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Managerial characteristics and performance of eurozone mutual funds

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Abstract

We investigate the relation between observable managerial characteristics (i.e., gender, age, tenure, professional qualifications, and advanced education) and performance in diversified equity mutual funds domiciled in the eurozone. We find that differences in the fund alphas are statistically significant only in groups based on age, tenure, and professional qualifications (i.e., chartered financial analyst [CFA]). We also find a significant positive relation for age and CFA certification with a fund's risk-adjusted performance and a significant negative relation for tenure. However, we find no significant effect for gender and advanced education (i.e., master of business administration [MBA]). The differences in risk taking are significantly related only with age and tenure; the former has a negative and the latter a positive relation with risk taking.

JEL CLASSIFICATION
G2, G23

1 | INTRODUCTION

Investors increasingly pay attention to who manages their funds. Indeed, information services (e.g., Morningstar, Bloomberg) contain the biographies of fund managers, and the performance of managers at large funds typically make front page news in the business sections of magazines and newspapers. An important question that arises, therefore, is whether a fund's performance is related to managerial characteristics. Our objective is to examine

whether the observable managerial characteristics of age, gender, tenure, advanced education, and professional qualification are significantly related to the performance and risk taking of diversified equity mutual funds in the eurozone.

The global mutual fund industry has grown considerably over the last 2 decades, with total net assets increasing from $6.96 trillion in 2000 to over to $67.1 trillion by the end of 2020, almost 42% of which are held by equity funds (Investment Company Institute, 2021). Despite the growing interest in active fund management among investors, its track record has been unimpressive. Indeed, there is considerable evidence that the performance of actively managed equity funds is poor and that in most cases they fail to beat a set of benchmarks on a net-of-fees basis (see, e.g., Busse et al., 2010; Carhart, 1997; Del Guercio & Reuter, 2014; Fama & French, 2010; Gruber, 1996). However, a strand of the literature provides evidence that fund managers do display some skill (see, e.g., Brown & Goetzmann, 1995; Elton et al., 1996; Grinblatt & Titman, 1992; Hendricks et al., 1993). These studies indicate that managerial characteristics that indicate ability, skills, effort, and knowledge (e.g., higher SAT and GMAT scores, MBA degree from highly ranked school, CFA certification) are significantly related to fund performance.[1] Intuitively, these characteristics should be related to fund performance because managers who display them should have greater human capital and therefore better performance. Chevalier and Ellison (1999a) find that managers who attend undergraduate institutions with higher overall SAT scores generate higher risk-adjusted excess returns. They attribute this finding to the greater innate abilities of the manager, the benefits of a better education, and the information benefits of a better professional network (Cohen et al., 2010). Recently, Tan and Sen (2019) find that the educational diversity of mutual fund managers, in terms of both educational degree and specialization, have a positive effect on fund performance. Gottesman and Morey (2006) report that the mean GMAT score of a manager's MBA program is positively and significantly related to the fund's performance. Furthermore, they report that managers with MBAs from *Business Week*'s top 30 programs have better performance than managers with MBAs from unranked programs and managers without MBAs. Golec (1996) also finds that investors can expect greater risk-adjusted performance from young managers who hold an MBA and have longer tenure at their funds.

Although the human capital argument can also be applied to managerial tenure, one could argue that managers with longer tenures have lower drive to excel than managers who have only recently been put in charge and have yet to prove themselves (Golec, 1996). Chevalier and Ellison (1999a) argue that young managers either have better performance because they are eager to advance their careers and therefore work harder than older managers or perform worse because of lack of experience. Shukla and Singh (1994) report that funds with at least one CFA manager outperform funds with no CFA manager; Switzer and Huang (2007) report similar findings. There are several reasons why the performance of female fund managers might be different from the performance of male fund managers. First, if investors are prejudiced against females, funds managed by female managers might receive lower fund inflows compared to funds managed by male managers, which could subsequently lead to inferior performance (see, e.g., Niessen-Ruenzi & Ruenzi, 2019; Rakowski & Wang, 2009). Second, research shows that female investors are more risk averse (see, e.g., Barber & Odean, 2001; Byrnes et al., 1999; Niessen-Ruenzi & Ruenzi, 2019; Sunden & Surette, 1998), which in equilibrium is expected to lead to lower returns.[2] Finally, Barber and Odean (2001) show that male managers trade 45% more than female managers, which results in a net return reduction of 2.65% per annum compared to a reduction of 1.72% per annum for female managers.

Our study is primarily motivated by the limited focus of the literature on European mutual funds. Indeed, although European equity mutual funds hold about 16.5% (i.e., $4.64 trillion) of total worldwide net assets in equity mutual funds (i.e., $28.18 trillion), most of the literature focuses on the US mutual fund market. Exceptions are

[1]SAT stands for Scholastic Assessment Test and is a test intended to assess writing, critical reading, and math skills for university and college admission in the United States. GMAT stands for Graduate Management Admission Test and is a test intended to assess certain analytical, writing, quantitative, verbal, and reading skills for admission to a graduate management program, such as master of business administration (MBA). CFA stands for chartered financial analyst and is a certification of the required skills and knowledge needed by investment and financial professionals.

[2]However, a recent study by Kirchler et al. (2018) shows no significant differences in risk taking by financial professionals of different genders.

Otten and Bams (2002) who find that European mutual funds generate a positive net-of-fees alpha, Ferreira et al. (2013) who find that country characteristics can explain the performance of European mutual funds, and Banegas et al. (2013) who find that several macroeconomic variables can help predict the performance of European mutual funds. European country-specific studies include Dermine and Röller (1992), Ward and Saunders (1976), Blake and Timmermann (1998), Blake et al. (2017), Dahlquist et al. (2000), and Cesari and Panetta (2002).

Our study is also motivated by the differences between the European and US mutual fund industries, mainly in terms of market structure and organization, regulation, size, and importance. First, US banks and other financial institutions (e.g., insurance firms) have a relatively small share of the mutual fund market and their key competencies are not related to investment. Therefore, they outsource the management of their funds to independent asset management companies (Del Guercio & Reuter, 2014; Frye, 2001). The mutual fund market in Europe, however, is dominated by banks and other financial institutions that tend to have their own asset management operations (Ferreira et al., 2018; Otten & Bams, 2002; Ramos, 2009; Tran, 2015). Empirical evidence suggests that mutual funds with outsourced management underperform funds that are managed in house (Chen et al., 2013; Chuprinin et al., 2015; Ferreira et al., 2018; Massa & Schumacher, 2020; Moreno et al., 2018).[3] Second, the US mutual fund industry tends to have more hierarchies compared to the European industry, which results in costs that may eat into fund performance (Aghion & Tirole, 1997; Ferreira et al., 2012; Stein, 2002). Third, in the United States and Europe all mutual funds must abide by the rules set by the Investment Company Act of 1940 and the Collective Investment in Transferable Securities directive (UCITS), respectively. Although both regulatory frameworks aim to ensure that funds are well diversified, UCITS also aims to affect the incentive of funds in the European Union to operate in different markets by promoting the outsourcing of portfolio management.[4] Specifically, EU-based management companies must hold passports that allow them to manage funds domiciled in other EU countries. Fourth, although the European mutual fund market lags the US market in terms of both size and importance, over the last 10–15 years its economic and investment importance has grown considerably and has attracted much attention from investors. This is likely due to the integration of the European financial markets and the introduction of the common euro currency over the last 2 decades. For example, by the end of 2005 there was $6.05 trillion of net assets under management in European mutual funds, which by the end of 2020 grew to $21.8 trillion. These numbers compare to $8.90 trillion in 2005 and $29.3 trillion in 2020 for US mutual funds. Therefore, the European mutual funds increasingly hold more corporate equity and play a significant role in the determination of stock prices (Gompers & Metrick, 2001; Grinblatt et al., 1995).

