YES	YES	
Adj. R^2	0.095	0.086	
Observations	35,209	35,206	

Table 9: Poor Performers (Losers) vs. Better Performers (Winners)

This table reports the results from the interaction effects between a proxy for agency-motivated risk-shifting incentives and the effect of the business media on risk-shifting. The regressions are stated as in Equation (4). The proxy for the risk-shifting incentive is called *Loser*, an indicator variable that is equal to 1 if a fund's past performance is in the bottom quartile and 0 otherwise. *Across-Year Risk Shifting* is a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the interactions between the business media variables and the dummy variable *Loser*. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined in Appendix A. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting			
	1	2	3	4
News_Count$_{t-1}$*Loser	-0.796***		-0.440***	
	(-5.09)		(-4.81)	
News_Count$_{t-1}$*Non-Loser	-0.496***		-0.224***	
	(-6.99)		(-2.76)	
News_AEV$_{t-1}$*Loser		-0.197***		-0.084**
		(-3.22)		(-2.13)
News_AEV$_{t-1}$*Non-Loser		-0.109***		-0.023
		(-5.55)		(-0.65)
Loser	1.716***	1.515**	1.143***	0.944***
	(3.03)	(2.00)	(5.38)	(3.64)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.095	0.086	0.454	0.452
Observations	35,217	35,214	20,657	20,657
F-tests (p-value)	0.005	0.071	0.000	0.000

Table 10: Bull and Bear Markets: Poor Performers (Losers) vs. Better Performers (Winners)

This table presents the results from a triple interaction effects between proxy for agency-motivated risk-shifting incentives, market types and business media on risk-shifting. *Across-Year Risk Shifting* is the dependent variable, which is a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the triple interactions between the business media variables, loser or non-loser and the market types (bull and bear markets). The proxy for the risk-shifting incentive is called *Loser*, an indicator variable that is equal to 1 if a fund's past performance is in the bottom quartile and 0 otherwise. *Bull Market* (*Bear Market*) is a dummy variable which is equal to one when the markets are up (down) or compensation incentives (employment risks) are more important, and zero otherwise. The p-values for the F-tests are reported, a test showing the difference in coefficients is equal to zero. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined in Appendix A. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting		
	1	2	F-tests (p-value)
News_Count$_{t-1}$*Loser*Bull Market	-0.791***		a
	(-5.75)		
News_Count$_{t-1}$*Non-Loser*Bull Market	-0.483***		b
	(-7.82)		(a-b) (0.004)
News_Count$_{t-1}$*Loser*Bear Market	-0.790***		c
	(-4.71)		
News_Count$_{t-1}$*Non-Loser*Bear Market	-0.505***		d
	(-6.23)		(c-d) (0.007)
News_AEV$_{t-1}$*Loser*Bull Market		-0.181***	e
		(-3.70)	
News_AEV$_{t-1}$*Non-Loser*Bull Market		-0.091***	f
		(-5.31)	(e-f) (0.067)
News_AEV$_{t-1}$*Loser*Bear Market		-0.200***	g
		(-2.93)	
News_AEV$_{t-1}$*Non-Loser*Bear Market		-0.120***	h
		(-4.73)	(g-h) (0.099)
Loser	1.684***	1.449*	
	(3.00)	(1.92)	
Control Variables $_{t-1}$	YES	YES	
Year Fixed Effect	YES	YES	
Cluster by Fund	YES	YES	
Adj. R^2	0.095	0.086	
Observations	35217	35214	

Table 11: Short Experience vs. Long Experience

This table reports the results from the interaction effects between a proxy for agency-motivated risk-shifting incentives and the effect of the business media on risk-shifting. The regressions are stated as in Equation (4). The proxy for the risk-shifting incentive is called *Short experience*, an indicator variable that is equal to 1 if a fund manager has tenure below the industry median and 0 otherwise. The dependent variable is *Across-Year Risk Shifting*, a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the interactions between the business media variables and the dummy variables *Short or long experience*. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined in Appendix A. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting			
	1	2	3	4
News_Count$_{t-1}$*Short Experience	-0.659***		-0.288***	
	(-6.15)		(-3.35)	
News_Count$_{t-1}$*Long Experience	-0.482***		-0.231***	
	(-6.84)		(-2.79)	
News_AEV$_{t-1}$*Short Experience		-0.186***		-0.063**
		(-5.10)		(-2.12)
News_AEV$_{t-1}$*Long Experience		-0.138***		-0.051*
		(-5.65)		(-1.77)
Short Experience	0.758**	0.280	0.052	-0.132
	(2.31)	(1.25)	(0.21)	(-0.62)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.094	0.088	0.452	0.451
Observations	35,217	35,214	20,657	20,657
F-tests (p-value)	0.003	0.026	0.157	0.496

