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Février 2004

**NER # 107**

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DIRECTION GÉNÉRALE DES ÉTUDES ET DES RELATIONS INTERNATIONALES

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# The Bank Bias: Segmentation of French Fund Families

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**Résumé :**

Dans ce papier, nous analysons la relation performance-croissance des OPCVM français. A l'aide de techniques de panel, nous trouvons que les entrées de capitaux dans les fonds français les plus performants ne sont pas aussi fortes que prévues. Ce résultat suggère qu'il existe des barrières à l'investissement, qui pourraient provenir du fait que les fonds sont principalement gérés par les banques et les compagnies d'assurance et qu'il existe des coûts élevés pour un investisseur de transférer des fonds d'une institution à une autre. Nous appelons ce phénomène "bank bias", car les investisseurs ne diversifient pas suffisamment leur portefeuille entre les OPCVM proposés par les banques. De plus, nous proposons un test de cette hypothèse, que nous ne pouvons pas rejeter.

**Mots-clés :** OPCVM, Performance, SICAV, FCP.
**JEL classification:** G12, G20, G23.

**Abstract:**

In this paper, we investigate the performance-growth relation of French mutual funds. Using panel techniques, we find that capital inflows to French past top performing funds are not as strong as expected. This result suggests that there exist barriers to investment, that may come from the fact that funds are mostly managed by banks and insurance companies and that there are high switching costs for an investor to transfer cash from one financial institution to another. We call this phenomenon "bank bias", because investors do not diversify enough across banks' funds. Furthermore, we provide a test of our conjecture and cannot reject it.

**Keywords:** Mutual funds, Performance, SICAV, FCP.
**JEL classification:** G12, G20, G23.

**Résumé non technique :**

Dans ce papier, nous étudions si les investisseurs dans les fonds d'investissement (OPCVM) français sont des "usagers" passifs ou des "clients" actifs, prêts à déplacer leurs capitaux après de mauvaises performances d'un fonds. A cette fin, nous testons, selon différentes perspectives, la relation entre la performance d'un fonds et la croissance de son capital. D'un point de vue économique, nous nous interrogeons si les fonds qui ont connu de récentes mauvaises performances sont sanctionnés par le marché. Il s'agit d'un problème important, puisque les OPCVM sont susceptibles de jouer un rôle important dans les transferts de richesse intertemporels liés aux retraites.

Cette étude porte sur des données françaises. Nous suivons deux directions complémentaires. Tout d'abord, nous examinons l'influence des performances passées et de l'âge sur le taux de croissance du fonds. Pour des fonds américains, la relation performance-croissance est non-linéaire, suggérant que les investisseurs réagissent plus aux mauvaises performances des jeunes fonds qu'à de mauvaises performances similaires des vieux fonds. Nous montrons que les fonds qui connaissent de mauvaises performances ont une croissance qui est moins sensible à la performance passée. Nous trouvons également que les fonds aux performances moyennes et bonnes ont des sensibilités très proches par rapport à la performance passée. Ce résultat suggère que ce n'est pas parce qu'un fonds a connu de très bonnes performances passées qu'il est susceptible d'attirer plus de capitaux. Cela implique en outre qu'il existe, d'une certaine façon, des barrières à l'investissement. Nous supposons que ces barrières proviennent du fait que les fonds sont principalement gérés par des banques et des compagnies d'assurance et qu'il existe des coûts élevés pour un investisseur de transférer des capitaux d'une institution à une autre. Nous appelons ce phénomène "bank bias", par analogie avec le "home bias". Alors que le "home bias" indique que les investisseurs ne diversifient pas suffisamment leur portefeuille internationallement, le "bank bias" signifie que les investisseurs ne diversifient pas suffisamment leur portefeuille entre les fonds d'investissement des banques.

D'autre part, nous mettons en évidence que les performances passées d'une famille de fonds dans son ensemble n'a pas d'impact sur son taux de croissance futur. En revanche, le rang de la performance d'un fonds à l'intérieur d'une famille de fonds possède un pouvoir explicatif significatif pour le taux de croissance de ce fonds. Ces résultats suggèrent que les investisseurs tendent à investir dans des familles de fonds de façon relativement mécanique et que les banques et les compagnies d'assurance françaises, qui gèrent les OPCVM, sont capables de retenir les capitaux des investisseurs du fait de coûts de transferts élevés. Une explication possible du fait que les banques créent des fonds nouveaux peut résider dans leur volonté de fournir aux clients plusieurs véhicules d'investissement au cas où ils seraient mécontents de l'un d'eux.