Furthermore, the average size of European mutual funds is much smaller than the average size of US funds (i.e., $0.38 billion for European funds as opposed to $2.90 billion for US funds). However, this fact does not explain the asymmetric effect of scale on fund performance because diminishing returns to scale are not a universal truth (Ferreira et al., 2012).[5] This is likely due to the liquidity constraints faced by US funds, which tend to invest in small and illiquid domestic stocks, whereas this is not the case for European funds (Chen et al., 2004; Pollet & Wilson, 2008). This finding may also indicate that fund flows may not eliminate performance persistence as suggested by the Berk and Green (2004) model. Fifth, there is evidence that country characteristics may help

[3]Massa and Schumacher (2020) and Chen et al. (2013) argue that these results may be due to conflicts of interest between the asset management division and other divisions within the same financial institution. The literature also indicates a conflict of interest between funds affiliated with banking groups and their investors (Berzins et al., 2013; Ferreira et al., 2018; Golez & Jose, 2015; Hao & Yan, 2012; Johnson & Marietta-Westberg, 2009; Mehran & Stulz, 2007). These studies suggest that bank funds are more likely to be used to support banks' other activities. Also, these management companies manage funds from both their own banks and external investors and therefore are likely to face information asymmetry regarding fund management. Indeed, external investors do not have full information about the management of funds and hence do not fully understand how managers allocate their assets to various funds. Ferreira et al. (2018) emphasize that conflicts of interest in bank groups and their impact on bank-affiliated funds are less pronounced in US funds.

[4]For example, Section 12 of the Investment Company Act of 1940 limits the amount of assets that can be invested in other investment companies, and Rule 35d-1 aims to make sure that a fund's holdings (i.e., at least 80%) are reflective of the fund's name and prospectus.

[5]Ferreira et al. (2012) find that small funds perform better than large funds only for US funds, but this is not true for the rest of the world, including European mutual funds. They also report that the negative size effect in US funds is economically significant, as a 1 *SD* increase in fund size yields a 15 basis point (bps) decline in the next quarter's fund net return, whereas in Europe it yields 11 bps in next quarter's net fund return.

explain fund performance. Ferreira et al. (2012, 2013) and Khorana et al. (2005) find a strong positive relation between fund performance and a country's level of financial development. Investor protection and law enforcement also have a positive and statistically significant effect on fund performance. Furthermore, funds domiciled in countries with a common law tradition (i.e., United States) perform better than funds domiciled in countries with a civil law or other legal system (i.e., Europe).

In sum, there are sound reasons to believe that there are important differences in the determinants of performance between US and European mutual funds. These differences motivate us to examine the relation between managerial characteristics and mutual fund performance. This potentially significant relation has direct implications for the selection of mutual funds by investors and likewise for the selection of managers by mutual funds. The findings of our study also have implications for the efficiency of the European mutual fund industry, as no specific kind of manager should be able to consistently beat the market and earn abnormal returns in efficient markets.

We use monthly returns as well as information on observable managerial characteristics from January 2005 to December 2020 for 383 eurozone-domiciled diversified equity funds. We first examine the performance of funds run by managers with different characteristics using the following proxies for performance: the alphas obtained from the capital asset pricing model (CAPM) that controls for market risk, Fama and French's (1993) three-factor (3FF) model that also controls for size and book-to-market, Carhart's (1997) four-factor (4FF) model that also controls for momentum, and Fama and French's (2015) five-factor (5FF) model that also controls for profitability and investment patterns. Our first set of results indicates that the differences in fund alphas are statistically significant only in the subgroups based on age, tenure, and CFA certification. This evidence shows that managerial characteristics such as gender and whether the manager has an MBA are not strongly related to a fund's risk-adjusted performance.

We then examine the relation between funds' excess monthly returns, relative to their primary benchmarks, and the characteristics of the managers in charge. We find that age, tenure, and CFA certification have a statistically significant effect on the funds' excess returns, but this is not the case for gender and MBA. In particular, older managers with shorter tenure generate higher excess returns than young managers and managers with longer tenure. Indeed, a 10-year increase in the manager's age generates an approximately 1.24% larger excess return per annum, but a 10-year increase in managerial tenure leads to an approximately 0.61% smaller excess return per annum. Furthermore, fund managers who have a CFA generate a larger excess return of 2.35% per annum. We then use a battery of Fama–MacBeth (1973) cross-sectional regressions to examine the relation between risk-adjusted returns and managerial characteristics. We find that age and CFA certification have a significant positive relation and that tenure a has significant negative relation with the fund's risk-adjusted performance, respectively. Gender and MBA are statistically insignificant in most model specifications. With regard to fund characteristics, we also find that fund size and turnover are positively and significantly related to risk-adjusted performance.[6] Differences in the risk taking of mutual funds (i.e., systematic, unsystematic, and total risk) are not statistically significant for most managerial characteristics except for age and tenure, which have a positive and a negative relation to risk taking, respectively.

Our article makes several contributions. First, we contribute to the broad literature on the performance of mutual funds, especially the literature that examines the relation between managerial characteristics and performance (e.g., Atkinson et al., 2003; Chevalier & Ellison, 1999a; Golec, 1996). Second, we contribute to the limited literature on the behavior of European equity mutual funds (e.g., Banegas et al., 2013; Ferreira et al., 2013; Otten & Bams, 2002). Third, we provide evidence that gender and advanced education (i.e., MBA) are not significantly related to fund performance, which might have important implications for investors when selecting a fund.

[6]Although most studies show a negative effect of turnover on fund performance, they tend to use returns net of fees and other expenses. In contrast, we use gross returns as we are concerned only with the performance of fund managers, which might explain our finding.

2 | DATA SELECTION AND DESCRIPTION

2.1 | Sample construction

All data come from Morningstar Direct and cover January 2005 to December 2020. The use of cross-sectional data and the inclusion of defunct funds in our sample reduces the potential issues that might relate to survivorship bias. The initial sample contains 3360 diversified equity funds that are denominated in euros, domiciled in continental Europe, and the eurozone is the investment focus. First, we exclude index funds and ETFs because their managers are not involved in active fund management. Second, we drop sector-specific funds and funds not assigned to one of the classes in the Global Investment Fund Sector (GIFS) as well as all non-euro-denominated funds. Third, we drop funds that do not have 30 consecutive monthly returns available because this is the minimum number of data points we use in our empirical analysis. Fourth, for funds with multiple share classes, we use only the oldest share class as the representative one. Fifth, we exclude funds for which there are no data on their managers or when the funds provide only the first initial of the manager's name, which makes identification difficult or imprecise.

Finally, we exclude all funds that are team managed over the whole sample period. Including team-managed funds and choosing, for example, the manager with the longest tenure to stand in for the whole or identifying a lead manager as in Li et al. (2011) would be impossible. Although including team-managed funds would have the advantage of a larger sample size, it would be unrealistic to attribute the performance of a fund to a single manager simply because they have the longest tenure or have some other characteristic that sets them apart from the other managers. Chen et al. (2004) also show that the organizational structures of team-managed and solo-managed funds differ. This difference makes them hard to compare, and thus performance attribution becomes difficult without knowledge of how responsibilities are divided within the fund. Although other studies (e.g., Chevalier & Ellison, 1999a; Harvey et al., 2021) only require managers to be the sole manager of the fund for a sufficient part of or whole sample period, for the sake of more accurate performance attribution we include a fund in our sample only if a single manager was in charge over at least 30 consecutive months. For funds that are team managed for only part of our sample period, but the sole manager was part of that team, we include the fund in our sample. For example, if a fund enters our sample in 2012 and was team managed between 2012 and 2013, we add the fund if the sole manager from 2013 onward was part of the management team from 2012 to 2013. We believe that this is a reasonable compromise because it has the benefit of including more funds in our sample without the cost of an inaccurate attribution of fund performance.

Morningstar's tenure variable is calculated as of the end of the sample period.[7] Thus, for the current manager to have managed the fund for the whole sample period, a tenure of at least 30 months is necessary. To establish the gender of the fund managers, we look up their first names in the Popular Baby Names database that is publicly available on the US Social Security Administration website.[8] Identifying the gender in this way works well for most funds. The remaining managers are assigned a gender manually, which in most cases is straightforward (e.g., Tommi, Cédric, José, Fabio, etc.). Where the name is uncommon or unisex, it is confirmed using either the GenderChecker website, the pronouns (i.e., he/she) in the manager biographies available on Morningstar, or via an Internet search for the manager's name.[9]

To obtain the manager's age, we adopt a slightly different approach from Chevalier and Ellison (1999a), Atkinson et al. (2003), and Li et al. (2011), all of whom assume that managers are 21 years old upon graduation. These studies use data on US funds that hired US-educated managers for whom 3-year undergraduate degrees are common. However, our sample is dominated by funds domiciled in either France or Germany, and only in recent years have these countries adapted their higher education systems in such a way that bachelor's degrees usually

[7]Morningstar reports both the longest and the average manager tenures, which for a single manager are identical.
[8]https://www.ssa.gov/oact/babynames/limits.html.
[9]www.genderchecker.com.

take 3 years and master's degrees take between 1 and 2 years.[10] Therefore, we take a different approach in calculating the age of the fund manager. Where the fund manager holds an undergraduate degree from a US or UK university, we follow the 21-year rule adopted by other studies. For all other managers, we take the year in which they started studying for their first degree as a proxy for when they were 18 or 19 years old.[11] The graduation dates are sometimes available in the manager biography sections in Morningstar; when they are not available, we retrieve them from the managers' LinkedIn profiles, the Citywire website, or their funds' websites.