Table 12: Business Media and the Level of Funds' Total Risk Exposure

This table reports the coefficient estimates from regressions estimation of Equation (5) on the relationship between the Business Media and Funds' Total Risk Level while controlling for fund characteristics. The dependent variable, *Total Risk Level*, is estimated as the annualized standard deviation of fund daily returns. Our main independent variables of interest are the business media variables as defined in Appendix A. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined as in Appendix A. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Total Risk Level			
	1	2	3	4
News_Count$_{t-1}$	-0.005***			
	(-3.61)			
High_News_Count$_{t-1}$		-0.005***		
		(-5.33)		
News_AEV$_{t-1}$			-0.003***	
			(-5.68)	
High_News_AEV$_{t-1}$				-0.010***
				(-6.23)
Fund Size$_{t-1}$	-0.001**	-0.001***	-0.001**	-0.001***
	(-2.51)	(-2.90)	(-2.40)	(-2.66)
Fund Age$_{t-1}$	-0.002	-0.001	-0.001	-0.001
	(-0.77)	(-0.41)	(-0.63)	(-0.35)
Flow$_{t-1}$	-0.010*	-0.010*	-0.010*	-0.010*
	(-1.82)	(-1.84)	(-1.88)	(-1.88)
Turnover$_{t-1}$	0.001***	0.001***	0.001***	0.001***
	(2.64)	(3.63)	(2.72)	(3.56)
Expense$_{t-1}$	-0.001	-0.000	-0.001	-0.001
	(-1.29)	(-0.53)	(-1.48)	(-1.05)
Number of Stocks$_{t-1}$	0.001**	0.004***	0.001**	0.003***
	(2.49)	(7.53)	(2.07)	(6.66)
Cum.12-Month Ret.$_{t-1}$	-0.000*	-0.000	-0.000**	-0.000
	(-1.95)	(-0.60)	(-2.23)	(-1.35)
Team Managed$_{t-1}$	-0.001	-0.001	-0.001*	-0.001
	(-1.49)	(-1.32)	(-1.69)	(-1.61)
Mgr. Tenure$_{t-1}$	-0.002**	-0.002**	-0.002**	-0.002**
	(-2.04)	(-2.12)	(-2.22)	(-2.35)
Tracking error$_{t-1}$	0.015***	0.015***	0.015***	0.015***
	(44.11)	(51.16)	(43.30)	(47.86)
Constant	0.103***	0.065***	0.104***	0.073***
	(7.28)	(11.97)	(9.39)	(11.51)
Year Fixed Effect	YES	YES	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.347	0.346	0.347	0.348
Observations	35,221	35,221	35,218	35,218

Table 13: Business Media and Intra-Year Risk-Shifting

This table reports the coefficient estimates from regressions estimating the relationship between the Business Media and Mutual Fund Risk-Shifting while controlling for fund characteristics. The dependent variable is *Intra-Year Risk Shifting* which is a holding-based risk-shifting measure constructed following Kempf, Ruenzi and Thiele (2009), defined in Equation (6). Our main independent variables of interest are the business media variables: *News_Count* is the natural log of one plus the average number of news articles received by a fund's portfolio holding of stocks in a year. *News_AEV* (Aggregate Event Volume) is the natural log of one plus the average number of events for an entity (excluding neutral ones) using RavenPack's proprietary expert consensus methodology computed over a 91-day rolling window received by a fund's portfolio holding of stocks. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined in Appendix A. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Intra-Year Risk Shifting			
	1	2	3	4
News_Count$_{t-1}$	-0.704***		-0.899***	
	(-8.97)		(-6.33)	
News_AEV$_{t-1}$		-0.316***		-0.547***
		(-12.50)		(-12.78)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.27	0.273	0.373	0.375
Observations	35,221	35,218	20,657	20,657

