Family competition via divergence in the trading of funds

Abstract

We examine the influence of managerial structures and characteristics on the level of trading divergence among fund families as well as their effects on the subsequent performance of those families. Fund families with fewer interactions between their funds and managers tend to diverge more in their trading decisions. We find a positive influence of this divergence on the performance of fund families not only in competitive but also in cooperative environments. This finding shows that if cooperation leads a fund family to make different trading decisions than their competitors, they have better results.

Keywords:

Competition; cooperation; fund family; managerial characteristics; mutual funds; performance consequences; trading divergence.

1. Introduction

Previous financial portfolio research has focused on the influence of managerial structures and characteristics on managerial behaviour and fund performance. Another strand of financial literature has also studied the investment skills of managers to detect those that are able to add value to their portfolios. Mutual funds can only outperform other funds whether their managers make divergent decisions from the rest because those different decisions could provide a competitive advantage (see, e.g., Berk and Van Binsbergen, 2015).

The study of the divergence among trading decisions of mutual funds and fund families is important because significant similarities could imply a high fragility in the financial system. Despite the importance of the topic, little is known about (1) the amount of divergence in the trading decisions of fund families and the determinants of this level of divergence and (2) the consequences of the trading divergence level on family performance.

We examine the level of trading divergence (TD[1]) among equity mutual funds within a fund family by following the metric proposed by Gimeno et al. (2022). Note that these authors focus on fund-specific individual incentives to diverge in the investment decisions and this paper analyses the trading divergence at the fund family level. The analysis at the fund family level is relevant for several reasons. First, the trading decisions are made by managers and a given manager can be responsible for several funds in the family. Hence, it is important to account for the managerial structures of fund families. Second, the comparison of the TD level of the funds within each fund family (intra-family TD) and the TD level of the funds of a given family with those of the remaining families (inter-family TD) will provide information about the information dissemination within mutual fund families.

Hence, our first objective is to obtain the intra-family TD level that allows us to explore to what extent the trading decisions made by funds within a specific family differ among them. Then, we explore which are the managerial characteristics of fund families that enhance the intra-family TD level.

Our second objective is to study the performance consequences at the level of the fund family that depend on the degree of TD and the type of fund family. To carry out this study, we examine not only the intra-family TD but also the inter-family TD. The

[1] TD matches TD* in Gimeno et al. (2022).

analysis of both measures allows us to compare the trading behaviour inside and outside the family. On the one hand, the level of the intra-family TD can be used as a proxy of the level of competitiveness within the family. We consider that a high (low) level of intra-family TD classifies those families as competition-oriented (cooperation-oriented). On the other hand, the level of inter-family TD will provide relevant information about the search of "unique" investment opportunities for the family, that is, whether the trading behaviour of a given family is quite different to that of the remaining families. Finally, the difference between the inter- and intra-family TD can be considered as a proxy of the information shared within the family.

We also include some additional analyses about the consequences at the fund family level depending on the degree of TD. Specifically, this paper investigates whether the performance-flow relationship is different depending on the intra-family TD level and whether the risk level of fund families is also influenced by this variable.

Our study makes three distinct contributions to the research on delegated asset management. First, we contribute to the literature on the influence of fund family management structure and manager characteristics on trading behaviour at the family level. The findings show that the intra-family TD is significantly higher within families with a lower level of interconnection among funds and/or managers and a higher percentage of male managers. Second, we contribute to the literature on managerial competition because we propose a novel approach to proxy the competitiveness of each fund family based on the level of trading divergence inside the family and explore its influence on the family performance. Evans et al. (2020) focus on the internal behavior of fund families to classify them as competitive- or cooperation-oriented. However, we compare the trading behavior both inside and outside the family which provide additional information about the skills of fund families to detect investment opportunities and about the information diffusion within the families. We show a significantly positive impact of cooperation within the family when it leads to a high differentiation from other families. Therefore, our findings also contribute to the literature on the benefits of cooperative behaviour within a family as shown by Cici et al. (2017). Third, this paper contributes to the literature about the probability of the transmission of financial difficulties. Delpini et al. (2018, 2019) suggest that significant similarities in fund portfolios could imply a high fragility in the financial system and a high probability in the propagation of financial shocks. Hence, the study of the similarities or the divergence level among trading decisions of mutual funds and fund families is important. Our results indicate that the

level of intra-family TD (competition within the family) has increased over the sample period and the level of inter-family TD has remained quite stable. Hence, we can infer that the fragility of the financial market has reduced over time. In addition, the analysis of the trading divergence is interesting to know the level of diversification offered to potential investors of the fund family which has increased over time.