**Non-technical summary:**

In this paper, we address the issue whether investors in French mutual funds are passive "users" or active "clients" who shift their funds subsequent to bad performance. For this purpose, we test, from various perspectives, the relationship between mutual fund performance and growth. From an economic viewpoint, we investigate whether funds which had recent bad performances get disciplined by the market. This is an important issue, since mutual funds are likely to play an increasingly important role for retirement-related intertemporal wealth transfers.

We focus in this study on French data. We follow two complementary directions. First, we examine the influence of past performance and of age on the growth rate of funds. On US mutual-fund data, the performance-growth relation has been found to be non-linear, suggesting that investors react more to bad performance of young funds than to equally bad performance of old funds. We show that funds that performed badly have a lower sensitivity of growth with respect to performance. We also provide evidence that average and top performers have very similar sensitivities with respect to performance. This finding means that it is not because a fund has an excellent performance that it will attract more cash. This in turn implies that, somehow, there exist barriers to investment. We conjecture that these barriers come from the fact that funds are mostly managed by banks and insurance companies and that there are high switching costs for an investor to transfer cash from one financial institution to another. We call this phenomenon "bank bias", in analogy with the "home bias". Whereas, in the home bias, investors do not diversify enough internationally, in the bank bias, investors do not diversify enough across banks' funds.

In addition, we provide evidence that past performance of a fund family, as a whole, has no impact on its future growth rate. In contrast, the rank of the performance of a fund within a fund family has significant explanatory power to explain the growth rate of this fund. These results suggest that investors tend to invest in fund families in a rather mechanical way and that French banks and insurance companies, which are the managers of mutual funds, are able to retain the wealth of customers because of high switching costs. One possible reason why banks create new funds could reside in their wishing to provide their customers with several investment vehicles in case they are dissatisfied with a given one.

# 1 Introduction

The aim of this paper is to investigate whether investors in French mutual funds are passive "users" or active "clients" who shift their funds subsequent to bad performance. For this purpose, we test, from various perspectives, the relationship between mutual fund performance and growth. From an economic viewpoint, we address the issue whether funds which had recent bad performances get disciplined by the market. This is an important issue, since mutual funds are likely to play an increasingly important role for retirement-related intertemporal wealth transfers.

Hence, we would like to contribute to the relatively small, yet growing, literature investigating various aspects of European mutual funds. So far, this literature focuses mainly on the performance and possible persistence thereof. For instance, McDonald (1973), Dermine and Röller (1992), as well as Otten and Bams (2002) focus on French mutual funds. Other studies pertaining to European mutual fund performance are by Wittrock and Steiner (1995), Blake and Timmermann (1998), Grünbichler and Pleschiutschnig (1999), Ter Horst, Nijman, and De Roon (1998), Dahlquist, Engström, and Söderlind (2000). Whilst all these studies consider performance measurement, our study investigates the determinants of capital flows to mutual funds. This line of research goes back to earlier studies, involving exclusively US data, by Ippolito (1992), Patel, Hendricks, and Zeckhauser (1994), Rockinger (1996), Chevalier and Ellison (1997), Sirri and Tufano (1998), and Zheng (1999). An early study is by Spitz (1970).

We focus in this study on French data.[1] The main thrust of our research is the investigation of the performance-growth relation, following two complementary directions. First, we examine the influence of past performance and of age on the growth rate of funds. This type of research follows, thus, the one of Sirri and Tufano (1998), who investigate the performance-growth relation and associated non-linearities. It is also in line with Chevalier and Ellison (1997), who document, using US mutual-fund data, that the performance-growth relation is non-linear and that investors react more to bad performance of young funds than to equally bad performance of old funds.

We show that funds that performed badly have a lower sensitivity of growth with respect to performance. We also provide evidence that average and top performers have very similar sensitivities with respect to performance. This finding means that it is not because a fund has an excellent performance that it will attract more cash. This in turn implies that, somehow, there exist barriers to investment. We conjecture that these barriers come from the fact that funds are mostly managed by banks and insurance

[1] An alternative would have been an investigation of many European countries. We decided, however, to consider only one country because we believe that this will allow us to deal with more details certain questions. France has also the second largest mutual fund industry in the world.

companies and that there are high switching costs for an investor to transfer cash from one financial institution to another. We call this phenomenon "bank bias", in analogy with the "home bias", highlighted, for instance, by Lewis (1998). Whereas, in the home bias, investors do not diversify enough internationally, in the bank bias, investors do not diversify enough across banks' funds.