We follow the same approach to obtain information on the educational background of fund managers and whether they hold an MBA degree and/or CFA certification. Furthermore, some managers might not report all of their educational achievements and professional qualifications on LinkedIn, which might introduce some bias to our sample. However, because both the CFA and MBA are prestigious qualifications for financial professionals, we expect most managers to list them online for reputational reasons and therefore expect the effect of underreporting fund managers' educational achievements to be miniscule. In summary, we miss MBA- and CFA-related information for about 27% of the funds in our sample and age-related information for about 36%.

2.2 | Data description

The final sample consists of 383 funds, 86 of which are defunct. This is comparable to the sample sizes in similar studies on manager characteristics, for example, 492 in Chevalier and Ellison (1999a) and 358 in Babalos et al. (2015). Table 1 provides an overview of the funds in our sample that are based on the classifications in the S&P's GIFS. Large-cap funds are the most popular type of fund in our sample, with the Europe Large-Cap Blend Equity funds (124) constituting almost one-third of the sample. The fraction of female-managed funds in our sample is 14.62%, which is larger than most comparable studies. For example, Chevalier and Ellison (1999a) report a 7% share of female managers in their sample, Atkinson et al. (2003) a 5.6% share, Niessen-Ruenzi and Ruenzi (2019) an almost 11% share, and Babalos et al. (2015) a 16.5% share. The number of funds with managers holding an MBA and/or a CFA are relatively evenly distributed across the different fund types. The average managerial age ranges from 41 years and to 51.74 years, and the average tenure ranges from 8.25 years to 13.43 years.

In addition to managerial characteristics, we collect fund-level data that consist of the funds' monthly return, monthly standard deviation, monthly size, age, annual management fee, annual maximum front-loaded sales charge, and annual turnover ratio.[12] The monthly return is calculated by calculating the change between the starting and ending net asset values within a month, reinvesting all income and capital gains distributions during that month, and dividing by the starting net asset value. No adjustments are made for differences in the funds' fees or other costs such as sales charges. This is because although fees have an impact on investors' take-home returns, our focus is on fund managers' portfolio performance. We report summary statistics for our main data Table 2. Panel A presents summary statistics for fund characteristics and Panel B for managerial characteristics.

[10]The traditional French undergraduate degree (i.e., Maîtrise) typically takes 4 years to complete, whereas the German undergraduate degree (i.e., Diplom) is awarded once students have successfully passed all program modules and completed their thesis. This process could take anywhere between 4 and 10 years. In some cases, it takes even longer because German and French universities do not charge tuition fees, which makes longer studying periods more frequent than in the United States or United Kingdom.

[11]Although some federal states have changed this in recent years, secondary school in Germany usually takes 9 years instead of 8. Hence, some school leavers are 19 instead of 18 when they first enroll in university.

[12]Size is the monthly total net assets of the fund in millions of euros, fund age is the time in years since the start of the fund, management fee is the percentage of the fund's monthly net assets paid to its manager, maximum front load is the maximum sales charge of a fund, and turnover is the percentage of the fund portfolio's holdings that has changed over the past year.

TABLE 1 Sample overview.

Fund type	No. of funds	Female	% female	MBA	% MBA	CFA	% CFA	Average age (years)	Average tenure (years)
Europe Equity Income	11	1	9.09	1	9.09	1	9.09	43.86	9.33
Europe Flex-Cap Equity	43	4	9.30	2	4.65	8	18.60	47.81	10.18
Europe Large-Cap Blend Equity	124	25	20.16	8	6.45	15	12.10	46.24	9.72
Europe Large-Cap Growth Equity	22	2	9.09	0	0.00	4	18.18	45.29	8.25
Europe Large-Cap Value Equity	40	5	12.50	2	5.00	8	20.00	43.52	10.84
Europe Mid-Cap Equity	14	5	35.71	1	7.14	2	14.29	46.40	10.02
Europe Small-Cap Equity	14	0	0.00	1	7.14	1	7.14	47.50	11.86
Eurozone Large-Cap Equity	11	1	9.09	1	9.09	0	0.00	46.86	11.75
France Large-Cap Equity	51	8	15.69	3	5.88	1	1.96	50.50	12.52
France Small/Mid-Cap Equity	37	5	13.51	3	8.11	1	2.70	51.74	13.43
Germany Large-Cap Equity	12	0	0.00	0	0.00	3	25.00	45.60	11.92
Germany Small/Mid-Cap Equity	4	0	0.00	1	25.00	2	50.00	41.00	8.99
Total	383	56	14.62	23	6.01	46	12.01	46.39	10.73

Note: This table provides a summary of the managerial characteristics of the funds in our sample by fund type. The fund type is defined according to S&P's Global Investment Fund Sector (GIFS). "No. of funds" indicates the number of funds in our sample, "Female" is the number of funds with a female manager, "% female" is the percentage of funds with a female manager in our sample, "MBA" is the number of funds in which the manager holds a master of business administration degree, "CFA" is the number of funds in which the manager has chartered financial analyst certification, "Average age" is the average manager's age in years, and "Average tenure" is the average manager's tenure in a particular fund. All fund data come from Morningstar and cover January 2005 to December 2020.

TABLE 2 Summary statistics of the mutual fund sample.

Panel A: Fund characteristics							
	No. of funds	Return (%)	*SD*	Size (million €)	Management fee (%)	Maximum front load (%)	Turnover (%)
All	383	0.88	0.43	248.80	1.55	2.93	121.86
Male	327	0.87	0.42	256.52	1.57	2.92	124.14
Female	56	0.90	0.45	203.70	1.43	2.97	108.52
Age < 46	121	0.83	0.41	255.40	1.58	2.89	92.88
Age ≥ 46	125	0.93	0.46	210.12	1.45	3.10	106.70
Tenure < 9	185	0.92	0.40	225.55	1.49	2.80	128.11
Tenure ≥ 9	198	0.84	0.44	270.53	1.62	3.03	116.00
CFA	46	0.97	0.40	367.62	1.59	3.10	92.11
No CFA	232	0.88	0.46	242.52	1.51	2.83	104.51
MBA	23	0.85	0.41	282.22	1.65	2.75	87.77
No MBA	255	0.87	0.46	256.82	1.55	2.64	95.93

Panel B: Managerial characteristics						
	Male	Female	Average age (years)	Average tenure (years)	CFA (%)	MBA (%)
All	327	56	47.09	10.73	16.50	8.30
Male	327	—	46.92	10.72	17.70	9.50
Female	—	56	48.00	10.78	10.90	2.20
Age < 46	105	16	40.25	9.19	25.62	8.26
Age ≥ 46	102	23	53.71	12.03	6.40	8.80
Tenure < 9	155	30	43.73	6.99	18.12	9.42
Tenure ≥ 9	172	26	50.18	14.23	15.00	7.14
CFA	41	5	42.23	9.32	—	8.67
No CFA	191	41	47.94	10.65	—	8.19
MBA	22	1	48.29	9.44	17.39	—
No MBA	210	45	46.89	10.52	16.47	—

Note: This table presents summary statistics for all funds in our sample as well as for different pairs of fund subgroups defined on the basis of managerial characteristics. The pairs of subgroups are defined in terms of gender (male, female), age (less than 46 years, more than 46 years), tenure (less than 9 years, greater than or equal to 9 years), CFA certification (has a chartered financial analyst [CFA] certification, does not have a CFA certification), and MBA qualification (i.e., has a master of business administration [MBA], does not have an MBA). For age and tenure, the integer closest to the median value was chosen as a cutoff for the split into two groups. The number of funds in a particular group is provided, as well as average monthly return and standard deviation in the fund monthly returns. Size is the average monthly total net assets of the fund in millions of euros, management fee is the average percentage of the fund's monthly net assets paid to its manager, maximum front load is the average of the maximum sales charge for the funds in our sample, and turnover is the average percentage of the fund portfolios' holdings that have changed over the past year for all funds in a particular subgroup. All fund data come from Morningstar and cover January 2005 to December 2020.