The rest of the paper is organized as follows: Section 2 contains a literature review and the hypothesis development. In Section 3, we explain the data and TD measures. Section 4 presents the main empirical analyses. Section 5 describes some additional analyses. Section 6 concludes.

2. Literature review and hypotheses

2.1 Determinants of the trading decisions

The literature on mutual funds has shown that team funds make less extreme decisions than single funds do that result in a lower probability of achieving extreme performance in team funds (Bär et al., 2011; Han et al., 2017; Patel and Sarkissian, 2017). In addition, Pool et al. (2015) show that the greater the level of interaction among fund managers, the greater the probability that they will share different opinions and points of view that will lead them to make similar trading decisions for their funds. Therefore, our first hypothesis is as follows:

H1. The intra-family TD is significantly higher in fund families that have a lower level of interactions among their fund managers.

The theory of the diversification of opinions posits that extreme decisions are less likely as the number of managers increases (Bär et al., 2011). Hence, our second hypothesis is as follows:

H2. The intra-family TD is significantly higher within fund families that have a lower average number of managers per fund.

We hypothesize that managers can have more incentives to search investment opportunities which could lead to a higher level of intra-family TD whether the TNA per manager is low because this could imply a higher number of managers within the family and thus, a higher level of competition (see, e.g. Luo and Qiao, 2020). Thus, our third hypothesis is as follows:

H3. The intra-family TD is significantly higher in fund families whose managers handle a lower portion of TNA.

Several authors indicate that women tend to be more risk averse than men and are less competition-oriented (Dwyer et al., 2002; Watson and McNaughton, 2007; Chong et al., 2021). Therefore, our fourth hypothesis is as follows:

H4. The intra-family TD is significantly higher within families that have a higher percentage of male managers.

Experienced managers may feel confident and recognized enough to be able to make divergent decisions. Moreover, they should be more skilled in identifying market opportunities. However, less experienced managers may have more incentives to make divergent decisions to differentiate themselves and improve their reputation. Therefore, our fifth hypothesis is as follows:

H5. The intra-family TD is significantly influenced by the average experience of managers within the fund family.

2.2 Consequences of the management structure on the performance of a fund family

Competition among fund managers may emerge from decentralized management structures that can offer greater autonomy to their managers to search for investment opportunities (Kacperczyk and Seru, 2012; Evans et al., 2020) and to improve performance (Simutin, 2013; Evans et al., 2020). Thus, our sixth hypothesis is as follows:

H6. The subsequent performance is significantly higher for fund families that have a high level of intra-family TD.

Several authors also highlight the significantly positive effect of the cooperative environment on performance because coordinating decisions within fund families allows them to take advantage of their resources (Elton et al., 2007; Fu et al., 2021). However, it is important to note that within those families with a low intra-family TD level, it is different to have a high or low level of inter-family TD. In the first case, the funds of the family take similar investment decisions among them may be due to the shared information and the common access to family resources. However, their investment decisions are different to those of other families. In the second case, the funds follow the market consensus and therefore, there are not large differences between funds inside and outside the family. Thus, our seventh hypothesis is as follows:

H7. The subsequent performance is significantly higher for fund families that have a low level of intra-family TD but a high level of inter-family TD.

3. Data and TD Measure

3.1 Data

Our sample comprises those Spanish fund families that managed at least three Euro equity mutual funds in one month during the sample period (October 2009-June 2020). For each fund family, we calculated its TD level for each month by accounting for those funds classified as Euro equity funds by the Spanish Securities Exchange Commission (CNMV). The sample is free of survivorship bias. ETFs, index funds, and funds with less than two years of data were excluded. These exclusions lead to a final sample of 132 Euro equity mutual funds managed by 24 fund families.

The information on quarterly portfolio holdings was obtained from the CNMV database. We added the information on monthly portfolios that was available in the Morningstar Direct database. The TNA of funds and the family to which each fund belongs were also obtained from the CNMV database. The financial information of stocks (price, return, and market capitalization) was obtained from Datastream. The managers' name and the date on which they assumed responsibility for the fund were obtained from Morningstar. The number of managers' names on each date indicates if the fund is singled-managed or team-managed each month. We calculated the experience of the manager in the Spanish mutual fund industry from the first year that Morningstar reported the manager in the database. We matched all funds from the CNMV database to the funds in the Morningstar database using the funds' ISIN codes. Table 1 presents the summary statistics of the sample.

