M RNINGSTAR[®]

Fund Managers Switching Firms — Should You Tag Along?

Historical evidence shows that it's tempting, but investors should think twice before taking the leap.

Morningstar Manager Research May 2023

Contents

- 2 Introduction
- 3 Data and Methodology
- 5 Results
- 13 Conclusion

Mathieu Caquineau, CFA Director, Equity mathieu.caquineau@morningstar.com

Matias Möttölä, CFA Director, Multi-Asset and Alternatives matias.mottola@morningstar.com

Maximilian Loth Quantitative Research Intern maximilian.loth@morningstar.com

Tamera Carter Associate Quantitative Analyst Tamera.carter@morningstar.com

Important Disclosure

The conduct of Morningstar's analysts is governed by Code of Ethics/Code of Conduct Policy, Personal Security Trading Policy (or an equivalent of), and Investment Research Policy. For information regarding conflicts of interest, please visit:

https://shareholders.morningstar.com

Key Takeaways

- This paper looks at historical evidence in European and U.S.-domiciled funds in the last 30 years to see whether fund managers who left their firm for a competitor were able to replicate their investment success as measured by gross alpha.
- Fund managers are often poached by a competitor or launch their own firm after having built an attractive track record, making it tempting for investors to follow them.
- ▶ We find that fund managers show short-term success in the initial years of their transfer. It is likely that they are still surfing on the successful investment style that led them to be hired in the first place. They are also benefiting from managing less money in the first years at their new house, making it easier to outperform.
- But investors should be doubtful that past success can be easily replicated in the long term. We find that portfolio managers tend to produce less alpha at their new firm when looking at longer periods, compared with what they achieved at their former employer. Still, investors seem to get a better outcome than sticking with the old fund. On average, the alpha at the old fund after the departure is lower compared with how managers performed at their new house.
- As alpha generation is a mix of luck (plentiful) and skills (scarce), it's not surprising that we don't find a ► strong relationship between alpha generated at the first firm and at the subsequent employer. The data shows a great variability around the mean: Managers with a great track record at their initial employer may end up destroying value at the new firm and, conversely, fund managers with poor track records initially may improve considerably under a new banner.
- There are a few managers who successfully transitioned to their new firm and continued to generate ► excess returns for investors, but relying purely on initial track record to identify the best ones to follow looks like a loser's game. Other considerations can improve investors' chances of success, such as alignment of interests at the new firm, cultural and investment philosophy fit, level of resources, team dynamics, and fees.

Introduction

The asset-management industry often sees fund managers leaving their firm to join a competitor or go their own way to set up their own investment firm. Bond star manager William (Bill) Gross left Pimco in 2014 to join Janus Capital Group. Another famous bond investor, Jeffrey Gundlach, left TCW in 2009 and launched his own firm, DoubleLine Capital. Legendary international stock manager Rajiv Jain departed Vontobel Asset Management in 2016 to create GQG Partners. In Europe, high-profile manager moves include Fidelity losing its star manager Firmino Morgado in 2015 when he went to co-launch a small investment shop before landing at Man GLG in 2017; or European equity manager Matthias Born who left Allianz Global Investors in 2017 to join Berenberg, a small private bank.

These and numerous other manager changes across company lines leave investors wondering whether to follow their manager to the new company or to stay put at the old fund? It takes time to evaluate the situation and several aspects must be considered. How important was that one manager to the success of the fund? Who will take over and what experience and evidence of skills does the new manager(s) bring to the table? How will the fund be managed going forward, and will it be consistent with the previous investing style? If investors conclude that the fund is no longer appropriate for them or has lost its appeal, then why not follow the departing manager to their new home? It is particularly tempting to follow star managers to their new firm or to their own investment boutique.

How likely are these fund managers to repeat their past success? This paper looks at historical evidence in European and U.S.-domiciled funds in the last 30 years to see to what extent fund managers were able to transfer their investment skills and "alpha" potential from their old firm to their new firm. Our goal with the study is to provide more context that will help investors in making better decisions when they are confronted with their funds' portfolio manager moving to a new firm.