In the raw data, female-managed funds, on average, have a marginally higher return, are slightly riskier, are smaller in size, charge a lower management fee, but have a similar front load compared to male-managed funds. Furthermore, like other studies (e.g., Barber & Odean, 2001), male managers trade more than female managers, which manifests itself into higher turnover ratios. In the raw data, fund managers older than 46 years old have on average slightly better performance (i.e., 0.93%) than younger managers (i.e., 0.83%), although this superior performance comes with higher risk (i.e., 0.46) and turnover (i.e., 106.70%). In addition, managers with short tenure trade considerably more than managers with long tenure, and their performance is higher and comes at a lower risk. CFA holders have, on average, superior performance, manage larger funds, and trade considerably less compared to managers with no CFA. Funds with managers with no MBA degree have slightly better performance; however, this comes with higher risk and greater turnover.

The average age of all fund managers in our data set is just above 47 years with tenure of about 10.7 years. Furthermore, 16.5% of all managers have a CFA certification and 8.3% an MBA degree. These numbers do not vary much between male and female managers, except for female managers with an MBA and CFA. It is difficult to explain the low fraction of female managers with an MBA (i.e., 2.20%). Domicile effects are not the cause, as the fraction of MBA graduates is similar across European countries. We consider the following as possible explanations: Fund managers frequently have a background in the disciplines of science, technology, engineering, and mathematics (STEM). Females are underrepresented in STEM disciplines and therefore are likely to have a business background more often than men. As a result, they might choose to pursue an MBA less often than males as the females already have an academic background in business. Furthermore, females might expect to hold a management position less often later in their career and therefore decide not to pursue an MBA. Underreporting the academic qualifications of female managers on LinkedIn might also be possible. These reasons might also explain the lower number of female managers with a CFA (i.e., 5) as opposed to male managers with a CFA (i.e., 41) in our sample. However, having said that, it is important to stress that these are simply conjectures and unfortunately no further information is available that could lead to more plausible explanations.

Moreover, the fraction of managers with an MBA and/or CFA in our sample is lower than in other studies. For example, Atkinson et al. (2003) report that 58.21% of male and 46.67% of female managers have an MBA, with 37.31% of male and 45% of female managers holding a CFA. Golec (1996) reports that 64% of the managers in his sample have MBAs. However, both these studies use US data. Indeed, the most obvious reason for the lower fraction of managers with an MBA and/or a CFA in our sample is that both qualifications are much less common in continental European countries than in the United States and United Kingdom. Unfortunately detailed statistics about CFAs holders are difficult to obtain, but Germany's CFA Society, for example, discloses that it has roughly 2500 members, 95% of which (i.e., 2375) hold CFA certifications.[13] The French CFA Society discloses that in 2014 it had about 700 members.[14] To put these numbers into perspective, between 1963 and 2016, 209,561 candidates worldwide had passed the CFA Level 3 exam, most of which had likely been based in the United States and United Kingdom; indeed, the CFA Society of New York alone has more than 10,000 members.[15] MBA graduates are also much less common in Germany. Furthermore, although pursuing a part-time MBA is popular in the United States and most of the English-speaking world, in continental Europe, this idea has only started to emerge in the years following the Bologna Process.[16] Although MBA graduates are also uncommon in France, French executive MBA programs offered by a number of prestigious business schools (e.g., INSEAD, EDHEC, HEC Paris) nowadays are frequently ranked among the best in the world in the rankings by the *Financial Times*.[17] These rankings contrast with not a single German MBA program making it into the top 50.

[13] https://www.cfa-germany.de/de/infos-fuer-arbeitgeber/erfolgsfaktor-cfa.
[14] https://www.cfasociety.org/france/about-us/about-cfa-france.
[15] https://www.cfany.org/.
[16] The Bologna Process is a cooperative of 48 European countries in the field of higher education that aims to ensure the comparability of the standards and quality of higher education qualifications.
[17] https://rankings.ft.com/rankings/2710/global-mba-ranking-2017.

3 | METHODOLOGY AND EMPIRICAL RESULTS

3.1 | Performance of European equity mutual funds

We first apply the CAPM, Fama and French's (1993) three-factor (3FF) model, Carhart's (1997) four-factor (4FF) momentum model, and Fama and French's (2015) five-factor (5FF) model to the monthly returns of mutual funds to obtain the alphas and factor betas for the risk factor models. Specifically, we apply the following factor models:

$$\text{CAPM}: R_{p,t} = \alpha_p + \beta_p(R_{M.t} - r_{f,t}) + \varepsilon_{p,t},$$

$$\text{3FF}: R_{p,t} = \alpha_p + \beta_p(R_{M.t} - r_{f,t}) + \gamma_p SMB_t + \delta_p HML_t + \varepsilon_{p,t},$$

$$\text{4FF}: R_{p,t} = \alpha_p + \beta_p(R_{M.t} - r_{f,t}) + \gamma_p SMB_t + \delta_p HML_t + \theta_p MOM_t \varepsilon_{p,t},$$

$$\text{5FF}: R_{p,t} = \alpha_p + \beta_p(R_{M.t} - r_{f,t}) + \gamma_p SMB_t + \delta_p HML_t + \theta_p MOM_t + \rho_p PRF_t + \kappa_p INV_t + \varepsilon_{p,t}, \quad (1)$$

where $R_{p,t}$ is the monthly return of fund p in month t, and α_p, also known as the selectivity skill, is the alpha of the fund and is a proxy for performance that can be attributed to the skill of the manager after controlling for common risk factors. $R_{M.t} - r_{f,t}$ is the excess return on the market index, which is defined as the difference between the return on the market index, $R_{M.t}$, in month t and the risk-free rate, $r_{f,t}$, in month t. As a proxy for the risk-free rate, we use the 1-month Euro Overnight Index Average (EONIA) rate obtained from the European Central Bank. SMB_t and HML_t are the size and book-to-market factors, respectively, in Fama and French (1993); MOM_t is the momentum factor from Carhart (1997); and PRF_t and INV_t are the profitability and investment pattern factors, respectively, in Fama and French (2015). All the European risk factors are obtained from Kenneth French's website.[18] β_p, γ_p, δ_p, θ_p, ρ_p, and κ_p are the coefficients to be estimated. $\varepsilon_{p,t}$ is an error term.

Under the null hypothesis of no selectivity skill, the estimated coefficient for a fund's alpha should be statistically equal to zero. Table 3 presents the empirical results. We provide results for the whole sample as well as for the pairs of subgroups to provide a better understanding of the risk-adjusted performance differences between fund managers with different characteristics. These pairs of subgroups are defined in terms of gender (male, female), age (less than 46 years old, at least 46 years old), tenure (less than 9 years, at least 9 years), CFA (with, without), and MBA (with, without). For age and tenure, the integer closest to the median value is the cutoff point to split into two groups. For the different risk-adjusted models we use, the percentage of the estimated alphas that are statistically significant at the 95% level ranges from 19.84% to 36.81%. The average alphas for the whole sample are statistically significant for the CAPM, 3FF model, and 5FF model at the 5%, 10%, and 10% levels, respectively, but insignificant for the 4FF model. The average alphas for each subgroup usually are not significantly different from zero except for older managers (at least 46 years old), shorter tenured managers (less than 9 years), and managers with a CFA certification. These results indicate that regardless of gender, fund managers who have good risk-adjusted performance are older and have shorter tenures. In general, our results are in line with those of Fama and French (2010), Carhart (1997), Gruber (1996), Wermers (2000), Del Guercio and Reuter (2014), and Busse et al. (2010) who also present evidence that, on average, mutual funds fail to beat a set of benchmarks.