3.2. TD measure

We first obtained the TD level for each fund pair *i* and *j* in the month *m* following the method proposed by Gimeno et al. (2022):

$$TD_{i,j,m} = \frac{\sum_s |t_{i,s,m} - t_{j,s,m}| - \sum_s ExcTD_{i,s,m,} - \sum_s ExcTD_{j,s,m} - \sum_s FTD_{i,j,s,m}}{\sum_s (Max\,|B_{i,j,s,m}| + Max\,|S_{i,j,s,m}|) - \sum_s ExcTD_{i,s,m} - \sum_s ExcTD_{j,s,m}} \quad (1)$$

where *TD* is the trading divergence level for funds *i* and *j* in month *m*, *t* is the trading weight for any stock *s* (positive when the fund buys and negative when the fund sells), *Max*|*B*| and *Max*|*S*| are the higher weights of the buying and selling decisions, *ExcTD* is the excess trading that cannot be made due to previous holdings, and *FTD* (False Trading Divergence) is the portion of divergence that leads to more similar final positions.

Second, we obtained the intra-family TD level and the inter-family TD level for each fund family *f* in month *m* as follows:

$$\textit{Intra-Family } TD_{f,m} = \overline{TD_{i,j,m}} \qquad \forall\, i\, j \in f \tag{2}$$

$$\textit{Inter-Family } TD_{f,m} = \overline{TD_{i,j,m}} \qquad \forall\, i \in f \text{ and } j \notin f \tag{3}$$

4. Empirical Analyses

4.1 Determinants of the intra-family TD

To examine whether the intra-family TD is influenced by the managerial structure and characteristics of the family, we run the following panel data model for family *f* in month *m*[2]:

$$\textit{Intra-Family } TD_{f,m} = \alpha_f + \beta_1\, \textit{Interaction}_{f,m} + \beta_2\, \textit{Avg \# Mgrs per fund}_{f,m} + \beta_3\, \textit{TNA per Mgr}_{f,m} + \beta_4\, \%\,\textit{Male Mgrs}_{f,m} + \beta_5\, \textit{Mgr Experience}_{f,m} + \beta_6\, \textit{Banking}_{f,m} + \beta_7\, \textit{HHI}_{f,m} + \varepsilon_{f,m} \tag{4}$$

where $\textit{Intra-family } TD_{f,m}$ is the level of divergence among the funds of the family, $\textit{Interaction}_{f,m}$ is the level of interaction between funds and managers of the family. We consider that a fund family has a lower level of interaction when: (1) the percentage of single-managed funds to the total number of funds is higher; (2) the percentage of managers who manage at least one fund jointly with another manager is lower, or (3) the percentage of funds whose manager(s) has (have) at least one team fund and thus, are influenced by common management is lower. $\textit{Avg \#Mgrs per fund}_{f,m}$ is the average number of managers per fund, $\textit{TNA per Mgr}_{f,m}$ is the average TNA per manager, $\%\textit{Male Mgrs}_{f,m}$ is the percentage of male managers to the total number of managers, and $\textit{Mgr Experience}_{f,m}$ is the average number of years of experience in the mutual fund industry of managers. As control variables, we add two important characteristics of fund families in the Spanish mutual fund industry: $\textit{Banking}_{f,m}$ is a dummy variable that equals one when a fund family depends on a banking or insurance company for its governance structure and zero otherwise, and $\textit{HHI}_{f,m}$ is the Herfindahl–Hirschman Index to measure the concentration level of the TNA within a fund family that ranges from zero to one.

Table 2 shows that the intra-family TD is significantly higher within some fund families[3]; specifically, in those that have fewer interactions between managers and funds

[2] The selection of the model is supported by the Hausman test that indicates the use of random effects instead of fixed effects. Robust standard errors are used in the estimation.

[3] In robustness analyses, we split fund families into terciles according to their intra-family TD level. We find that the difference between the average intra-family TD of those families in the top tercile and of those in the bottom tercile is statistically significant at the 1% level. We also observe this result in the yearly analysis. This finding is in line with Kacperczyk and Seru (2012), Casavecchia and Ge (2019), and Evans et al. (2020). These results are available on request.

regardless of the metric used, as expected according to H1. In addition, the TD among funds is significantly higher within families whose managers handle a smaller average portion of TNA, according to H3. Further, we find that the intra-family TD level is significantly higher within fund families that have a higher percentage of male managers, as stated in H4.