Data and Methodology

Type of Funds Included

The study includes surviving and liquidated open-end equity and fixed-income funds domiciled in the United States and in Europe¹ and registered in the Morningstar database. Only actively managed funds were included, as index funds are not meaningfully impacted by a manager change. To allow standardized calculations of excess return and alpha, only funds in Morningstar Categories with a category index assigned to them have been included.

Identification of Fund Managers Moving to a New Firm

We used Morningstar's database of portfolio manager names, which contains start and end dates of all vehicles associated with each manager. An algorithm was used to identify the departures of managers who moved from one firm to another by looking at the historical tenures in the database and cross-checking with asset manager names. Changes were confirmed by using publicly available information such as fund companies' websites and business social media accounts.

Our study only looked at the track record of one manager moving from one firm to another as displayed in Exhibit 1: We tracked manager X running Fund B at firm B and then the same manager running a different fund (Fund A) at a different firm (firm A). We also took a look at what happened to fund B once manager X left (track record 1) but didn't account for any manager changes thereafter.

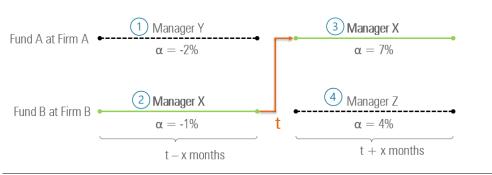


Exhibit 1 Schematic of Included Funds

Source: Morningstar Research.

Funds managed by more than two managers (three managers and more) were excluded. Teammanaged portfolios dilute individual contributions, which we needed to isolate for the purpose of the study. Manager departures are also less problematic for a fund managed by a large team. The performance results more from a collective effort, and it's difficult to split individual contributions. Further, we only included funds housed by firms that are covered by the Morningstar Manager Research team under the Morningstar Analyst Rating.² Our research team covers the largest players in the industry, which allowed us to include a large part of the market from an assets-under-management perspective. Our knowledge of these firms and how they operate also facilitated the qualitative checks

¹ Funds domiciled in Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK, Liechtenstein, and Luxembourg.

² Morningstar Manager Research provides independent, fundamental analysis on managed investment strategies. Analyst views are expressed in the form of Morningstar Analyst Ratings, which are derived through research of three key pillars: the strategy's management team, the parent firm, and the underlying investment process itself.

we performed on individual cases. Finally, we found better disclosure practices from these firms in Europe.

Time Periods and Tenure Requirements

We have included fund managers with track records on funds going back to 1990 in the United States and 2002 in Europe through the end of June 2022. The availability and reliability of manager names in our database was poor in Europe before 2000 but has vastly improved since then. However, it is still generally inferior compared with the United States, where portfolio manager names must be disclosed in mutual fund prospectuses.

All manager tenures shorter than 36 months either at the old or at the new firm were removed to retain only mid- to long-term measurements. In other words, to be included in the three-year alpha cohort, a fund manager needed at least a three-year record at the old firm and three years at the new firm. The same principle applied for the five-year alpha cohort.

Performance Calculations

For each manager, we chose one fund with the longest track record at each firm. For our performance calculations, we used monthly gross returns to remove the effect of fees and isolate the potential value added of the fund manager. The calculation of gross return adjusts the monthly total return for the share class by the share class level fees prevailing at that time. For periods where Morningstar does not have the prevailing fees for the share class, no gross returns are calculated, which can limit the data available for analysis.

We then calculated Jensen's alpha using the capital asset pricing model with the fund's Morningstar Category index. This benchmark is assigned to all funds within a Morningstar category and accounts for style and market-cap exposure and allows funds to be compared in a similar way. For example, the index of the U.S. large-value Morningstar Category is the Russell 1000 Value. The calculations were made in the currency of the category and with the associated risk-free rate. Alpha was calculated by taking the excess average gross monthly return of the fund over the risk-free rate and subtracting beta times the excess average monthly return of the Morningstar Category index:

$$\alpha_M = \overline{R}^e - \beta \overline{B}^e$$

Where,

 $\begin{array}{l} \pmb{\alpha}_{\pmb{M}} &= \text{Monthly measure of gross alpha} \\ \hline \pmb{R}^{\pmb{e}} &= \text{Average monthly excess gross return of the fund} \\ \hline \pmb{B}^{\pmb{e}} &= \text{Average monthly excess return of the benchmark} \\ \hline \pmb{\beta} &= \text{Beta} \end{array}$

The resulting alpha is in monthly terms and was annualized by multiplying by 12.