Table 14: Intra-Year Risk-Shifting: Convex vs. Non-convex Flow-performance Relationship

This table reports the results from the interaction effects between a proxy for agency-motivated risk-shifting incentives and the effect of the business media on risk-shifting. The regressions are stated as in Equation (4). The proxy for the risk-shifting incentive is called *Convex,* an indicator variable that takes the value of 1 if a fund has a convex flow-performance relationship and 0 otherwise. *Intra-Year Risk Shifting* is a holding-based risk-shifting measure constructed following Kempf, Ruenzi and Thiele (2009), defined in Equation (6). Our main independent variables of interest are the interactions between the business media variables and the dummy variable *Convex*. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined in Appendix A. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Intra-Year Risk Shifting			
	1	2	3	4
News_Count$_{t-1}$*Convex	-0.710***		-0.905***	
	(-9.06)		(-6.37)	
News_Count$_{t-1}$*Non-Convex	-0.690***		-0.882***	
	(-8.72)		(-6.19)	
News_AEV$_{t-1}$*Convex		-0.318***		-0.547***
		(-12.66)		(-12.76)
News_AEV$_{t-1}$*Non-Convex		-0.308***		-0.536***
		(-12.00)		(-12.40)
Convex	0.150***	0.143***	0.126***	0.117**
	(4.06)	(3.86)	(2.68)	(2.48)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.27	0.273	0.373	0.375
Observations	35,221	35,218	20,657	20,657
F-tests (p-value)	0.002	0.003	0.010	0.016

Table 15: Poor Performers (Losers) vs. Better Performers (Winners)

This table reports the results from the interaction effects between a proxy for agency-motivated risk-shifting incentives and the effect of the business media on risk-shifting. The regressions are stated as in Equation (4). The proxy for the risk-shifting incentive is called *Loser*, an indicator variable that is equal to 1 if a fund's past performance is in the bottom quartile and 0 otherwise. *Intra-Year Risk Shifting* is a holding-based risk-shifting measure constructed following Kempf, Ruenzi and Thiele (2009), defined in Equation (6). Our main independent variables of interest are the interactions between the business media variables and the dummy variable *Loser*. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. All other variables are defined in Appendix A. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Intra-Year Risk Shifting			
	1	2	3	4
News_Count$_{t-1}$*Loser	-0.775***		-0.983***	
	(-11.26)		(-6.84)	
News_Count$_{t-1}$*Non-Loser	-0.403**		-0.423**	
	(-2.53)		(-2.52)	
News_AEV$_{t-1}$*Loser		-0.283***		-0.452***
		(-10.22)		(-9.18)
News_AEV$_{t-1}$*Non-Loser		-0.281***		-0.452***
		(-9.59)		(-9.22)
Loser	1.962***	0.119**	2.998***	0.086
	(2.84)	(2.45)	(4.90)	(1.51)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.271	0.272	0.374	0.374
Observations	35,221	35,218	20,657	20,657
F-tests (p-value)	0.004	0.527	0.000	0.900

APPENDIX A

Variable Definition

Variable	Description	Source
Across-Year Risk-Shifting	This is a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined as the difference between the recent portfolio holdings volatility based on a fund's most currently disclosed holdings and the past realized portfolio volatility based on its formerly disclosed holdings.	CRSP
Intra-Year Risk Shifting	This is a holding-based risk-shifting measure constructed following Kempf, Ruenzi and Thiele (2009), this uses portfolio holdings to capture the intended risk change from the first half of the year to the second half of the year.	CRSP
Total Risk Level	This is estimated as the annualized standard deviation of mutual fund daily returns.	CRSP
Absolute Across-Year Risk Shifting	This is the absolute values of the holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011)	CRSP
News_Count	The natural log of the average number of news articles received by a fund's portfolio holding of stocks in a year.	RavenPack
News_AEV	(Aggregate Event Volume) is the natural log of the average number of events for an entity (excluding neutral ones) using RavenPack's proprietary expert consensus methodology computed over a 91-day rolling window received by a fund's portfolio holdings of stocks.	RavenPack
High_News_Count	This is an indicator variable that is equal to 1 if a fund's News_Count is above the median number and 0 otherwise	RavenPack
High_News_AEV	This is an indicator variable that is equal to 1 if a fund's News_AEV is above the median number and 0 otherwise	RavenPack
Sentiment	A dummy variable that is equal to 1 if a fund's holdings receive more negative news sentiments relative to positive sentiments or 0 otherwise.	RavenPack