4.2 Consequences of the family TD level on performance

Some studies have demonstrated that fund families more oriented to a competitive environment tend to obtain better performance than those more oriented to a cooperative environment (see, e.g. Simutin, 2013 and Evans et al., 2020). Hence, we tested whether the fund family performance was influenced by the intra-family TD level, which is our proxy for the competitiveness within fund families. Note that a high value of intra-family TD level indicates that the trading decisions within the family are not very coordinated and then, we assume a competitive environment in the family. However, there are also several authors who highlight the significantly positive effect of the cooperation environment on performance because fund decisions' coordination within families allows to take advantages of the family resources and maximize its value (Elton et al., 2007; Fu et al., 2021). Hence, we also studied the influence of the difference between the inter- and intra-family TD levels when the intra-family TD was low to isolate those fund families with a cooperative environment. That is, those families in which the intra-family investment decisions are similar (low intra-family TD) but they are quite different to those of other fund families (high inter-family TD). The findings of this analysis could help top-management to encourage or diminish the interests of managers to seek investment opportunities to diverge from others, internally within the family or/and externally with respect to the rest of the families. Specifically, we ran the following panel data model for family *f* in month *m* as follows:

$$Perf_{f,m+n}=\alpha_f+\beta_1\ Intra\text{-}family\ TD_{f,m}+\beta_2 TD\_diff_{f,m}\times D\_Low\ Intra\text{-}family\ TD_{f,m}+controls_{f,m}+\varepsilon_{f,m} \quad (5)$$

where $Perf_{f,m+n}$ is the alpha of fund family *f* in month $m+n$ through the Carhart four-factor model with n ∈ {1,3,6,12} months, $Intra\text{-}family\ TD_{f,m}$ is the divergence level among fund pairs as defined in Equation 2, $TD\_diff_{f,m}$ is the difference between inter- and intra-family TD levels, $D\_Low\ Intra\text{-}family\ TD_{f,m}$ is a dummy variable that equals one when the intra-family divergence level is below the median value of this variable in month *m* and zero

otherwise.[4] In addition, we also add several control variables for the characteristics of the fund family such as *Ln Size* which is the natural logarithm of the fund family size, *Age* is the relativized age of the fund family, *Fees* is the fund family fees, *# Decisions* is the number of trading decisions by the fund family, *Banking* is a dummy variable that equals one when the fund family belongs to a banking or insurance company and zero otherwise, *HHI* is the concentrations level of the TNA within the family. The performance and the control variables at the family level are calculated as a size-weighted average of the funds of the family.

Table 3 shows that the level of intra-family TD has a significantly positive influence on the performance of a fund family as stated in H6[5], which is in line with Simutin (2013) and Evans et al. (2020). In addition, the positive and statistically significant value of the interaction coefficient shows that low levels of intra-family TD can also lead to superior performance for the fund family when the difference between the inter-family and intra-family TD levels is high. Thus, we highlight a significantly positive effect of a cooperative environment on fund family performance when this cooperation leads them to be different from other fund families. This finding is in line with Fu et al. (2012) who find a significantly positive influence of the degree of information sharing and the common access to resources on performance inside the fund family, and it provides additional light to the benefits of internal cooperation that according to Cici et al. (2017) outweigh the associated free-riding costs.[6]

5. Additional analyses

We further investigate the consequences of the TD level of the fund family on the performance-flow relationship and the level of risk assumed by each fund family. The performance-flow relationship is a well-studied issue in the mutual fund literature. Several papers have reported evidence that investor flows respond positively to performance, and are more sensitive to good performance than they are to poor performance (see, e.g., Patel et al., 1991; Sirri and Tufano, 1998). To test this argument,

[4] As a robustness test, we also carry out the analysis with a dummy variable that equals one when the intra-family TD is below the 0.25 quartile.

[5] Results are robust if we also consider 1 as well as 3-factor alphas.

[6] As a robustness analysis, we group families into four categories according to their levels of inter- and intra-family TD using the median criterion. This analysis shows that those families classified as cooperation-oriented in which their funds show a low divergence among their trading decisions but a high ability to differentiate from the rest of families are those with the highest performance. These results are available on request.

we firstly estimate a panel data model on a yearly basis with annual flows as dependent variable and performance measures as independent variables.

Secondly, although fund investors may not be responsive to the TD level of the family because fund holdings are not publicly available and investors might not have precise knowledge to calculate the level of divergence among funds, some studies have demonstrated that investors are sensitive to fund holdings-based measures (e.g., Chen et al., 2000; Kacperczyk and Seru, 2007; Huang and Kale, 2013; and Agarwal et al., 2014, El Ghoul and Karoui, 2017). This leads us to investigate whether the performance-flow relationship is different depending on the level of intra-family TD.

Previous literature argues that to increase the family market share it is important that investors perceive each fund of the family as a differentiated product (see, e.g., Massa, 2003 and Khorana and Servaes, 2012). Therefore, our hypothesis is that fund investors may be more interested on those fund families with good past performance and a high level of intra-family TD. Additionally, we also hypothesize that the performance-flow relationship could be significantly higher for fund families that have a high intra-family TD due to the positive performance consequences of competitive environments.