In addition, we provide evidence that past performance of a fund family, as a whole, has no impact on its future growth rate. This result suggests that investors tend to invest in fund families in a rather mechanical way. For instance, as their wage revenue keeps flowing to their bank account, they purchase mutual funds from their bank rather than a potentially better one from another bank. To further corroborate our thesis that French mutual fund industry is rather segmented, we show that the rank of the performance of a fund within a fund family has significant explanatory power to explain the growth rate of this fund.

In this paper, we provide an alternative insight into the role played by fund families. Rockinger (1996) found that, ceteris paribus, the growth rate of US funds is higher if they belong to a larger family. He mentioned, as an explanation, the ease of shifting wealth from one fund to another if funds belong to a larger family. He also considered the possibility that a larger fund family could provide better research that would profit the composing funds. Last, he mentioned the possibility that loads may be lower for within-family transactions than for between-family ones. Sirri and Tufano (1998) also find that funds "belonging to larger complexes grow more rapidly than other funds." They advance the hypothesis that this higher growth rate is due to costly search: A large fund family will attract more attention and will, therefore, attract more capital. We verify that funds belonging to larger complexes attract more capital. Yet, we show that French banks and insurance companies, which are the managers of mutual funds, are able to retain the wealth of customers because of high switching costs. One possible reason why banks create new funds could reside in their wishing to provide their customers with several investment vehicles in case they are dissatisfied with a given one. This does not preclude strategic pruning considerations whereby banks eliminate less performing mutual funds that get merged into new ones. Other contributions that consider fund families are by Nanda, Wang, and Zheng (2000) and Ivkovich (2000) who focus on "stars" and study how their presence in a fund family may affect the complex as a whole due to spillovers.

# 2 Methodology

From a methodological viewpoint, this research uses the econometrics of panel data.[2] We start with a short presentation of our generic model and discuss how it relates to other models that may be found in the literature.

In a typical panel estimation, one relates the observation of some entity $i$ at time $t$, written generically as $y_{i,t}$, to some explanatory variables, $x_{i,t}$. For instance, $y_{i,t}$ could represent the growth rate of a fund and $x_{i,t}$ a performance measure.[3] A panel regression assumes that $y_{i,t}$ and $x_{i,t}$ are related by a linear relation such as

$$y_{i,t} = \mu + \delta_i + \gamma_t + x_{i,t}\beta + e_{i,t}, \qquad i = 1, ..., N,\ t = 1, ..., T, \tag{1}$$

where $\mu$ is a general constant, $\delta_i$ a fund specific effect, and similarly, $\gamma_t$ a time (year) specific effect. $T$ is the number of observations for fund $i$.[4] For identification purposes, it is necessary to assume that $\sum_i \delta_i = 0$ and $\sum_t \gamma_t = 0$.

Various justifications may be given why fund specific effects should be included in the regression. For instance, fund managers may have different reputation or charisma. Typically, some of the fund managers are considered "gurus" by the media. Their media coverage may have a positive impact on investor's demand of their fund. Another possibility is that certain funds provide their clients with services that are not quantifiable or that are unobservable to the econometrician. Examples of such services are better looking or more frequent publications, more detailed information about the fund's activities, or even the possibility to write checks on a fund.

The year effect allows to take into account that the broad economic perspective is likely to affect both the fund performance and the demand of mutual funds. Warther (1995) investigates cash flows to the mutual-fund industry as a whole. For instance, if in a given year foreign investors decide to invest into French mutual funds, the growth rates of all funds will be higher than in an other year where no such investments take place.

Several techniques may be used to estimate equation (1). If we neglect $\gamma_t$, for the sake of simplicity of notations, and take averages through time, we obtain for each fund $i$

$$\overline{y}_i = \mu + \delta_i + \overline{x}_i\beta + \overline{e}_i, \tag{2}$$

[2] For a recent textbook, one may consult Wooldridge (2001), or Mátyás and Sevestre (1995) for some of the subtler aspects.

[3] The notations extend straightforwardly if $x$ has many components.