Table 4 presents the results of a two-tailed t-test of the differences between the sample means of each of the pairs of subgroups. Female-managed funds on average have a higher risk-adjusted alpha in all but the 5FF model. However, the alphas of female-managed funds are statistically significant less often than the alphas of male-managed funds. In any case the difference in the alphas between male- and female-managed funds is not statistically significant at the 10% level. For example, the p-value for the difference in the 3FF alphas is 0.426 and

[18] https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

TABLE 3 Monthly alphas.

	CAPM alpha	Beta	3FF alpha	4FF alpha	5FF alpha
All (383)					
Average alpha	0.025**	0.959	0.020*	0.013	0.019*
# significant alphas	141	—	117	96	76
Negative alphas	49	—	54	48	51
% significant alphas	36.81%	—	30.55%	25.07%	19.84%
Male (327)					
Average alpha	0.013	0.971	0.017	0.010	0.08
# significant alphas	87	—	81	52	47
Negative alphas	44	—	50	37	38
% significant alphas	27.61%	—	24.77%	15.90%	14.37%
Female (56)					
Average alpha	0.015	0.984	0.019	0.014	0.009
# significant alphas	14	—	13	9	6
Negative alphas	9	—	7	8	5
% significant alphas	25.00%	—	23.12%	16.07%	10.71%
Age < 46 (121)					
Average alpha	0.023	1.104	0.029*	−0.009	0.008
# significant alphas	31	—	30	23	22
Negative alphas	14	—	13	10	8
% significant alphas	25.62%	—	24.79%	19.01%	18.18%
Age ≥ 46 (125)					
Average alpha	0.041**	1.031	0.035**	0.028**	0.017
# significant alphas	44	—	37	35	22
Negative alphas	12	—	11	8	10
% significant alphas	35.20%	—	29.60%	28.00%	17.60%
Tenure < 9 (185)					
Average alpha	0.079***	0988	0.062***	0.055**	0.023*
# significant alphas	63	—	56	52	28
Negative alphas	18	—	26	19	15
% significant alphas	34.05%	—	30.27%	28.11%	15.14%
Tenure ≥ 9 (198)					
Average alpha	0.031**	1.133	0.012	−0.007	−0.005
# significant alphas	42	—	30	19	12
Negative alphas	15	—	16	11	7
% significant alphas	21.21%	—	15.15%	9.60%	6.06%

(Continues)

TABLE 3 (Continued)

	CAPM alpha	Beta	3FF alpha	4FF alpha	5FF alpha
CFA (46)					
Average alpha	0.082***	0.989	0.057***	0.034**	0.022*
# significant alphas	21	—	19	16	12
Negative alphas	3	—	2	2	3
% significant alphas	45.65%	—	41.30%	34.78	26.09%
No CFA (232)					
Average alpha	0.022	1.218	−0.0118	−0.000	0.009
# significant alphas	79	—	69	50	48
Negative alphas	28	—	27	17	11
% significant alphas	34.05%	—	29.74%	21.55%	20.69%
MBA (23)					
Average alpha	0.015	1.048	0.000	0.011	0.007
# significant alphas	8	—	7	9	3
Negative alphas	3	—	3	2	0
% significant alphas	34.78%	—	30.43%	39.13%	13.04%
No MBA (255)					
Average alpha	0.019*	0.960	0.008	−0.006	0.010
# significant alphas	68	—	66	61	45
Negative alphas	25	—	26	33	12
% significant alphas	26.67%	—	25.88%	23.92%	17.65%

Note: This table presents the average monthly alphas obtained by regressing the monthly fund returns on the capital asset pricing model (CAPM) that controls for market risk, the Fama–French (1993) three-factor (3FF) model that also controls for size and book-to-market, the Carhart (1997) four-factor (4FF) model that also controls for momentum, and the Fama–French (2015) five-factor (5FF) model that also controls for profitability and investment patterns (5FF). The beta coefficient reported in the table is obtained from the CAPM. The pairs of subgroups are defined in terms of gender (male, female), age (less than 46 years, more than 46 years), tenure (less than 9 years, greater than or equal to 9 years), CFA certification (has a chartered financial analyst [CFA] certification, does not have a CFA certification), and MBA qualification (i.e., has a master of business administration [MBA], does not have an MBA). For age and tenure, the integer closest to the median value was chosen as a cutoff for the split into two groups. As a proxy for the risk-free rate, we use the 1-month Euro Overnight Index Average (EONIA) rate obtained from the European Central Bank. As a proxy of the market return, we use the monthly return of the MSCI Europe index. The number of funds used in the estimation is given in parentheses. In all regressions we use Newey and West's (1987) corrected standard errors. All European risk factors are obtained from Kenneth French's website (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). All fund data come from Morningstar and cover January 2005 to December 2020.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

indicates a nonsignificant difference in the monthly alpha of about 0.002 that favors female over male managers. Additionally, there is no statistically significant difference between male and female managers in terms of systematic risk, with female-managed funds having only marginally higher betas.

When we examine the difference in risk-adjusted alphas of young and old managers, the results indicate that older managers have somewhat better performance than younger managers. For example, the difference in the

TABLE 4 Differences in sample means of estimated monthly alphas between different subgroups.

	CAPM alpha	Beta	3FF alpha	4FF alpha	5FF alpha
Gender difference (male – female)	−0.002	−0.013	−0.002	−0.004	0.071
	(0.478)	(0.316)	(0.426)	(0.355)	(0.209)
Age difference (young – old)	−0.018	0.073	−0.006	−0.037	−0.009
	(0.082)	(0.040)	(0.066)	(0.003)	(0.095)
Tenure difference (short – long)	0.048	−0.145	0.050	0.062	0.028
	(0.048)	(0.032)	(0.043)	(0.044)	(0.029)
CFA difference (CFA holder – non-CFA holder)	0.006	−0.229	0.068	0.034	0.013
	(0.088)	(0.041)	(0.095)	(0.061)	(0.089)
MBA difference (MBA holder – non-MBA holder)	−0.004	0.088	−0.008	0.017	−0.003
	(0.167)	(0.333)	(0.262)	(0.418)	(0.319)

Note: This table presents the differences between the sample means of the estimated monthly alphas between the different managerial groups. The alphas are obtained by regressing the monthly fund returns on the capital asset pricing model (CAPM) that controls for market risk, the Fama–French (1993) three-factor (3FF) model that also controls for size and book-to-market, the Carhart (1997) four-factor (4FF) model that also controls for momentum, and the Fama–French (2015) five-factor (5FF) model that also controls for profitability and investment patterns (5FF). Young managers are younger than 46 years old and old managers are at least 46 years old. Short tenures are less than 9 years and long tenures are at least 9 years. The *p*-values of the two-tailed *t*-test that the sample alphas are equal, which assumes unequal variances, are given in parentheses. All European risk factors are obtained from Kenneth French's website (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). All fund data come from Morningstar and cover January 2005 to December 2020.

CAPM alphas of young and old managers is a monthly −0.018%, which is statistically significant at the 10% level. This better risk-adjusted performance of older managers also comes with lower systematic risk. Indeed, the betas of fund portfolios managed by older managers are 0.073 lower than the betas of the portfolios managed by young managers. This difference is also statistically significant at the 5% level. The results related to the 3FF, 4FF, and 5FF alphas confirm our findings. Furthermore, the results indicate that longer tenured managers tend to perform worse than shorter tenured managers. For example, shorter tenured managers generate a higher 3FF alpha than longer tenured managers of 0.50%, which is statistically significant at the 5% level. Moreover, this higher alpha comes with lower exposure to systematic risk. CFA holders also generate higher risk-adjusted alphas, which also come with lower systematic risk. The difference in CAPM alphas of mutual fund portfolios managed by CFA holders and non-CFA holders is 0.006% and is statistically significant at the 10% level. The results from the other models follow the same pattern. Furthermore, there is no difference in the risk-adjusted alphas of fund portfolios managed by managers with an MBA and portfolios managed by managers without an MBA.