To test this argument, we assign funds to quintiles based on the intra-family TD level on the premise that investors are more likely to have a qualitative perception rather than a quantitative perception about the level of divergence among families. Specifically, we ran the following panel data model for family *f* in year *y+1* as follows:

$$Flows_{f,y+1} = \alpha_f + \beta_1 Perf_{f,y} + \beta_2 Perf_{f,y-1} + \beta_3 Perf_{f,y} \times Q1 + \beta_4 Perf_{f,y} \times Q5 + controls_{f,y} + \varepsilon_{f,y} \quad (6)$$

where $Flows_{f,y+1}$ is the relative annual flow of family *f* in year *y+1*, $Perf_{f,y}$ and $Perf_{f,y-1}$ is the performance (net returns and four –factor alphas) of fund family *f* in year *y* and year *y-1*, respectively. *Q1* and *Q5* are dummy variables that equals one for the top and bottom quintiles of families sorted on the yearly intra-family TD level, respectively. The flows, performance and the control variables at the family level are calculated as a size-weighted average of the funds of the family. The control variables are defined in equation 5.

Finally, we investigate the consequences of the TD level of the fund family on the level of risk assumed by each fund family considering the annual volatility and the annual idiosyncratic volatility. Financial literature (see, e.g. Brown et al., 1996; Kempf and Ruenzi, 2008 and Chen and Pennachi, 2009) has documented the existence of a "tournament" where managers compete for better performance which will allow them to capture greater fund inflows, and, ultimately, higher compensation.

Some studies indicate that the level of risk-taking is higher when there is a higher number of funds or a higher competition within a family (see, e.g., Kempf and Ruenzi, 2008). This fact leads Shu et al. (2012) to control for the number of funds in the family in their analysis of the impact of religious beliefs on the risk-taking behavior of mutual funds. On the other hand, a high level of competition within the family (a high intra-family TD level) leads to different fund portfolios and therefore a high level of diversification within the family which should be reflected in a lower level of both total and idiosyncratic risk. Hence, there is not a clear hypothesis about the impact of intra-family TD on the risk level assumed by the family. To test the existence of a relationship, we ran the following panel data model for family *f* in year *y* as follows:

$$Volatility_{f,y} = \alpha_f + \beta_1 \ Intra\text{-}family\ TD_{f,y} + controls_{f,y} + \varepsilon_{f,y} \quad (7)$$

where $Volatility_{f,y}$ is the annual volatility or the annual idiosyncratic volatility of family *f* in year *y*, the annual volatility is the standard deviation of the daily raw returns of the family during the year whereas the annual idiosyncratic volatility is the standard deviation of the error terms from annual four-factor model regression of daily family returns on the market portfolio, SMB, HML, and UMD[7], $Intra\text{-}family\ TD_{f,y}$ is the average level of the monthly values of the intra-family TD of family *f* in year *y* as measured in equation 2. The control variables are defined in equation 5.

Panel A of Table 4 shows that family flows are positively influenced by prior-year net returns. However, this influence disappears when the past performance is measured through a more sophisticated metric such as the four-factor alpha. Hence, Table 4 indicates that investor flows are determined by the key variable for them, the returns that they received from their investment. Additionally, when we interact the performance with the intra-family TD quintile dummies, we find that the coefficients on the interaction terms are decreasing in the level of intra-family TD, which indicates that the performance-flow relationship is stronger in those families with a high level of intra-family TD as we have hypothesized. Panel B of Table 4 shows a negative coefficient for the intra-family TD variable, being statistically significant when the annual raw return volatility is considered. This finding reinforces the idea that a higher level of divergence between the funds of a given family leads the family to offer a higher diversification to their potential investors and hence, the family is able to reduce the level of risk assumed.

[7] Note that the volatility of a given family is not the value-weighted volatility of its funds due to the existence of covariances. Hence, we calculate the performance of each family to then calculate the risk level.

6. Conclusions

This paper is the first to explore the level of trading divergence at the fund family level rather than at the fund pair level. We find that fewer interactions between funds and managers within the family, a smaller average portion of TNA handled per manager, or a higher percentage of male managers enhances the trading divergence within the funds of the family (intra-family TD). Our findings also show that a high level of intra-family TD has a significantly positive influence on subsequent performance. In addition, we find that a low level of intra-family TD also has a significantly positive influence when the fund family trades differently from the remaining families that indicates the ability to differentiate the fund family from others. Therefore, we conclude that a competitive environment positively affects the subsequent performance but in certain circumstances a cooperative environment also supports good performance. This paper also shows that the performance-flow relationship is higher in those families with a competitive environment and that the level of risk assumed by these families tends to be lower.