We calculated three- and five-year annualized alpha both at the old firm and the new firm. The alpha at the old firm was calculated in the three and five years up to the last month-end before departure. The alpha at the new firm was calculated in the three and five years, starting from the first full month after arrival.

Results

When Did the Departures Happen?

Overall, our study identified 518 fund managers who changed shops at least once and had an overall fund manager experience of at least six years (three years minimum at both their old and new firm). When extending to 10-year tenures (five years minimum at both their old and new firm), the number of cases identified dropped to 195. These numbers can look surprisingly low at first sight. After all, portfolio managers moving to a new firm happen constantly in the asset-management industry. But the combination of the criteria related to not allowing funds with more than two managers, expecting the firm to be covered by Morningstar analysts, and the lengths of tenure reduced the number of changes available for our research.

As shown in Exhibit 2, two thirds of the 518 departures identified happened after 2007. It doesn't mean turnover accelerated in the industry from that point forward. This is predominantly the result of the addition of the Europe-domiciled funds to our sample only from 2002; while in the U.S., manager changes stayed close to earlier levels. That said, the spike in the number of managers switching firms in 2008-09 is interesting. Part of it was probably forced turnover in the midst of the global financial crisis. More recently in 2019, the number of departures dropped significantly compared with prior years, which is likely an outcome of the pandemic. Within our sample (which already filters for managers with at least a three-year record prior to the departure), the average manager had been in place for 6.8 years before leaving.

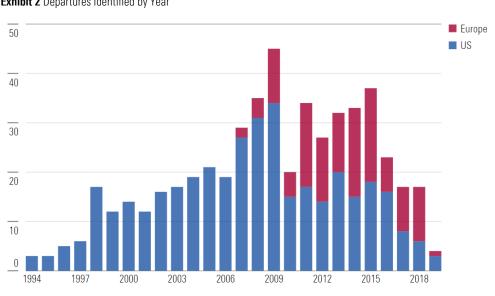


Exhibit 2 Departures Identified by Year

Source: Morningstar Research. Data as of 06/30/2022.

Performance of Fund Managers Prior to Departure

Our research shows that most fund managers who left their firm (voluntarily or involuntarily) had an enticing track record to "sell themselves" elsewhere. On average, fund managers changing shops had produced a positive gross alpha before fees at their old firm when looking at the trailing three- and five-year periods up to their departure (Exhibit 3). In the 195 five-year records included in the study, the average annualized alpha amounted to 1.3%, and 64% of the fund managers delivered positive alpha. Extending to the full tenure of the individual before their departure (6.8 years, on average), the results are even more enticing, with an average annualized alpha of 1.53%, and 68% of the managers with positive gross alpha.

This compares favorably with long-term gross-of-fees alpha generated by U.S. mutual funds. We found that in the past 20 years, the average rolling five-year gross alpha was 0.85%.³ This suggests that portfolio managers who left had superior results. Our study also hints that fund managers are able to generate a significant positive alpha. But investors should take note that looking at returns before fees paints a rosy picture, as fees erode a large part of excess returns. Our experience and academic research show that it is difficult to find portfolio managers who can consistently produce alpha after fees over the long term.⁴

Stats	3-Year Periods	5-Year Periods	Full Tenure (6.8 years on average)
Average (annualized)	0.67	1.30	1.53
% Positive Alpha	59%	64%	68%
Standard Deviation	4.14	3.34	3.64
75th Percentile	2.16	2.58	2.96
25th Percentile	-1.27	-0.47	-0.32
Number of Observations	518	195	518

Exhibit 3 Alpha at the Old Firm

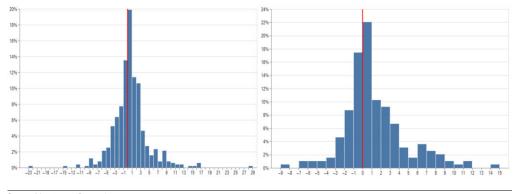
Source: Morningstar Research.