Convex	This is an indicator variable proxying for risk-shifting incentive, which takes the value of 1 if a fund has a convex flow-performance relationship and 0 otherwise	CRSP
Loser	This is an indicator variable proxying for risk-shifting incentive, which is equal to 1 if a fund's past performance is in the bottom quartile and 0 otherwise	CRSP
Short experience	This is an indicator variable proxying for risk-shifting incentive, which is equal to 1 if a fund manager has tenure below the industry median and 0 otherwise	CRSP
Fund Size	This is the total net asset of fund in millions of dollars aggregated across all share classes	
Fund Age	This is the natural log of one plus the fund age in years, which represents the number of years a fund is present in the CRSP equity mutual fund database	CRSP
Flow	This is the growth rate of assets under management after adjusting for the appreciation of the fund's assets (Sirri and Tufano (1998))	CRSP
Expense	Represents a fund's expense ratio.	CRSP
Turnover	Is the turnover ratio of a fund.	CRSP
Number of Stocks	This is the count of the number of stocks each fund holds in its portfolio	CRSP
Cum.12-Month Ret	This is the cumulative net of fee return over the 12-month window in a year	CRSP
Team Managed	Represents an indicator variable that equals 1 if a fund is managed by multiple managers and 0 otherwise	CRSP
Mgr. Tenure	Denotes the length of time that a manager has been at the helm of affairs for a mutual fund	CRSP
Tracking Error (TE)	This is the standard deviation of the residuals from regressions of excess fund returns on excess stock market returns over the previous year.	CRSP
Net Return	This represents the fund's net return	CRSP

Bull Market	This is a dummy variable which is equal to one when the markets are up (midyear market return is positive) or compensation incentives are more important, and zero otherwise.	CRSP
Bear Market	This is a dummy variable which is equal to one when the markets are down (midyear market return is negative) or employment incentives are more important, and zero otherwise.	CRSP
Younger Funds	An indicator variable that is equal to 1 if a fund age is below the industry median age and 0 otherwise.	CRSP

APPENDIX B

Table 1: Alternative Measure of Mutual Fund Risk Shifting – Ratio

This table presents the results of the robustness test on alternative measure for *Across-Year Risk Shifting*. We repeat our analysis in Table 2 using this alternative measure, *Across-Year Risk Shifting* ***Ratio***, which is computed as a ratio rather than a difference used in Equation (1). This alternative measure is constructed as follows:

$$Across\text{–}Year\ Risk\text{–}Shifting\ \boldsymbol{Ratio}_{j,t} = {\sigma_{j,t}^{H}}\Big/{\sigma_{j,t}^{R}}$$

Where the variables in the above equation are the same as those used in Equation (1). Our main independent variables of interest are the business media variables: *News_Count* and *News_AEV* (Aggregate Event Volume). We include all control variables from Table 2. For the sake of brevity, we only represent the coefficient estimates of our main variables of interest. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting Ratio			
	1	2	3	4
News_Count$_{t-1}$	-0.095***		-0.038**	
	(-4.59)		(-2.26)	
News_AEV$_{t-1}$		-0.027***		-0.011*
		(-3.63)		(-1.78)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.075	0.071	0.767	0.767
Observations	35,217	35,214	20,657	20,657

Table 2: Alternative Measure of Mutual Fund Risk Shifting - Monthly Data

This table presents the results of the robustness test on alternative measure for *Across-Year Risk Shifting*. We repeat our analysis in Table 2 using this alternative measure, *36-Month Across-Year Risk Shifting*, which computes the across-year risk-shifting measure using 36 monthly returns instead of the weekly returns used in our main analysis. Our main independent variables of interest are the business media variables: *News_Count* and *News_AEV* (Aggregate Event Volume). We include all control variables from Table 2. For the sake of brevity, we only represent the coefficient estimates of our main variables of interest. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	36-Month Across-Year Risk Shifting			
	1	2	3	4
News_Count$_{t-1}$	-0.116***		-0.045***	
	(-5.27)		(-3.10)	
News_AEV$_{t-1}$		-0.032***		-0.012**
		(-4.36)		(-2.32)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.122	0.114	0.863	0.863
Observations	28,693	28,692	17,351	17,351