[4] Here, we assume that we have the same number of observations for each fund. In the actual implementation, we will use a panel with an unequal number of observations for each fund, i.e. an unbalanced panel.

where $\overline{y}_i = \frac{1}{T}\sum_{t=1}^{T} y_{i,t}$, and similarly for $\overline{x}_i$ and $\overline{e}_i$. The ordinary least squares estimation of equation (2) is the so-called between regression. Subtracting equation (2) from equation (1) yields the within regression

$$y_{i,t} - \overline{y}_i = (x_{i,t} - \overline{x}_i)\beta + e_{i,t} - \overline{e}_i. \tag{3}$$

Estimation of this relation, for all $i$ and $t$, gives consistent parameter estimates. In these specifications, the fund specific effects $\delta_i$ are assumed to be constant over time. For estimation purposes, this is fine. For simulation purposes, it would be restrictive and the assumption of random effects would be more appropriate. This generalization does not come without a price, however, because the individual effect $\delta_i$ and the explanatory variables are likely to be correlated. In this case, standard estimation methods provide biased estimators. For this reason, we will focus in our empirical work on the within regression (3). We will show below that this specification relates to certain specifications that can also be found in the literature.

In our empirical work, we relate the growth rate of funds to certain time independent variables such as the fees asked by a fund. It is likely that such characteristics of funds vary over time. However, because these variables have not been collected historically in our data set, they are unavailable in the time dimension. More precisely, we know their value at mid 2000. In this case, the basic regression model (1) can be written as

$$y_{i,t} = \mu + \delta_i + x_{i,t}\beta + z_i\alpha + e_{i,t}, \tag{4}$$

where $z_i$ would be a fund characteristic that does not depend on time. Inspection of equation (4) reveals that if one applies the within regression to this equation, the parameter $\alpha$ disappears. For this reason, in order to investigate the relation between $\delta_i$ and $z_i$, we perform an investigation in two steps. First, we estimate the within regression (3) to get $\beta$, and obtain an estimate of the constant $\mu + \delta_i$. Second, we linearly regress $\mu + \delta_i$ on $z_i$. This yields a consistent estimate of $\alpha$.

# 3 Data

## 3.1 French fund categories

In France, mutual funds are generically named *OPCVM*, which stands for *Organisme de Placements Collectifs en Valeurs Mobilières*. Within this broad category, there are two large subcategories that differ mainly in their legal aspects. The category *SICAV* corresponds to *Société d'Investissement à Capital Variable*. *SICAV* are from a legal point of view assimilated to registered companies and its manager has a limited liability. They issue shares of stock and must have a board of directors and shareholder meetings.

To avoid double taxation, *SICAV* are not taxed on their value added. *SICAV* are rather restricted in terms of their reporting obligations. The other category are *FCP,* meaning *Fonds Commun de Placement*. A *FCP* is attached to an investment company, typically a bank. The *FCP* delegates to the investment company the administrative duties, the conservation of the shares, as well as the financial management. A *FCP* issues shares, the ownership of which entitles to a fraction of the value of the properties of the fund. The legal entity *FCP* has been created to provide more flexibility than *SICAV,* yet they are, from all other aspects, comparable. For this reason, we will in this study, work with both types of entities.[5]

## 3.2 Origin of the data

For this research, we obtained a panel of mutual fund data from Micropal. We restricted our analysis to equity funds that invest in France. Thus, we leave French funds that invest abroad to some other research. The database is, unfortunately, not survivorship bias free. Consequently, there may have been a substantial amount of funds that disappeared over the time period investigated. Since funds that disappeared probably did so because their performance was bad and their growth rate poor, this survivorship bias could lead to estimates of the performance-growth relation that are overly strong. The importance of survivorship bias has been emphasized by Brown, Goetzmann, Ibbotsen, and Ross (1992), Malkiel (1995), Elton, Gruber, and Blake (1995), and Hendricks, Patel, and Zeckhauser (1997). Clearly, one way to check the importance of this bias is to estimate the model using shorter samples along the time dimension. Fortunately, we found great stability in our estimates. Hence, even though we cannot exclude the presence of survivorship bias, we are confident that our results would qualitatively remind the same.[6]

## 3.3 Description of the variables

The panel contains information on the fund name, its promoter, the weekly value of a share of the fund, the asset value of the fund and the dividends paid. We have information if the fund was kept in French Franc or in Euro. We also know when a fund

[5] Fore more details, see for instance El Mahdi Boudemaghi and de Nouel (1992).