While the distribution of alpha is skewed positively, it extends well into negative territory (Exhibit 4). One third of the fund managers in our sample produced a negative alpha in the trailing five years prior to their departure (41% on their three-year record). Some of these managers may have been let go because of these poor results. But why did these managers resurface at another firm if they had a poor track record? Our study doesn't tell the full story. First, one third of these had a positive alpha when taking into account the full length of their tenure at their old firm. It is also possible that a fund manager had a longer (and better) track record at another fund or a separate account that wasn't captured in our data.

³ Average rolling five-year gross of fees alpha on 12750 surviving and dead US mutual funds (equity & fixed income) from June 2002 to June 2022 with three-month windows, alpha measured with the one factor CAPM model using Morningstar Category Indexes.

⁴ See "The Persistence of Mutual Fund Performance" by Mark Carhart (1997), "The Persistence of Long-Run Abnormal Returns of Mutual Funds" by Edwin J. Elton, Martin J. Gruber, and Christopher R. Blake (1996) or "False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas" by Laurent Barras, Olivier Scaillet, and Russ Wermers (2010)

Also, hiring firms may use a different index than the Morningstar Category index, which may put the manager under a more favorable light; or they may not even look at alpha at all and use other metrics to gauge investment skills. It's also well known that firms are not only looking at past performance when hiring a fund manager. The amount of assets they can attract with their personality and reputation (justified or not) is certainly a consideration in some cases. Several other factors may also come into play such as a fund manager's investment philosophy and approach to managing money, including their views on asset allocation, security selection, risk management, and how well those align with the hiring firm. The fund company may also take into account a fund manager's level of investment experience, including the types of securities and markets they have worked in, as well as their experience managing portfolios of various sizes and complexity. Also, a portfolio manager's communication skills likely would be scrutinized.



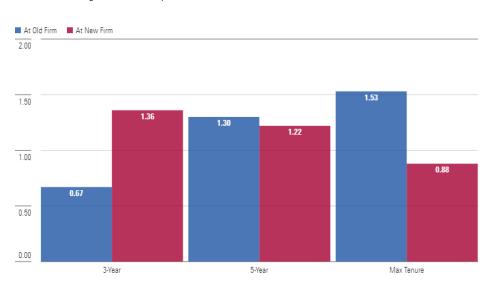


Source: Morningstar Research.

How Did Fund Managers Perform at Their New Firm?

On average, we observe a significant uptick in average alpha generation from the old firm (0.67%) to the new firm (1.36%) when looking at the three-year periods (Exhibit 5a). There are strong incentives for both the asset manager and the new portfolio manager to show good results rapidly. The new firm likely will provide resources and support to make the transition successful. On the portfolio manager side, the motivation and work intensity must be high to perhaps help in delivering good results right away. Another explanation is that the fund manager is helped by a lower asset base. We found that the average fund size at the new firm is 30% lower, on average, than at the previous shop based on the three-year measure. A smaller fund is nimbler and allows larger investments in smaller market capitalizations. These factors should in theory contribute positively to alpha generation.

Finally, newcomers are possibly still surfing on the successful investment style that led them to be hired in the first place. This doesn't appear to be sustainable though. This "alpha pick up" fades away when we lengthen the horizon and look at the five-year periods when the average alpha is broadly similar at the old and new firm. The fund size also tends to increase as we lengthen the horizon, thereby possibly lowering alpha potential. When looking at the performance over the full tenure predeparture and then the track record built at the new firm, the level of excess return drops significantly from a 1.53% annualized alpha to 0.88%. The reality is probably even less favorable than that. The measure of performance at the new firm has a positive bias built in: The five-year and more cohort doesn't include all the managers who were dismissed at their new firm before they reached five years of tenure because their performance was subpar.





3-Year Alpha	At Old Firm	At New Firm
Average (annualized)	0.67	1.36
Standard Deviation	4.14	4.06
75th Percentile	2.16	2.85
25th Percentile	-1.27	-0.53
Number of Observations	518	518
Average Fund Size (USD Mil)	1,152	840
5-Year Alpha	At Old Firm	At New Firm
Average (annualized)	1.30	1.22
Standard Deviation	3.34	3.29
75th Percentile	2.58	2.48
25th Percentile	-0.47	-0.37
Number of Observations	195	195
Average Fund Size (USD Mil)	1,066	971
Max Tenure	At Old Firm	At New Firm
Average (annualized)	1.53	0.88
Average Tenure (Years)	6.78	7.53
Number of Observations	518	518

Source: Morningstar Research.