3.2 | Relation between managerial characteristics and excess fund performance

We follow Chevalier and Ellison (1999a) and estimate simple regressions to examine whether the excess return of the mutual fund in month $t + 1$ is related to the characteristics of the manager who oversees the fund in month t. Specifically, we estimate the following model:

$$ExcessReturn_{p,t+1} = c + \pi \times V_{p,t} + \theta \times Z_{p,t} + \varepsilon_{p,t}, \quad (2)$$

where $ExcessReturn_{p,t+1}$ is the excess monthly return of mutual fund p, which is defined as the difference between the return on fund p, $R_{p,t+1}$, in month $t + 1$ and the return on the fund's primary benchmark, $R_{B,t+1}$, in month $t + 1$; c is

a constant term; $V_{p,t}$ is the vector of managerial characteristics; $Z_{p,t}$ is the vector of control variables (i.e., fund characteristics); π and θ are the vectors of coefficients to be estimated; and $\varepsilon_{p,t}$ is an error term.[19] The vector of managerial characteristics comprises the following variables: Age_p and $Tenure_p$, which are the age and tenure of the manager for fund p, respectively, and $Gender_p$, MBA_p, and CFA_p, which are binary variables for fund p that equal 1 for women and 0 for men, 1 for with an MBA and 0 without, and 1 for with a CFA and 0 without, respectively.

We divide these characteristics into several groups and report in Table 5 the regression results estimated using Newey and West's (1987) corrected standard errors. The first group comprises age and tenure (Column 1); the second group comprises age, tenure, and gender (Column 2); the third group comprises CFA and MBA (Column 3), the fourth group comprises gender, CFA, and MBA (Column 4), and the fifth group comprises all managerial characteristics (Column 5). In all groups, we also include control variables that the literature suggests may be significantly related to fund performance (e.g., Chen et al., 2004; Ferreira et al., 2012). Specifically, the vector of control variables (i.e., fund characteristics) consists of the following: $Size_p$, which is the log of the monthly total net assets (TNA) of fund p in millions of euros; $Family\ size_p$, which, similar to Chen et al. (2004), is defined as the log of 1 plus the cumulative TNA of the other funds in the family to which the fund belongs (excluding the TNA of the fund itself)[20]; $Fund\ age_p$, which is the time in years since the start of fund p; Fee_p, which is the percentage of fund p's monthly net assets paid to its manager; and $Turnover_p$, which is the percentage of fund p's portfolio holdings that have changed over the past year. To ease the interpretation of the estimated coefficients, we standardize all nondummy variables to have a mean of 0 and standard deviation of 1.

An examination of all specification models (Columns 1–5 in Table 5) shows that age and tenure have a significant positive and a negative relation, respectively, with the excess returns. A 10-year increase in the manager's age is predicted to generate a 1.24% larger excess return per annum, but a 10-year increase in managerial tenure is expected to lead to a 0.61% smaller excess return per annum. These results contrast with Chevalier and Ellison (1999a) who find that older managers generate smaller returns than their younger counterparts.[21] Their results may be different from ours for several reasons. First, as Chevalier and Ellison (1999a) discuss, the larger returns generated by younger managers may be largely the result of younger managers working for funds that have lower management fees and other expenses. Given that Chevalier and Ellison (1999a) use net returns and not gross returns, as in our study, the effect of lower fees on the performance of younger managers in their study is smaller compared to the effect of higher fees on the performance of older managers, which leads to the relatively better performance of younger managers compared to their older counterparts. In our study, however, we use gross returns and therefore the levels of fees and other expenses do not have an effect on fund performance. Second, US funds tend to have more hierarchies compared to EU funds that result in additional costs that reduce fund performance (Aghion & Tirole, 1997; Ferreira et al., 2012; Stein, 2002). The effect of this reduction is likely to be larger for older managers in US funds because they are more likely to work for larger funds with more complex structures and hierarchies compared to their younger counterparts. Thus, the performance of older managers in US funds relative to younger managers is likely to be worse compared to the performance of their counterparts in EU funds.

In relation to tenure, Chevalier and Ellison (1999b) report a slight increase in performance due to tenure, but this effect is not statistically significant. Another possible explanation for the contrasting results between our study and Chevalier and Ellison (1999b) is differences in the sample construction. These can include differences in the

[19] As the primary benchmarks of the funds, we use those reported by Morningstar rather than the benchmarks stated by the funds in their brochure. This is to avoid the cherry-picking bias (e.g., Harvey et al., 2021).

[20] Similar to Chen et al. (2004), we also consider the effect that family size may have on fund performance. Chen et al. (2004) find that the size of the other funds in the family that the fund belongs to, increases the fund's performance. Although the effect is smaller than that of the fund size, it is statistically and economically significant. Chen et al. (2004) attribute this finding to economies related to trading commissions and lending fees at the family level. In our study, it is important to control for family size because fund and family size are positively correlated. Specifically, because family size is good for performance, it is important to control for it to identify the potential effect of fund size on performance.

[21] For example, Chevalier and Ellison (1999a) find that a manager 12 years older than the mean generates a 1% lower return per annum than the mean manager.

TABLE 5 Relation between excess monthly returns and managerial characteristics.

	(1)	(2)	(3)	(4)	(5)
Constant	0.202**	0.298**	0.366***	0.244***	0.121**
Age	0.018**	0.027***			0.022**
Tenure	−0.012*	−0.016*			−0.015*
Gender		−0.007		−0.009	0.001
CFA			0.092**	0.060*	0.077**
MBA			0.019	0.011	0.008
Size	0.099**	0.086**	0.043*	0.032*	0.019*
Family size	0.002	0.001	0.000	0.004	0.001
Fund age	0.026*	0.031**	0.031*	0.047*	0.005
Fee	0.012	0.022	0.016*	0.015*	0.009
Turnover	0.120***	0.117**	0.191***	0.096*	0.035**
Adj. R^2	0.29	0.30	0.11	0.13	0.33
Obs.	482	482	653	509	471

Note: This table presents the coefficient estimates for the regressions of the funds' excess returns in month $t + 1$ on the characteristics of managers who are in charge of the funds in month t, for different specification models. *Gender* is a dummy variable that equals 1 if the fund manager is female, and 0 if the fund manager is male. *MBA* is a dummy variable that equals 1 if the fund manager has a master of business administration (MBA) and 0 if the fund manager does not have an MBA. *CFA* is a dummy variable that equals 1 if the fund manager has a chartered financial analyst (CFA) certification and 0 if the fund manager does not have a CFA certification. In our regression analysis we control for the characteristics that affect the performance of the funds: *Size* is the logarithm of the monthly total net assets of the fund in millions of euros, *Family size* is the log of 1 plus the cumulative total net assets (TNA) of the other funds in the family to which the fund belongs (excluding the TNA of the fund itself), *Fund age* is the time in years since the start of the fund, *Fee* is the percentage of the fund's monthly net assets paid to its manager, and *Turnover* is the percentage of the fund portfolio's holdings that have changed over the past year. In all regressions we use Newey and West's (1987) corrected standard errors. All fund data come from Morningstar and cover January 2005 to December 2020.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

investment style (i.e., growth and growth and income in Chevalier & Ellison vs. a wider variety of investment styles in our study), the period covered (1988–1994 in Chevalier & Ellison vs. 2005–2020 in our study), and the number of funds in the sample (i.e., 492 in Chevalier & Ellison vs. 383 in our study). There is also strong evidence that managers with a CFA perform better than those without a CFA. Indeed, managers with a CFA generate an additional excess return of 2.35% per annum. Shukla and Singh (1994) and Switzer and Huang (2007) report similar results. Furthermore, gender remains statistically insignificant across all models, whereas there is no evidence that managers with an MBA do better than those without an MBA. These results contrast those of Niessen-Ruenzi and Ruenzi (2019) who find that female fund managers receive lower inflows and therefore tend to achieve lower returns than male fund managers, and Chevalier and Ellison (1999a), Gottesman and Morey (2006), and Golec (1996) who find that fund managers holding an MBA from a highly ranked institution have superior performance compared to those without an MBA. Therefore, these results indicate that in mutual funds domiciled in the eurozone, male managers and those with an MBA do not necessarily have higher human capital than female managers with or without an MBA.

As for our control variables, most have the expected signs although not all are statistically significant. A notable exception is fund size, which has a significant positive relation with EU fund performance. This finding is different

from Chen et al. (2004) who find that the performance of US funds is negatively related to their size. However, our finding is in line with Ferreira et al. (2012) who present strong evidence that this is not true for the rest of the world, including European mutual funds.[22] Furthermore, our results indicate that family size has a positive but small and statistically insignificant effect on fund performance. At first glance, this seems to be a paradox because fund and family size are positively correlated. However, in most fund families, decisions are decentralized, and fund managers can make independent decisions in relation to their portfolios' allocation. Thus, fund performance may be different from that of other funds in the same family.