Table 3: Year-by-Year Estimation

This table tabulates the results of year-by-year estimation of equation (2). We use the same specification as those in Table 2 except that we do not control for year fixed effects in the regressions. For brevity, we report only the coefficients on our variable of interest – media coverage. Standard errors are clustered at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting					
	2001	2002	2003	2004	2005	2006
	Regressions using News_Count$_{t-1}$					
News_Count$_{t-1}$	-1.311*	-0.439***	-0.115	-0.513***	-1.130***	-0.877***
	(-1.76)	(-4.15)	(-1.60)	(-7.25)	(-9.85)	(-7.47)
	Regressions using News_AEV$_{t-1}$					
News_AEV$_{t-1}$	-0.558	-0.181***	-0.013	-0.221***	-0.422***	-0.306***
	(-1.64)	(-3.74)	(-0.38)	(-6.31)	(-9.03)	(-7.91)
	2007	2008	2009	2010	2011	2012
	Regressions using News_Count$_{t-1}$					
News_Count$_{t-1}$	-0.378***	-0.694***	-0.600***	-0.741***	-0.377***	-0.950***
	(-5.03)	(-5.97)	(-3.63)	(-4.42)	(-4.30)	(-7.17)
	Regressions using News_AEV$_{t-1}$					
News_AEV$_{t-1}$	-0.133***	-0.231***	-0.181***	-0.236***	-0.111***	-0.270***
	(-4.59)	(-6.54)	(-3.02)	(-4.72)	(-4.38)	(-8.27)
	2013	2014	2015	2016	2017	
	Regressions using News_Count$_{t-1}$					
News_Count$_{t-1}$	-0.401***	-1.089***	-0.984***	-0.638***	-0.909***	
	(-5.25)	(-8.59)	(-6.56)	(-5.26)	(-5.36)	
	Regressions using News_AEV$_{t-1}$					
News_AEV$_{t-1}$	-0.054***	-0.262***	-0.203***	-0.102***	-0.216***	
	(-3.35)	(-8.81)	(-5.01)	(-3.65)	(-4.52)	

Table 4: Bull and Bear Markets: Short Experience vs. Long Experience

This table presents the regression results from a triple interaction effects between proxy for agency-motivated risk-shifting incentives, market types and business media on risk-shifting. *Across-Year Risk Shifting* is the dependent variable, which is a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the triple interactions between the business media variables, short or long experience and the market types (bull and bear markets). The proxy for the risk-shifting incentive is called *Short Experience*, an indicator variable that is equal to 1 if a fund manager has tenure below the industry median and 0 otherwise. *Bull Market* (*Bear Market*) is a dummy variable which is equal to one when the markets are up (down) or compensation incentives (employment risks) are more important, and zero otherwise. The p-values for the F-tests are reported, a test showing the difference in coefficients is equal to zero. All other variables are defined in Appendix A. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Across-Year Risk Shifting			
	1	2	F-tests (p-value)
News_Count$_{t-1}$*Short Experience*Bull Market	-0.646***		a
	(-7.06)		
News_Count$_{t-1}$*Long Experience*Bull Market	-0.471***		b
	(-7.89)		(a-b) (0.003)
News_Count$_{t-1}$*Short Experience*Bear Market	-0.667***		c
	(-5.62)		
News_Count$_{t-1}$*Long Experience*Bear Market	-0.487***		d
	(-6.01)		(c-d) (0.002)
News_AEV$_{t-1}$*Short Experience*Bull Market		-0.176***	e
		(-5.55)	
News_AEV$_{t-1}$*Long Experience*Bull Market		-0.129***	f
		(-6.12)	(e-f) (0.028)
News_AEV$_{t-1}$*Short Experience*Bear Market		-0.193***	g
		(-4.81)	
News_AEV$_{t-1}$*Long Experience*Bear Market		-0.143***	h
		(-5.14)	(g-h) (0.063)
Short Experience	0.765**	0.290	
	(2.33)	(1.29)	
Control Variables $_{t-1}$	YES	YES	
Year Fixed Effect	YES	YES	
Cluster by Fund	YES	YES	
Adj. R^2	0.095	0.089	
Observations	35,217	35,214	