Exhibit 5b Alpha at the Old and New Firm Split by Asset Class

When we split the sample by broad asset class (equity and fixed income), a similar picture emerges with an increase of alpha on the three-year observations when the manager switches from the old to the new firm (Exhibit 5b). But the five-year observations show that equity managers have produced a slightly lower alpha at the new firm, on average (1.22% versus 1.30%). This doesn't seem to hold for fixed-income managers. The size of the sample is much smaller and therefore less representative. Also a few big positive outliers are pushing the average up. Four of the 10 highest five-year alpha show an R-squared below 10%, indicating that the category index is not a good yardstick to measure alpha in these cases.

Equity	At Old Firm	At New Firm
3-year alpha (annualized)	0.94	1.69
Number of Observations	334	334
5-year alpha (annualized)	1.88	1.41
Number of Observations	150	150
Fixed Income	At Old Firm	At New Firm
3-year alpha (annualized)	0.31	0.79
Number of Observations	150	150
5-year alpha (annualized)	0.11	0.88
Number of Observations	56	56

Source: Morningstar Research.

Finally, we also looked at the funds at the old firm to see how they fared after the departure. We found that managers performed better at their new house compared with how the old fund did at their previous employer in the subsequent years. In the five-year periods after the departure, the fund managers at their new fund outperformed their old fund (under new management), on average, by 52 basis points annualized.

How Likely Are Fund Managers to Replicate Past Success (or Failure)?

Numerous academic studies, and our own research at Morningstar, have shown that past performance in itself is not a reliable predictor of future performance. Is that true for the population of portfolio managers who leave their firms? Are fund managers who leave their firms to join a competitor likely to repeat their success? Are seeming losers able to turn their fortune by jumping on another ship?

Our results show no consistency. The alpha generated at the first firm doesn't tell much about the alpha generated at the new firm. The scatter plot of alpha at the old firm and alpha at the new firm (Exhibit 6) show that both the three-year and five-year cohorts contain a large amount of variability. In other words, fund managers who had significant positive alpha can end up destroying value once at their new firm and vice versa. Since the histograms looked approximately normally distributed, we ran linear regressions on the two variables, which yielded very low R-squared (below 2%) on both cohorts. When we removed outliers with a 90% winsorization,⁵ the overall results did not change. We also ran a multilinear regression using two binary variables on the size of the asset manager (big or small⁶) and the length of tenure at the first house (long or short⁷). The details of the regression can be found in the Appendix. All regressions pointed to the same conclusion: The relationship between alpha at old firm and alpha at new firm is tenuous, and alpha generated at the first firm doesn't explain much of the variation in the alpha generated subsequently.

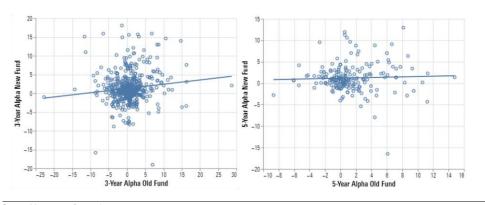


Exhibit 6 Alpha at Old and New Firm (3-Year on the Left and 5-Year on the Right)

Source: Morningstar Research.

Another interesting angle is to look at success rates by measuring the proportion of fund managers who delivered a positive alpha at their first employer and maintained a positive alpha at their new firm (Exhibit 7). First, as discussed previously, there is a positive skew in the alpha distribution before the switch to the new employer happened. On the three-year alpha cohort, 59% of the managers delivered a positive alpha. The success rate is broadly similar when looking at the five-year records with 64% of the managers who delivered excess returns (68% on their maximum tenure at first employer).

According to their five-year records, two thirds (67%) of these "successful managers" repeated their accomplishment at their new firm. Isn't that a sign of encouragement to follow the manager? Not necessarily. The statistics don't include the managers who were not given the opportunity to stay at

⁵ Winsorization at 90% sets all observations greater than the 95th percentile equal to the value at the 95th percentile and all observations less than the 5th percentile equal to the value at the 5th percentile.

⁶ The limit between large and small asset managers was set at USD 50 billion of assets in open-end funds.