3.3 | Relation between managerial characteristics and risk-adjusted fund performance

In this subsection, we examine the relation between the fund risk-adjusted return in month $t+1$ and the characteristics of the manager in charge of the fund in month t. As proxies for a fund's performance, we use the alphas obtained from the CAPM, 3FF model, 4FF model, and 5FF model. Specifically, we estimate the Fama–MacBeth (1973) cross-sectional regressions of the form:

$$Alpha_{p,t+1} = c + \kappa \times V_{p,t} + \omega \times + \varepsilon_{p,t}, \tag{3}$$

where $Alpha_{p,t+1}$ is the alpha for fund p in month $t+1$ obtained from the four risk-adjusted models we assume in Equation (1), c is a constant term, $V_{p,t}$ is the vector of managerial characteristics, $Z_{p,t}$ is the vector of control variables, κ and ω are the vectors of coefficients to be estimated, and $\varepsilon_{p,t}$ is an error term. The vector of managerial characteristics comprises the following variables: Age_p, $Tenure_p$, $Gender_p$, MBA_p, and CFA_p (defined in Equation 2). The vector of control variables (i.e., fund characteristics) comprises the following variables: $Size_p$, $Family\ size_p$, $Fund\ age_p$, Fee_p, and $Turnover_p$ (defined in Equation 2). We divide these characteristics into several groups and report in Table 6 the regression results estimated using Newey and West's (1987) corrected standard errors. The first group comprises age and tenure (Column 1); the second group comprises age, tenure, and gender (Column 2); the third group comprises CFA and MBA (Column 3); the fourth group comprises gender, CFA, and MBA (Column 4); and the fifth group comprises all managerial characteristics (Column 5). To ease the interpretation of the estimated coefficients, we cross-sectionally standardize all nondummy variables to have a mean of 0 and a standard deviation of 1.

The age and tenure coefficients are positive and negative, respectively, and statistically significant across most model specifications and asset pricing models. Gender remains a statistically insignificant predictor. The previously identified statistically significant effects of a CFA certification remain statistically significant across all pricing models. Similarly, the effect of an MBA remains statistically insignificant. In general, our results indicate that with the exception of age, tenure, and CFA certification, the other main managerial characteristics do not have a statistically significant effect on the risk-adjusted performance of funds. To a large extent, our results are in line with those reported in the literature on the performance of US mutual funds (e.g., Golec, 1996; Shukla & Singh, 1994).

3.4 | Relation between managerial characteristics and risk taking

In this subsection, we examine the relation between the risk taking of fund portfolios in month $t+1$ and the characteristics of the managers in charge of the funds in month t. For that reason, we use the Fama–MacBeth (1973)

[22]Ferreira et al. (2012) find that small funds perform better than large funds only for US funds, but this is not true for the rest of the world, including European mutual funds. They also report that the negative size effect in US funds is economically significant as a one standard deviation increase in fund size yields a 15 bps decline in the next quarter's fund net return, whereas in Europe it yields 11 bps in next quarter's net fund return.

TABLE 6 Relation between risk-adjusted performance and managerial characteristics.

	(1)	(2)	(3)	(4)	(5)
Panel A: CAPM alpha					
Constant	0.094**	0.122**	0.208***	0.066*	0.093**
Age	0.040**	0.066**			0.094**
Tenure	−0.023*	−0.025*			−0.044*
Gender		0.004		0.022*	0.010
CFA			0.111**	0.018	0.133**
MBA			0.010	0.011	0.006
Size	0.088*	0.076**	0.040*	0.034*	0.023**
Family size	0.004	0.003	0.002	0.001	0.000
Fund age	0.020*	0.028**	0.019*	0.018*	−0.001
Fee	0.031*	0.009	0.012*	0.006	0.016*
Turnover	0.200***	0.081**	0.180***	0.106**	0.041*
Adj. R^2	0.26	0.26	0.23	0.22	0.25
Obs.	482	482	653	509	471
Panel B: 3FF alpha					
Constant	0.105**	−0.052*	0.078*	0.185***	0.112**
Age	0.070**	0.049*			0.046*
Tenure	−0.046**	−0.032*			−0.039**
Gender		0.010		0.063*	0.006
CFA			0.156**	0.011	0.073**
MBA			0.015*	−0.018	0.020
Size	0.073**	0.029	0.100**	0.047**	0.088**
Family size	0.003	0.004	0.001	0.002	0.005
Fund age	0.049**	0.024*	0.018	0.011	0.008
Fee	0.016	0.009	0.011	0.011	0.011
Turnover	0.129***	0.189***	0.203***	0.109***	0.182***
Adj. R^2	0.21	0.19	0.26	0.20	0.19
Obs.	482	482	653	509	471
Panel C: 4FF alpha					
Constant	0.112**	0.087**	0.042*	0.069	0.105**
Age	0.252***	0.123***			0.081**
Tenure	−0.098**	−0.103**			−0.055**
Gender		0.004		0.017*	0.010
CFA			0.123**	0.057*	0.111**

(Continues)

TABLE 6 (Continued)

	(1)	(2)	(3)	(4)	(5)
MBA			0.018	−0.005	0.013
Size	−0.040*	0.203***	0.111**	0.088**	0.045*
Family size	0.000	0.005	0.000	0.001	0.003
Fund age	0.014*	0.014*	0.025*	0.011	0.021*
Fee	0.010	0.012	0.018*	0.005	0.014
Turnover	0.222***	0.209***	0.166**	0.207***	0.171***
Adj. R^2	0.18	0.22	0.20	0.15	0.28
Obs.	482	482	653	509	471
Panel D: 5FF alpha					
Constant	0.029	0.104**	0.401**	−0.039**	0.236***
Age	0.013	0.053*			0.059**
Tenure	−0.022*	−0.037**			−0.018*
Gender		0.009		0.003	0.017*
CFA			0.182***	0.077**	0.031*
MBA			0.029*	−0.010	−0.007
Size	0.142***	0.048*	0.180***	0.178**	0.070**
Family size	0.015*	0.002	0.004	0.004	0.003
Fund age	0.023*	0.055*	0.091**	0.081**	0.100**
Fee	0.019*	0.022*	0.012	0.011	0.011
Turnover	0.178***	0.102***	0.066**	0.108**	0.051*
Adj. R^2	0.30	0.23	0.19	0.22	0.28
Obs.	482	482	653	509	471

Note: This table presents the coefficient estimates for the Fama–MacBeth (1973) cross-sectional regressions of the risk-adjusted performance in month $t + 1$ of the mutual funds on the characteristics of the managers who are in charge of the funds in month t for different specification models. As a proxy for a fund's performance, we use the alphas obtained from the single-factor capital asset pricing model (CAPM) (Panel A), the three-factor Fama–French (1993) model (3FF) (Panel B), the four-factor Carhart (1997) model (4FF) (Panel C), and the five-factor Fama–French (2015) model (5FF) (Panel D). See Table 5 for variable definitions. To ease interpretation of the estimated coefficients, we cross-sectionally standardize all nondummy variables to have a mean of 0 and a standard deviation of 1. In all regressions we use Newey and West's (1987) corrected standard errors with three lags. All European risk factors are obtained from Kenneth French's website (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). All fund data come from Morningstar and cover January 2005 to December 2020.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

cross-sectional regressions of systematic risk, unsystematic risk, and total risk on managerial characteristics. Specifically, we estimate the following regression model:

$$Risk_{p,t+1} = c + \lambda \times V_{p,t} + \mu \times Z_{p,t} + \varepsilon_{p,t}, \quad (4)$$

where $Risk_{p,t+1}$ is the systematic, unsystematic, or total risk measure for fund p in month $t + 1$. As a measure of systematic risk for a fund, we follow Chevalier and Ellison (1999b) and use its CAPM beta. As a measure of

TABLE 7 Relation between risk taking and managerial characteristics.