[6] It should be noticed that this problem has also plagued other European research on mutual funds. For instance, Otten and Bams (2002), who also obtained their data from Micropal had survivorship bias in their French data. Similarly, Grünbichler and Pleschiutschnig (1999) have survivorship biased data. For the mutual fund industry, in an increasingly competitive international environment, it would seem appropriate that survivorship free data sets get constructed and made available for empirical research. Such data sets should contain the management fees and loads through time. Equally important would be the knowledge of the detailed composition of funds.

converted its currency. We have information on splits and reverse splits. The information concerning the asset value is sporadic for many funds (say semi-annually) in the early years, and monthly when our panel ends. Our database contains information for 258 funds. Unfortunately, we do not have information for all funds. For 1985, the database gives us information on the share price of 24 funds. This increases to 218 funds by mid 2000. The value of net assets is provided less frequently. We observe this variable for only 4 funds in 1985. By 1990 this increases to 41 funds and we have this information for 218 funds by mid 2000, indicating that the amount of financial information disclosed has improved over time.

To get an idea of the growth of the French mutual fund industry, Table 1 reports characteristics of mutual fund markets for several areas and France. According to the Fédération Européenne des Fonds et Sociétés d'Investissement (FEFSI), by mid 2002, a total of 831.5 billion Euros was managed in a total of 7,810 French OPCVMs. France has the second largest mutual fund industry in the world, with a total net asset representing 7.1% of the world net asset. The largest industry can be found in the USA, since the capitalization of US funds corresponds to 57% of the worldwide capitalization.[7] French investors heavily invest in balanced mutual funds, while the US market is dominated by equity-oriented funds. Interestingly, the average size of US mutual funds is as high as 800 million Euros, while it is only 106 million Euros in France. The table also breaks down the total net asset by type of funds. The equity funds considered in this paper therefore constitute a subsample from that population. They account for 23.7% of the total net asset in France, while they account for 46.6% of the total net asset in the USA.

We also trace in Figure 1 the evolution of the aggregated asset value of all funds for which we have information. By 1985 the total capitalization amounts to 2 billion Euros. By 1995 we have reached 15 billion Euros and by 2000 nearly 50 billion Euros.

There are two categories of funds depending on whether a fund reinvests or distributes its dividends. Often a fund family has both types of funds. Since the stock indices do not consider reinvested dividends, we use, in our investigations, only funds without reinvested dividends. This implies that we had to discard some 53 funds out of an initial set of 258 funds. Since we only have information on the share price and net assets for 200 of the remaining funds, it is with these 200 funds that we perform the estimations reported below.

[7] Note that the other largest mutual fund industries are Luxembourg (7%), Italy (3.2%), Australia (3.1%), the UK (2.9%), and Japan (2.9%).

## 3.4 Construction of performance measures

In order to measure the importance of the fund performance-growth relations, it is necessary to quantify performance. As simple performance measures we use the return or the rank of a return within a given category.[8]

The key variable that we investigate in this research is the growth rate of a fund. To compare the growth rates of funds, it is necessary to standardize them. For this purpose, we express the net increase of value of a fund as a percentage of the fund's initial size. The growth rate of fund $i$ during year $t$ is written $G_{i,t}$. To construct it, we introduce $NAV_{i,t}$, the net asset value of fund $i$ at the end of year $t$. The growth rate is constructed using the formula $(NAV_{i,t} - NAV_{i,t-1})/NAV_{i,t-1} - R_{i,t}$, where $R_{i,t}$ is the return of the fund's shares including dividends over the period considered.

## 3.5 Descriptive statistics

In Table 2, we present various descriptive statistics concerning our data. First, we consider the average return of mutual funds and the stock market index. We notice that the fund's average long-run yearly return (including dividends) is with 14.25% somewhat smaller than the average return of the index (that does not included dividends), 15.64%. Thus, for France, we verify that in the long run, mutual funds tend to perform worse than index funds. For the USA, many studies corroborate this finding. We also notice that funds tend to have a somewhat smaller annualized monthly volatility than the index. The growth rate of funds is found to be about 11% annually. As suggested in Figure 1, this indicates that the French mutual fund industry expanded quickly. Inspection of the measure of dispersion and the percentiles indicates that there is lots of heterogeneity between the growth rates of the different funds and through time.

In the lower part of the table, we focus on some fund characteristics. All the figures reported in the lower part are computed using data for 1999. Asset value corresponds to the capitalization of the various funds, a year where we had 283 funds. The average fund contains 181 million Euros whereas the smallest fund reports 1 million. The size of funds gets as big as 3.5 billion Euros.