⁷ The limit between long and short tenure at the first firm was set at 10 years.

least five years at their new employer. Out of the 335 managers who had built at least a five-year record at their old firm, 140 (42%) were not able to finish a five-year record at the new firm (according to our data). Inclusion of these managers who did not stay long enough lowers the success rate to 35%. Also, it would have been a very risky bet for investors. Among these apparent winners, one third also failed to repeat their past success with a negative gross alpha of 2.2%.

Exhibit 7 Success Rate on 5-Year Alpha Repetition

Out of 195 manager changes 64% had positive 5-year alpha at old firm and 67% of these maintained positive 5-year alpha at new firm but 33% failed at new firm in subsequent 5 years	Number of managers	Average Gross Alpha		
64% had positive 5-year alpha at old firm and	125	2.91		
67% of these maintained positive 5-year alpha at new firm	84	2.96		
but 33% failed at new firm in subsequent 5 years	41	-2.21		

Source: Morningstar Research.

Are Star Managers Likely to Remain Stars?

Not quite. We split our sample by quartile to focus on the highest performers based on the three- and five-year horizons at the first firm and then looked at how they fared at their new firm (Exhibit 8). There is a significant decrease of average alpha after the transition, and the distribution shifts significantly to the left (larger underperformance). In the five-year cohort, the average alpha (1.19%) ends up even slightly lower than the average of the entire sample (1.22%) with some managers severely underperforming. This suggests a strong reversion to the mean and argues against blindly following star managers to their new homes.

Top Quartile	At Old Firm	At New Firm	
Average 3-Year (annualized)	5.51	2.45	
75th Percentile	6.86	4.33	
25th Percentile	2.84	-0.16	
Number of Observations	130	130	
Average 5-Year (annualized)	5.81	1.19	
75th Percentile	7.21	3.82	
25th Percentile	3.53	-1.57	
Number of Observations	49	49	

Exhibit 8 Top Alpha Performers (1st quartile) at Old Firm and Subsequent Performance

Source: Morningstar Research.

Are Bad Managers Likely to Improve?

Yes, somewhat. While investors wouldn't be tempted to follow a manager with an apparent poor track record, it is interesting to see that these managers tend to improve their results. The average alpha generated by the bottom quartile increases significantly when looking at the three-year and five-year horizons, although their alpha at the new firm remains below the average of the full sample (1.36% and 1.22% for the three- and five-year cohort, respectively). So, there's a strong reversion to the mean at play also for the managers who appeared "weaker" at their first employer.

Bottom Quartile	At Old Firm	At New Firm
Average 3-Year (annualized)	-3.85	1.15
75th Percentile	-2.14	2.61
25th Percentile	-4.34	-0.84
Number of Observations	130	130
Average 5-Year (annualized)	-2.18	1.12
75th Percentile	-1.00	1.74
25th Percentile	-2.55	0.05
Number of Observations	48	48

Exhibit 9 Bottom Performers (4th quartile) at Old Firm and Subsequent Performance

Source: Morningstar Research.

Conclusion

Our study looked at the performance of fund managers who transitioned to another firm (or launched their own shop). The goal was to help investors assess the risks and opportunities of transferring their own money along with the manager. The historical evidence shows that fund managers switching to a new firm tend to have enticing performance. It makes it even more tempting for the investor to take the leap. But our study shows that investors should be doubtful that portfolio managers with strong past track records can seamlessly port their investment skills over. Here too, past performance is not a reliable indicator of future performance. On average, managers tend to produce less alpha at their new firm in the long run compared with what they achieved at their former employer. That said, there are a few managers who successfully transitioned to their new firm and continued to generate excess returns for investors, but relying purely on initial track record to identify the best ones to follow looks like a loser's game. Based on our experience, there are several other factors influencing a successful transfer that investors should carefully consider:

Alignment of Investment Philosophy: It's not very common for a manager's past track record and investment philosophy to be completely and directly applicable to the new strategy. The new firm may have a different house investment process or approach. This can impact the transfer of investment skills. The closer the two investment philosophies are, the better.

Support and Resources: It's important to compare the resources at the former employer and new employer. The analytical support, in-house expertise, and tools that fund managers used at their previous firm have likely played a role in generating excess return. The new firm should provide comparable or a better level of resources, such as research and analytical tools, to support the fund manager's investment approach. Without adequate resources, managers may not be able to implement their investment strategy effectively.