Table 5: Younger and Older Funds

This table reports the results from the interaction effects between a proxy for agency-motivated risk-shifting incentives and the effect of the business media on risk-shifting. The proxy for the risk-shifting incentive is called *Younger Funds*, an indicator variable that is equal to 1 if a fund age is below the industry median age and 0 otherwise. The dependent variable is *Across-Year Risk Shifting*, a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the interactions between the business media variables and the dummy variables *Younger or Older Funds*. All other variables are defined in Appendix A. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Across-Year Risk Shifting			
	1	2	3	4
News_Count$_{t-1}$*Younger Funds	-0.619***		-0.442***	
	(-7.17)		(-3.71)	
News_Count$_{t-1}$*Older Funds	-0.548***		-0.252***	
	(-6.36)		(-3.02)	
News_AEV$_{t-1}$*Younger Funds		-0.166***		-0.192***
		(-5.30)		(-2.84)
News_AEV$_{t-1}$*Older Funds		-0.158***		-0.053*
		(-5.43)		(-1.86)
Younger Funds	0.382	0.059	1.253**	1.485**
	(1.11)	(0.23)	(2.15)	(2.20)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.093	0.087	0.452	0.452
Observations	35,217	35,214	20,657	20,657
F-tests (p-value)	0.250	0.746	0.052	0.031

Table 6: Bull and Bear Markets: Younger and Older Funds

This table presents the results from the triple interaction effects between proxy for agency-motivated risk-shifting incentives, market types and business media on risk-shifting. *Across-Year Risk Shifting* is the dependent variable, which is a holding-based risk-shifting measure constructed following Huang, Sialm and Zhang (2011), defined in Equation (1). Our main independent variables of interest are the triple interactions between the business media variables, younger or older funds and the market types (bull and bear markets). The proxy for the risk-shifting incentive is called *Younger funds,* an indicator variable that is equal to 1 if a fund age is below the industry median age and 0 otherwise. *Bull Market* (*Bear Market*) is a dummy variable which is equal to one when the markets are up (down) or compensation incentives (employment risks) are more important, and zero otherwise. The p-values for the F-tests are reported, a test showing the difference in coefficients is equal to zero. All other variables are defined in Appendix A. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Across-Year Risk Shifting			
	1	2	F-tests (p-value)
News_Count$_{t-1}$*Younger Funds*Bull Market	-0.610***		a
	(-7.46)		
News_Count$_{t-1}$*Older Funds*Bull Market	-0.539***		b
	(-7.54)		(a-b) (0.258)
News_Count$_{t-1}$*Younger Funds*Bear Market	-0.626***		c
	(-6.73)		
News_Count$_{t-1}$*Older Funds*Bear Market	-0.553***		d
	(-5.68)		(c-d) (0.228)
News_AEV$_{t-1}$*Younger Funds*Bull Market		-0.157***	e
		(-5.13)	
News_AEV$_{t-1}$*Older Funds*Bull Market		-0.149***	f
		(-6.06)	(e-f) (0.738)
News_AEV$_{t-1}$*Younger Funds*Bear Market		-0.172***	g
		(-5.22)	
News_AEV$_{t-1}$*Older Funds*Bear Market		-0.164***	h
		(-5.01)	(g-h) (0.744)
Younger Funds	0.386	0.059	
	(1.14)	(0.24)	
Control Variables $_{t-1}$	YES	YES	
Year Fixed Effect	YES	YES	
Cluster by Fund	YES	YES	
Adj. R^2	0.093	0.087	
Observations	35,217	35,214	

Table 7: Alternative Measure of Intra-Year Risk Shifting - Ratio

This table presents the results of the additional test on alternative measure for *Intra-Year Risk Shifting*. We repeat our analysis in Table 8 using this alternative measure, *Intra-Year Risk Shifting* ***Ratio****,* which is computed as a ratio, rather than a difference as used in Equation (5). This alternative measure is constructed as follows:

$$Intra\text{–}Year\ Risk\text{–}Shifting\ \boldsymbol{Ratio}_{j,t} = {\sigma_{j,t}^{2,int}}\Big/{\sigma_{j,t}^{1}}$$