For each fund family, we also construct a variable that indicates the number of funds.

[8] The literature on portfolio performance measurement is huge. See, for instance, Grinblatt and Titman (1989) for a review of some of the earlier performance measures. As more sophisticated performance measures, we also considered Jensen's alpha (Jensen, 1968) and Fama-French alpha (Fama and French, 1992, 1998). To our knowledge, such a sophisticated technique to measure performance has rarely been deployed in European studies. A rare exception is the work by Otten and Bams (2002). Since results were found to be similar for the various performance measures, we only report our evidence based on past returns.

Since fund families start new funds,[9] the number of funds in a family is time varying. Focusing on the end of 1999, we find that families have on average 2.72 equity funds. At most a fund family contains 7 funds. Next, the table presents management fees. These fees range from 0.4% up to 3.4% with an average of 1.53%. The sum of the entry and exit loads, here simply called load, ranges between 0% and 9%. The average load is 3.22%. This measure does not truly reflect the actual cost of a fund. First, often the load decreases with the magnitude of the investment. Second, often the load does not apply if investors move their wealth between funds belonging to the same fund family. The last line represents statistics concerning the number of parts that must be purchased to get access to a fund. This variable ranges between 1 and 1'000'000 shares. For most funds, one share is sufficient to get access. Considering with more care the distribution of parts at the upper end of the distribution, we notice that only two funds have the one million part criterion. For funds at the upper 95 percentile, only 5'000 shares are required. Clearly, these funds are accessible to large institutions only.[10] As already mentioned, the original data set also contained 53 funds where dividends get reinvested, that were discarded.

# 4 The performance-growth relation in France

## 4.1 The basis performance-growth relation

At this stage, we wish to report the estimations obtained for various regressions, using OLS and within regressions with various effects. As we will show, incorporating individual effects changes the estimations quite significantly. Our basic regression is

$$\begin{aligned} G_{i,t} &= \mu + \delta_i + \gamma_t + \beta_1 PM_{i,t-1} + \beta_2 Vol_{i,t-1} + \beta_3 \ln A_{i,t-1} + \beta_4 (\ln A_{i,t-1})^2 \\ &\quad + \beta_5 Age_{i,t-1} + u_{i,t}, \end{aligned}$$

where $G$ is the growth rate of a fund, $PM$ a given performance measure, $Vol$ the volatility of returns, $\ln A$ the natural log of the asset value of a fund, and $Age$ the number of years of observation for a fund at a given point of time.[11]

In Table 3, we report the results of the estimations. In columns 1 to 4, we use lagged returns $R_{i,t-1}$ as performance measure. In column 1, we report OLS estimates, obtained by imposing $\delta_i = \gamma_t = 0$. In column 2, we add $\gamma_t$. The next column only involves

[9] For a study why fund families start new funds, see Khorana and Servaes (1999).

[10] We checked the robustness of the results reported below by removing those funds where more than 5000 shares are required as an initial purchase.

[11] Funds that were born before 1985, the year when our database starts, are treated in the same way as funds born in 1985 since we have no information to distinguish the two.

individual effects $\delta_i$. Column 4 involves both individual and time effects. Inspection of the parameter estimates presented in columns 1 and 2 reveals that there is not much difference between these estimates. Time effects are therefore not very important for the basis regression. Comparing column 1 with column 3 reveals rather dramatic changes in the size and age sensitivities. The introduction of individual effects induces different intercepts for the various funds and as a consequence it allows the model to be better specified. This observation shows that individual non-measurable effects exist that should be treated in a correct statistical manner. Note that, when such individual effects are introduced in the relation, the age of the fund affects positively the growth rate of a fund, contrasting with the case without individual effects.

We also have a non-linear relation with regard to the size of funds. Small and very large funds have a higher growth rate than funds with a medium capitalization. The smallest effect of the fund size is obtained when the capitalization is about 230 million Euros, while the average asset value is 181 million Euros.