Cultural Fit: Fund managers need to fit in with the new culture and values to be able to transfer their skills effectively. Firms with good stewardship practices have better foundations to make the transition a success. Such firms operate within their circle of competence, do a respectable job of aligning manager interests with those of investors in their funds, and charge reasonable fees. It can be a good idea to look at how a firm has handled fund manager integration in the past.

Team Dynamics: If fund managers are joining an established team, they will need to adapt to the existing team dynamics. Also, if the manager previously evolved in a star manager system, it might be hard if teamwork is emphasized at the new firm. Overall, positive team dynamics likely increase the chances that managers can apply their skills effectively.

Fees are a critical part of the equation. If fees charged at the new fund are significantly higher than at the previous fund, it can be a dealbreaker. No matter how talented the portfolio manager is and how well the transition looks from the get-go, if fees are too high at the new shop, investors may lose in the long run.

Appendix

Exhibit 10 Regression Statistics

Intercept 1.28 1.17 1.11 Coefficie	Slope 0.11 0.04 0.09	Error 0.04 0.55 0.06	Value 0.01 0.59 0.18	R-Square 0.01 0.00 0.01 R-	d Observations 518 195 195
1.17 1.11 Coefficie	0.04 0.09	0.55 0.06	0.59 0.18	0.00 0.01	195
1.11 Coefficie	0.09	0.06	0.18	0.01	
Coefficie					195
	ent	Ctal Causa		R-	
	ent	Ctal Famou			
		Std Error	P-Value	Squared	Observations
1.55		0.33	0.00	0.02	518
0.11		0.04	0.01		
-0.12		0.49	0.80		
-0.36		0.38	0.34		
				R-	
Coefficie	ent	Std Error	P-Value	Squared	Observations
1.41		0.48	0.00	195	195
0.03		0.07	0.66		
0.35		0.55	0.52		
-0.48		0.52	0.36		
_	-0.12 -0.36 Coefficia 1.41 0.03 0.35	0.11 -0.12 -0.36 Coefficient 1.41 0.03 0.35	0.11 0.04 -0.12 0.49 -0.36 0.38 Coefficient Std Error 1.41 0.48 0.03 0.07 0.35 0.55	0.11 0.04 0.01 -0.12 0.49 0.80 -0.36 0.38 0.34 Coefficient Std Error P-Value 1.41 0.48 0.00 0.03 0.07 0.66 0.35 0.55 0.52	0.11 0.04 0.01 -0.12 0.49 0.80 -0.36 0.38 0.34 Coefficient Std Error P-Value Squared 1.41 0.48 0.00 195 0.03 0.07 0.66 0.35 0.55

Source: Morningstar Direct.

About Morningstar Manager Research Services

Morningstar Manager Research Services combines the firm's fund research reports, ratings, software, tools, and proprietary data with access to Morningstar's manager research analysts. It complements internal due-diligence functions for institutions such as banks, wealth managers, insurers, sovereign wealth funds, pensions, endowments, and foundations. Morningstar's manager research analysts are employed by various wholly owned subsidiaries of Morningstar, Inc. including but not limited to Morningstar Research Services LLC (USA), Morningstar UK Ltd, and Morningstar Australasia Pty Ltd.

For More Information

Wing Chan Head of Manager Research, Europe and Asia-Pacific +852-2973-4623

M RNINGSTAR®

1 Oliver's Yard 55-71 City Road London EC1Y 1HQ

© 2023 Morningstar. All Rights Reserved. Unless otherwise provided in a separate agreement, you may use this report only in the country in which its original distributor is based. The information, data, analyses, and opinions presented herein do not constitute investment advice; are provided solely for informational purposes and therefore are not an offer to buy or sell a security; and are not warranted to be correct, complete, or accurate. The opinions expressed are as of the date written and are subject to change without notice. Except as otherwise required by law, Morningstar shall not be responsible for any trading decisions, damages, or other losses resulting from, or related to, the information, data, analyses, or opinions or their use. The information contained herein is the proprietary property of Morningstar and may not be reproduced, in whole or in part, or used in any manner, without the prior written consent of Morningstar. To license the research, call +1 312 696-6869.