	(1)	(2)	(3)	(4)	(5)
Panel A: Systematic risk					
Constant	0.451***	0.189***	0.366***	0.203***	0.307***
Age	0.009*	0.020**			0.015**
Tenure	−0.008*	−0.019*			−0.020*
Gender		0.000		0.003	−0.001
CFA			−0.004*	−0.004*	−0.010*
MBA			0.001	0.000	0.001
Size	−0.054**	−0.031*	−0.021*	−0.050**	−0.044*
Family size	0.001	0.001	0.003	0.003	0.002
Fund age	0.011	0.020*	0.012	0.009	0.002
Fee	0.002	0.010	0.021	0.007	0.003
Turnover	0.036**	0.042**	0.109***	0.038*	0.026*
Adj. R^2	0.16	0.20	0.15	0.24	0.26
Obs.	471	482	482	653	471
Panel B: Unsystematic risk					
Constant	0.721***	0.783***	0.802***	0.452***	0.303***
Age	0.061**	0.111***			0.098**
Tenure	−0.035*	−0.026*			−0.032*
Gender		0.002		−0.012*	0.001
CFA			−0.017*	0.004	0.001
MBA			0.003	0.010*	0.003
Size	−0.147**	−0.027*	−0.052*	−0.095**	−0.159***
Family size	0.002	0.002	0.002	0.003	0.003
Fund age	0.022*	0.021*	0.014	−0.008	−0.011
Fee	0.031	0.019	0.015	0.009	0.011
Turnover	0.070**	0.104***	0.155**	0.083**	0.055**
Adj. R^2	0.12	0.18	0.11	0.20	0.25
Obs.	471	482	482	653	471
Panel C: Total risk					
Constant	0.772***	0.621***	0.527***	0.482***	0.423***
Age	0.105**	0.121**			0.189**
Tenure	−0.035**	−0.040*			−0.021*
Gender		0.007		−0.000	0.002
CFA			0.004	0.007	0.003

(Continues)

TABLE 7 (Continued)

	(1)	(2)	(3)	(4)	(5)
MBA			0.002	−0.001	0.002
Size	−0.080**	−0.222***	−0.090**	−0.055**	−0.096**
Family size	0.003	0.004	0.002	0.003	0.004
Fund age	0.002	0.019*	0.010*	0.005	0.010*
Fee	0.006	0.009	0.009	0.011*	0.004
Turnover	0.155**	0.107**	0.099**	0.087***	0.114**
Adj. R^2	0.13	0.17	0.16	0.22	0.22
Obs.	471	482	482	653	471

Note: This table presents the coefficient estimates from the Fama–MacBeth (1973) cross-sectional regressions of the funds' risk taking in time $t + 1$ on the characteristics of the managers in charge of the funds in month t for different specification models. Risk is either the systematic, unsystematic, or total risk measure for fund p in month $t + 1$. As a measure of systematic risk for a fund, we follow Chevallier and Ellison (1999b) and use its beta derived by the capital asset pricing model (CAPM); as a measure of unsystematic risk, we use the square root of the estimated residual variance in the CAPM regression; and as a measure of total risk, we use the standard deviation of its monthly returns. See Table 5 for all variable definitions. To ease the interpretation of the estimated coefficients, we cross-sectionally standardize all nondummy variables to have a mean of 0 and a standard deviation of 1. In all regressions we use Newey and West's (1987) corrected standard errors with three lags. All fund data come from Morningstar and cover January 2005 to December 2020.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

unsystematic risk, we use the square root of the estimated residual variance in the CAPM regression. As a measure of total risk, we use the standard deviation of its monthly returns. c is a constant term, $V_{p,t}$ is the vector of managerial characteristics, $Z_{p,t}$ is the vector of control variables, λ and μ are the vectors of coefficients to be estimated, and $\varepsilon_{p,t}$ is an error term. The vector of managerial characteristics comprises the following variables: Age_p, $Tenure_p$, $Gender_p$, MBA_p, and CFA_p (defined in Equation 2). The vector of control variables (i.e., fund characteristics) comprises the following variables: $Size_p$, $Family\ size_p$, $Fund\ age_p$, Fee_p, and $Turnover_p$ (defined in Equation 2). Table 7 presents the regression coefficients estimated with Newey and West's (1987) corrected standard errors for systematic risk (Panel A), unsystematic risk (Panel B), and total risk (Panel C). The characteristics are divided into several groups as in Tables 5 and 6. To ease the interpretation of the estimated coefficients, we cross-sectionally standardize all nondummy variables to have a mean of 0 and a standard deviation of 1.

When we examine the relation between systematic risk and managerial characteristics, age has a positive and statistically significant effect on risk taking across all model specifications. This significance indicates that younger managers are more reluctant to take on systematic risk relative to older managers. This reluctance may be because managerial separation is more sensitive for younger managers, and therefore they have an incentive to be more risk averse than older managers (Chevallier & Ellison, 1999a, 1999b). The full specification model (Model 5), for example, predicts that a 1 *SD* decrease in age results in a 0.118 decrease in the fund beta. In fact, the difference in betas between the youngest (31 years old) and oldest (73 years old) managers in our sample in Model 5 is 0.134, which is large in terms of systematic risk. Tenure is also statistically significant in all model specifications where it is included, and its sign is consistently negative across all of them. According to the full specification model (i.e., Model 5), a 1 *SD* decrease in tenure predicts an additional beta of 0.062. The longest tenured manager in the sample has a tenure of 32.71 years and the shortest tenured manager has a tenure of 5.04 years. The difference in the fund beta between them is predicted to be 0.298 (Model 5).

These results are, in general, in line with Chevalier and Ellison (1999a, 1999b) and Golec (1996). The results are similar when we consider unsystematic risk and total risk. Overall, younger managers with longer tenure at their

funds have a tendency to take on less systematic, unsystematic, and total risk compared to their older counterparts. Furthermore, the estimated CFA and MBA coefficients are not statistically significant in all models and types of risk considered. In summary, the differences in risk taking are not significantly related to most managerial characteristics except for age and tenure, with the former positively and the latter negatively related to risk taking.

4 | CONCLUSION

We use a sample of 383 diversified equity mutual funds domiciled in the eurozone to examine the relation between fund performance and risk taking and observable managerial characteristics that include: managers' age, tenure, gender, advanced education (i.e., MBA), and professional qualifications (i.e., CFA). In our analysis, we account for common risk factors such as market risk (i.e., beta), Fama–French (1993) size and book-to-value factors, Carhart (1997) momentum factor, and Fama–French (2015) profitability and investment pattern factors. We also control for fund characteristics that have been shown to have an effect on performance (i.e., size, family size, fund age, management fee, and turnover).

Our preliminary analysis indicates that the average alphas for the whole sample are statistically significant for the CAPM, 3FF model, and 5FF model at the 5%, 10%, and 10% levels, respectively, but insignificant for the 4FF model. The average alphas for the subgroups of older managers, shorter tenured managers, and managers with a CFA certification are significantly different from zero. In general, the results indicate that regardless of gender, older managers with short tenures have better risk-adjusted performance than younger managers with longer tenures. We also find that female-managed funds, on average, have higher risk-adjusted alphas than male-managed funds in all but the 5FF model; however, the difference is not statistically significant at the 10% level. Furthermore, we detect no statistically significant difference in the alphas of fund portfolios managed by managers who hold an MBA and those who do not.

Regressions of the monthly excess returns of mutual funds on managerial characteristics show that age, tenure, and CFA certification have a statistically significant effect on excess returns, but this is not the case for gender and MBA. Specifically, older managers with shorter tenures perform better than younger managers and managers with longer tenures. The results are robust even after controlling for fund size, family size, fund age, management fee, and turnover. The estimates from Fama–MacBeth (1973) cross-sectional regressions of the alphas obtained from the CAPM, 3FF model, 4FF model, and 5FF model on managerial characteristics indicate that age and CFA certification are positively and significantly related to the fund's risk-adjusted performance, and tenure is negatively and significantly to the fund's risk-adjusted performance. However, gender and MBA are statistically insignificant for all model specifications. We also examine the relation between managerial characteristics and fund risk taking. We find that differences in risk taking (systematic, unsystematic, and total risks) are statistically significant only for age and tenure, which have a negative and a positive relation to risk taking, respectively.

Our article contributes to the literature on mutual fund performance because it is one of the few with a focus on the eurozone equity mutual funds instead of US funds, which is typical in the literature. We also use a more recent data set with a clear attribution of fund performance and present results that may have important implications for investors when selecting a fund.

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