The findings of the study have several implications for fund families, for managers and for financial market regulators. Due to the statistically significant effect of some family management characteristics on the intra-family TD and the influence of this divergence level on family performance, the top management of fund families can make decisions about their structure and the recruitment policy of managers to increase or decrease the trading divergence level among managers' decisions internally and/or externally. On the one hand, the top management could encourage an increase in the level of trading divergence to offer a higher level of diversification and added value to investors through their different funds and to increase the efficiency at the family. On the other hand, families could obtain benefits of low levels of internal trading divergence as long as the internal dissemination of information allows them to exploit trading opportunities and to differ from those of their peers in the remaining families. In addition, fund managers may be interested in knowing the characteristics of fund families in which they may have greater opportunities to differentiate themselves from the rest with their decisions. Finally, market supervisors may be interested in knowing the level of divergence among fund families as a measure of shock contagion risk.

Further research could analyze whether the level of divergence is higher in certain funds in an attempt to identify leader funds which trading decisions are followed by other mutual funds and the characteristics of those leader funds. Additionally, it could be

interesting to detect whether management changes within families could influence their trading divergence level.

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Table 1. Summary statistics of the sample

This table shows the summary statistics for our sample at five date points: December 2009, December 2012, December 2015, December 2018, and June 2020. *#Funds* is the number of funds in our sample; *#Families* is the number of fund families in our sample; *% Banking Families* is the percentage of fund families that depend on the banking sector. *Intra-family TD* is the average level of divergence among the funds of each fund family in existence each date and *Inter-family TD* is the average level of divergence of the funds of each fund family in comparison to the funds of the remaining families. In addition, this table includes the mean, quintile 1 (Q1), and quintile 5 (Q5) values for the following characteristics: *Family size* is the sum of monthly TNA of all the funds within a family in million euros; *Family HHI* is the normalized Herfindahl–Hirschman Index of fund families that ranges from zero to one; *%Single Funds* is the percentage of single funds to the total number of funds within family; *% Mgrs at least one common fund* is the percentage of managers who manage at least one fund jointly with another manager within the family; *% Funds common management* is the percentage of funds whose manager/s have at least one team fund; *Avg #Mgrs per fund* is the average number of managers that each fund has within the family; *TNA per Mgr* is the TNA portion handled per a manager within family; *%Male Mgrs* is the percentage of male managers to the total number of managers within family; and *Mgr Experience* is the average of managers' experience in the mutual fund industry in years.

		Dec.2009	Dec.2012	Dec.2015	Dec.2018	Jun.2020
#Funds		86	64	55	47	39
#Families		17	17	16	15	12
% Banking Families		88%	88%	94%	93%	92%
Intra-family TD		0.7293	0.7519	0.7825	0.7598	0.7843
Inter-family TD		0.8006	0.7808	0.7993	0.7978	0.7942
Family size	Mean	252.773	218.144	342.148	483.720	250.415
	Q1	423.428	264.411	451.499	484.468	274.447
	Q5	30.732	25.402	83.330	86.429	44.500
Family HHI	Mean	37%	46%	42%	43%	43%
	Q1	49%	54%	56%	50%	50%
	Q5	23%	34%	30%	38%	33%
% Single Funds	Mean	35%	35%	52%	49%	53%
	Q1	50%	77%	100%	100%	100%
	Q5	0%	0%	0%	0%	0%
% Mgrs at least one common fund	Mean	43%	62%	44%	56%	49%
	Q1	100%	100%	100%	100%	100%
	Q5	0%	0%	0%	0%	0%
% Funds common management	Mean	68%	68%	50%	56%	47%
	Q1	100%	100%	100%	100%	100%
	Q5	7%	7%	0%	0%	0%
Avg # Mgrs per fund	Mean	1.45	2.03	1.92	2.24	2.00
	Q1	1.93	3.00	2.00	2.67	2.00
	Q5	1.00	1.00	1.00	1.00	1.00
TNA per Mgr	Mean	6.12	4.50	5.22	4.62	4.45
	Q1	8.63	5.22	6.13	5.34	5.46
	Q5	2.86	2.76	2.92	3.26	2.67
% Male Mgrs	Mean	79%	71%	73%	75%	74%
	Q1	100%	100%	100%	100%	100%
	Q5	50%	50%	50%	50%	50%
Mgr Experience	Mean	5.49	7.13	8.65	10.21	11.13
	Q1	8.60	9.09	11.77	14.21	13.04
	Q5	0.68	3.79	5.15	8.05	8.37

Table 2. The determinants of the intra-family TD[8] [9]