Where the variables in the above equation are the same as those used in Equation (5). Our main independent variables of interest are the business media variables: *News_Count* and *News_AEV* (Aggregate Event Volume). We include all control variables from Table 8. For the sake of brevity, we only represent the coefficient estimates of our main variables of interest. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Intra-Year Risk Shifting Ratio			
	1	2	3	4
News_Count$_{t-1}$	-0.095***		-0.099***	
	(-16.03)		(-7.91)	
News_AEV$_{t-1}$		-0.043***		-0.064***
		(-22.24)		(-15.49)
Control Variables $_{t-1}$	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Objective Fixed Effect	NO	NO	YES	YES
Manager Fixed Effect	NO	NO	YES	YES
Family Fixed Effect	NO	NO	YES	YES
Cluster by Fund	YES	YES	YES	YES
Adj. R^2	0.329	0.335	0.390	0.395
Observations	35,221	35,218	20,657	20,657

Table 8: High Media Coverage and Intra-Year Risk Shifting

This table presents the regression results estimating the relationship between High Business Media Coverage and Mutual Fund Risk-Shifting while controlling for fund characteristics. The dependent variable is *Intra-Year Risk Shifting* which is a holding-based risk-shifting measure constructed following Kempf, Ruenzi and Thiele (2009), defined in Equation (5). Our main independent variables of interest are the high business media variables: *High_News_Count* (*High_News_AEV*) is an indicator variable that is equal to 1 if a fund's *News_Count* (*News_AEV*) is above the median number and 0 otherwise. We include all control variables from Table 8. For the sake of brevity, we only represent the coefficient estimates of our main variables of interest. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Intra-Year Risk Shifting		
	1	2
High_News_Count$_{t-1}$	-0.915***	
	(-18.79)	
High_News_AEV$_{t-1}$		-1.020***
		(-19.36)
Control Variables $_{t-1}$	YES	YES
Year Fixed Effect	YES	YES
Cluster by Fund	YES	YES
Adj. R^2	0.271	0.273
Observations	35,221	35,218

Table 9: Business Media and Absolute Intra-Year Risk Shifting

This table presents the regression results estimating the relationship between High Business Media Coverage and Mutual Fund Risk-Shifting while controlling for fund characteristics. The dependent variable is *Absolute Intra-Year Risk Shifting*, which is the absolute values of the holding-based risk-shifting measure constructed following Kempf, Ruenzi and Thiele (2009), defined in Equation (5). Our main independent variables of interest are the high business media variables: *High_News_Count* (*High_News_AEV*) is an indicator variable that is equal to 1 if a fund's *News_Count* (*News_AEV*) is above the median number and 0 otherwise. We include all control variables from Table 8. For the sake of brevity, we only represent the coefficient estimates of our main variables of interest. We also control for year fixed effects and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Absolute Intra-Year Risk Shifting		
	1	2
News_Count$_{t-1}$	-0.329***	
	(-6.67)	
News_AEV$_{t-1}$		-0.304***
		(-7.53)
Control Variables $_{t-1}$	YES	YES
Year Fixed Effect	YES	YES
Cluster by Fund	YES	YES
Adj. R^2	0.264	0.265
Observations	35,221	35,218

Table 10: Media Tone and Intra-Year Risk Shifting

This table reports the regression results estimating the association between Media sentiment or tone and Mutual Fund Risk-Shifting while controlling for fund characteristics. The dependent variable is *Intra-Year Risk Shifting*, a holding-based risk-shifting. Our main independent variable of interest is *Sentiment*, a dummy variable that is equal to 1 if a fund's holdings receive more negative news sentiments relative to positive sentiments or 0 otherwise. For brevity sake, we only report the coefficient estimates of the main variables of interest, even though all control variables from Table 2 are included. We also control for year fixed effects, portfolio manager fixed effect, fund investment style fixed effect, fund family fixed effect, and cluster the standard errors at the fund level. *t*-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Intra-Year Risk Shifting		
	1	2
Sentiment $_{t-1}$	-3.596***	-2.379**
	(-3.40)	(-2.55)
Control Variables $_{t-1}$	YES	YES
Year Fixed Effect	YES	YES
Objective Fixed Effect	NO	YES
Manager Fixed Effect	NO	YES
Family Fixed Effect	NO	YES
Cluster by Fund	YES	YES
Adj. R^2	0.112	0.490
Observations	35,108	20,610