Several contributions in the literature specify their basic regression somewhat differently. One specification that may be found is

$$\begin{aligned} G_{i,t} &= \mu + \delta_i + \gamma_t + \beta_1 PM_{i,t-1} + \beta_2 Vol_{i,t-1} + \beta_3 \ln A_{i,t-1} \\ &\quad + \beta_4 \text{Average industry growth}_{i,t} + u_{i,t}. \end{aligned}$$

Comparing this type of relation with the within regression (3), we notice some similarities. In particular, if $\beta_4 = 1$, the regression is very much like a within regression, since the growth rate of the fund industry is given by $(1/N_t)\sum_i G_{i,t}$. The difference with a true within regression comes from the choice of explanatory variables. If one uses as performance measure, $PM$, the overall rank or excess return, then this variable also corresponds to a deviation of the explanatory variable with respect to the average. Inspection of columns 5 and 6 of Table 3 shows that the hypothesis $\beta_4 = 1$ cannot be rejected.[12] As a consequence, there seems to be no reason not to use the within regression to take care of individual effects.

The importance of including individual effects is once more revealed in column 6. The sensitivity of size, measured by the log of assets, and of the previous rank is modified in an important manner. The parameter corresponding to size changes from $-4.07$ to $-18.09$. Given the importance of individual and time effects, we will perform all subsequent estimations with the general specification involving both effects.

[12] The same result is also reported by Chevalier and Ellison (1997) and Sirri and Tufano (1998).

## 4.2 The importance of fund characteristics for its growth

Presently, we discuss how the growth rate of mutual funds gets affected by certain characteristics that do not vary across time. We investigate this issue by using the methodology described earlier and summarized by equation (4).

As a preliminary analysis, not reported here, we computed the correlations between the various explanatory variables. We obtained significant correlations and, hence, we decided to introduce all variables simultaneously in the regression in order to avoid an omitted-variable bias. The results associated with this regression are reported in Table 4.

We see that the dummy indicating whether a fund is a SICAV ($DForS = 1$) or a FCP ($DForS = 0$) is significant and positive. The growth rate of SICAVs is, therefore, larger than the one of FCPs.

Next, the number of shares, also called parts in the context of FCPs, that one needs to purchase initially to get access to a fund, is also significant. Since it is presumably institutional investors who will be able to purchase large amounts of parts, it is not surprising that funds created for large investors also have a higher growth rate.

The Load parameter, with a value of $-4.23$, indicates that funds which are more costly to purchase or to sell will also have a lower growth rate. Management fees, on the other hand, do not seem to affect the growth rate of funds. An explanation for this finding is that SICAVs have lower management fees than FCPs. Since we introduce in the regression the dummy for SICAV/FCP, this dummy already captures the effects of lower fees.

Last, we find that the fund family size, measured by the number of funds in the family in 2000, matters.[13] Funds belonging to larger fund families have higher growth rates. Because fund invariant characteristics may also affect a fund's sensitivity to performance, most of the results are also conditioned on funds belonging to the SICAV/FCP categories, as well as on other characteristics.

## 4.3 Non-linearity in the performance-growth relation

In this section, we investigate whether there is some non-linearity in the performance-growth relation, as has been found for instance by Ippolito (1992), Gruber (1996), Chevalier and Ellison (1997), as well as Sirri and Tufano (1998) for US funds. We consider a

[13] We found a similar result using the capitalization of a fund family rather than the number of funds.

regression similar to the one proposed by Sirri and Tufano (1998),[14] that is

$$\begin{aligned} G_{i,t} &= \mu + \delta_i + \gamma_t + \beta_1 DLowPerf_{i,t-1} + \beta_2 DTopPerf_{i,t-1} \\ &\quad + \beta_3 DLowPerf_{i,t-1} \times R_{i,t-1} + \beta_4 DMidPerf_{i,t-1} \times R_{i,t-1} \\ &\quad + \beta_5 DTopPerf_{i,t-1} \times R_{i,t-1} + u_{i,t}. \end{aligned} \tag{5}$$

where the dummy variables, $DLowPerf$, $DMidPerf$, and $DTopPerf$, correspond to past return belonging to its lowest, middle, or upper tercile respectively.

As in Sirri and Tufano (1998), the parameter of $LowPerf$, $MidPerf$, and $TopPerf$ measures the sensitivity of the growth rate to past performance. Inspection of Table 5 reveals that the top performers have a sensitivity of 0.66, whereas the lowest performers have a sensitivity of 0.42. Moreover, a formal test of the hypothesis that the sensitivity of top performers is the same as of low performers gets rejected with a p-value of 1.68%. When we consider the sensitivities of mid performers and low performers, we find an even bigger, more significant difference. These tests show that French investors do not make a significant difference between mid and top performers but are more attentive to the performance of these funds relative to the one of bad performers. As a consequence, also for our French data set, we find an asymmetry in the performance-growth relation. This asymmetry is, however, of a somewhat different nature than for US funds where top performance plays a key role.