Sections A, B, and C of this table show the coefficients and p-values obtained from Equation 4, respectively, with the RE model on a monthly basis. The dependent variable, *% Intra-family TD*, is the level of divergence between the funds of a given family *f* in the month *m,* and the independent variables of fund family *f* in month *m* are the following: *% Single Funds* is the percentage of single funds to the total number of funds; *% Mgrs at least one common fund* is the percentage of managers who manage at least one fund jointly with another manager; *% Funds common management* is the percentage of funds whose manager/s have at least one team fund; *Avg #Mgrs per fund* is the average number of managers per fund; *TNA per Mgr* is the average TNA per manager which is obtained by dividing the natural logarithm of family TNA by its number of managers; *% Male Mgrs* is the percentage of male managers to the total number of managers; and *Mgr Experience* is the average number of years of managers' experience in the mutual fund industry. We also add two important fund family characteristics of the Spanish mutual fund industry: *Banking* is a dummy variable that equals one when a fund family depends on a banking or insurance company for its governance structure and zero otherwise; and *HHI* that is the concentration level of the TNA within the fund family. The ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respectively.

	Section A	***Section B***	***Section C***
	Coefficient (*p*-value)	Coefficient (*p*-value)	Coefficient (*p*-value)
Constant	0.7235*** (0.00)	0.7962*** (0.00)	0.8102*** (0.00)
% Single Funds	0.0661*** (0.00)		
% Mgrs at least one common fund		-0.0898*** (0.00)	
% Funds common management			-0.0793*** (0.00)
Avg #Mgrs per fund	0.0002 (0.98)	-0.0024 (0.64)	-0.0032 (0.53)
TNA per Mgr	-0.0034 (0.13)	-0.0078*** (0.00)	-0.0049** (0.04)
% Male Mgrs	0.0456* (0.07)	0.0480* (0.06)	0.0476* (0.06)
Mgr Experience	-0.0009 (0.51)	0.0005 (0.73)	-0.0008 (0.54)
Banking	-0.0177 (0.79)	-0.0046 (0.94)	-0.0128 (0.85)
HHI	-0.0307 (0.30)	0.0475 (0.11)	0.0266 (0.36)
Wald	29.04*** (0.00)	35.38*** (0.00)	37.76*** (0.00)
R^2	8.55%	11.65%	12.45%
VIF	1.65	1.66	1.59

[8] Model was estimated with robust standard errors.

[9] Variance inflation factors (VIF) values are widely acceptable in the literature.

Table 3. Performance consequences of the family TD level[10] [11]

This table shows the results obtained from Equation 5 with the RE model on a monthly basis. The dependent variable is the performance of fund family *f* in month *m+n* measured with the Carhart four-factor model, with $n \in \{1,3,6,12\}$ months. The independent variables for each family are the following: *Intra-family TD* is the divergence level among fund pairs of family; *TD_diff* is the difference between inter- and intra-family TD levels; *D_Low Intra-family TD* is a dummy variable that equals one when the intra-family TD level is below the median value of this variable and zero otherwise; *Perf* is the current fund family performance weighted by its size; *Ln Size* is the natural logarithm of the average fund family size; *Age* is the relativized age of the fund family; *Fees* is the average fund family fees; *Flows* is the relative fund family money flows weighted by its size; *# Decisions* is the average number of trading decisions by the fund family; *Banking* is a dummy variable that equals one when the fund family belongs to a banking or insurance company and zero otherwise; *HHI* is the concentrations level of the TNA within the family. The *p*-values are reported in parentheses. The ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respective.

	4-factor alpha			
	t+1	*t+3*	*t+6*	*t+12*
Constant	-0.06948%**	-0.075%***	-0.0537%***	-0.0432%***
	(0.04)	(0.00)	(0.00)	(0.00)
Intra-family TD	0.0943%***	0.0859%***	0.0409%***	0.0267%***
	(0.00)	(0.00)	(0.00)	(0.00)
TD_Diff x D_Low Intra TD	0.1302%***	0.1081%***	0.0462%***	0.0236%***
	(0.00)	(0.00)	(0.00)	(0.00)
Perf	-4.1012%	7.7885%***	6.4030%***	-12.7967%***
	(0.13)	(0.00)	(0.01)	(0.00)
Ln Size	0.0016%	0.0014%	0.0024%***	0.0025%***
	(0.52)	(0.13)	(0.00)	(0.00)
Age	0.0002%	-0.0057%	-0.0063%	-0.0083%*
	(0.99)	(0.31)	(0.13)	(0.07)
Fees	-6.2538%	-2.8338%	-2.1097%	-1.7808%
	(0.21)	(0.24)	(0.24)	(0.22)
Flows	-0.0617%**	-0.055%***	-0.0241%*	-0.0176%**
	(0.05)	(0.00)	(0.06)	(0.05)
# Decisions	0.0086%	0.0066%***	0.0055%***	0.0043%***
	(0.12)	(0.01)	(0.00)	(0.01)
Banking	-0.0158%	-0.0019%	-0.0036%	-0.0055%
	(0.23)	(0.64)	(0.25)	(0.11)
HHI	-0.0173%	-0.0056%	0.0096%*	0.0191%***
	(0.30)	(0.47)	(0.10)	(0.00)
Wald	51.04***	151.68***	114.39***	123.96***
	(0.00)	(0.00)	(0.00)	(0.00)
R^2	3.95%	8.87%	6.84%	9.39%

[10] Model was estimated with robust standard errors.

[11] Variance inflation factors (VIF) values are widely acceptable in the literature.

Table 4. Flows and volatility consequences of the family TD level[12] [13]

This table shows the results obtained from Equation 6 and 7 with the RE model on a yearly basis. Specifically, Panel A shows the results of the performance-flow relationship depending on the intra-family TD level where the dependent variable is the annual flow of fund family *f* in year *y+1*. The independent variables for each family are the following: $Perf_y$ and $Perf_{y-1}$ are the current and the one-year lag fund family performance measured through the net returns and the four-factor alpha; Q1 and Q5 are dummy variables that equals one for the top and bottom quintiles of families sorted on the intra-family TD level, respectively. *Ln Size* is the natural logarithm of the average fund family size; *Age* is the relativized age of the fund family; *Fees* is the average fund family fees; *# Decisions* is the average number of trading decisions by the fund family; *Banking* is a dummy variable that equals one when the fund family belongs to a banking or insurance company and zero otherwise; *HHI* is the concentrations level of the TNA within the family. Panel B shows the results of the consequences of the intra-family TD on annual volatility where the dependent variable is the annual volatility or the annual idiosyncratic volatility of fund family *f* in year *y*. The independent variables for each family is intra-family TD level and the same control variables included in Panel A. The *p*-values are reported in parentheses. The ***, **, and * denote statistical significance at the 1%, 5%, and 10%, respective.

	Panel A: Flows					*Panel B: Volatility*	
	Net Return	*4-factor alpha*	*Net Return*	*4-factor alpha*		*Annual Volatility*	*Annual Idiosyncratic Volatility*
	(1)		*(2)*				
Constant	2.0209***	1.5655***	2.0894***	2.7302*	*Constant*	0.0274***	0.0090***
	(0.00)	(0.01)	(0.00)	(0.07)		(0.00)	(0.00)
$Perf_y$	1.3516***	0.6244	1.5000***	0.2296			
	(0.00)	(0.22)	(0.00)	(0.72)			
$Perf_{y-1}$	0.0950	-0.5524	0.1334	-0.4801			
	(0.72)	(0.28)	(0.62)	(0.42)			
$Perf_y$ *x Q1*			0.0702	2.7758*	*Intra-family TD*	-0.0078***	-0.0008
			(0.92)	(0.10)		(0.00)	(0.40)
$Perf_y$ *x Q5*			-1.2807	1.2438			
			(0.21)	(0.63)			
Ln Size	-0.1537***	-0.1099***	-0.1591***	-0.1897***	*Ln Size*	-0.0014***	-0.0003***
	(0.00)	(0.00)	(0.00)	(0.01)		(0.00)	(0.00)
Age	-0.1496	-0.2360	-0.1390	-0.3199	*Age*	0.0026	0.0010
	(0.55)	(0.35)	(0.60)	(0.84)		(0.22)	(0.22)
Fees	0.0770	0.2655	0.0678	0.4409	*Fees*	-0.0012	-0.0026**
	(0.84)	(0.51)	(0.86)	(0.39)		(0.71)	(0.03)
Flows	0.0142	0.1067	-0.0071	0.1053	*Flows*	-0.0006	-0.0002
	(0.87)	(0.19)	(0.93)	(0.25)		(0.35)	(0.37)
# Decisions	0.0863	0.0570	0.0889	0.0139	*# Decisions*	0.0016***	0.0001
	(0.24)	(0.46)	(0.24)	(0.90)		(0.01)	(0.69)
Banking	0.0655	0.0566	0.0402	0.0734	*Banking*	0.0021	-0.0013**
	(0.69)	(0.73)	(0.82)	(0.59)		(0.12)	(0.03)
HHI	-0.6804***	-0.5228**	-0.6712***	-0.5903**	*HHI*	-0.0035	-0.0007
	(0.01)	(0.05)	(0.01)	(0.05)		(0.11)	(0.39)
Wald	57.3***	24.22***	59.74***	2.76***	Wald	57.66***	20.16***
	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.01)
R^2	21.61%	11.49%	22.07%	8.97%	R^2	17.32%	9.88%

[12] Model was estimated with robust standard errors.

[13] Variance inflation factors (VIF) values are widely acceptable in the literature.