## 4.4 Non-linearity in the performance-growth relation due to age

The contribution by Chevalier and Ellison (1997) demonstrates that, for old US mutual funds, the growth rate is less affected by performance than for young funds. Even though these authors do not provide an explanation why consumers should react less to the performance of old funds than to the one of young funds, it is not difficult to find an economic intuition why such a relation could get observed. For instance, in a long-run relation, consumers who were satisfied on average may forgive a bad performance in one year. To study this phenomenon, we define $DAge^{x-y}$ as the dummies taking the value 1 if a fund has between $x$ and $y$ years of age, 0 otherwise. We chose various pairs for the $x$ and $y$ in the set $\{(1-2),(3-5),(6-10),(11-15)\}$.[15] We then consider the following

[14] The specification in Sirri and Tufano (1998) differs slightly from ours. First, they use 5 rather than 3 subgroups for past performance. Given that we have a smaller sample, this choice appears legitimate. They also report their regressions for three subsamples. Second, their specification assumes a given intercept for the various subgroups. We estimate the intercept.

[15] We selected many types of such pairs, yet, the results remained quantitatively the same as the ones reported below. We drop the $DAge^{11-15}$ dummy for identification purposes.

specification:

$$\begin{aligned} G_{i,t} &= \mu + \delta_i + \gamma_t + \beta_1 DAge_{i,t-1}^{1-2} + \beta_2 DAge_{i,t-1}^{3-5} + \beta_3 DAge_{i,t-1}^{6-10} \\ &\quad + \beta_4 R_{i,t-1} + \beta_5 DAge_{i,t-1}^{1-2} \times R_{i,t-1} + \beta_6 DAge_{i,t-1}^{3-5} \times R_{i,t-1} \\ &\quad + \beta_7 DAge_{i,t-1}^{6-10} \times R_{i,t-1} + \beta_8 Vol_{i,t-1} + \beta_9 \ln A_{i,t-1} + \beta_{10} (\ln A_{i,t-1})^2 + u_{i,t}. \end{aligned}$$

In Table 6, we present the estimation of this specification. The results are disappointing. The dummies corresponding to the direct effect are non-significant. We recognize, however, that the sign of the parameters and their magnitude hint in the direction that younger funds have a smaller growth rate than older funds. When we inspect the interactions between age and performance, again none of the parameter estimates is significant. It seems, therefore, that for France there is not much evidence that the growth rate of older funds has a different sensitivity to performance than young funds.

# 5 The role of fund families

At this stage, we recognize that French funds have a different performance-growth relation than their US counterpart. This leads us to consider economic reasons why mutual funds in France may behave differently. We suggest that segmentation of fund families is the reason for this finding. Such a segmentation could come from the fact that SICAVs and FCPs are mostly promoted by large French banks. Yet, the change of bank involves rather heavy costs. First, anecdotal evidence suggests that it is not easy to open a bank account in France. In addition, once a bank account has been opened, a bank employee often proposes to the customer long-term investment vehicles such as saving plans for housing.[16] Therefore, it is easier for consumers to stick to one bank. One alternative would be to have various accounts in different banks. Casual evidence suggests that most consumers do not use different banks. This observation leads us to conjecture that capital will be shifted around fund families, rather than between fund families.

## 5.1 Test 1 of the bank-bias conjecture

A first test of this conjecture is to consider the performance of fund families. If we find that the growth rate of fund assets is independent of performance, this would suggest that French customers are bonded to their bank. As their labor income flows on their account, we expect them to stick to their bank, and to invest in the bank's funds rather than in an optimal fund, that would possibly belong to a competing bank.

[16] The PEL, *Plan d'Epargne Logement*, consists in depositing regularly certain amounts on a specially set account. After some time, it is possible to obtain a credit at a relatively low rate.

We present now the construction of fund-family specific variables. In our construction, we follow Nanda, Wang, and Zheng (2000) who focus, in their study, on the importance of star funds for the fund family. Our notation is close to theirs.

For each fund $i$ belonging to a given fund family $f$, we construct a capitalization-based weight $w_{i,t} = NAV_{i,t}/\sum_i NAV_{i,t}$, by taking the sum over all the funds that belong to the family $f$ at time $t$. All the summations that follow should be interpreted in this sense. With this weight, we construct fund-family performance measures. The weighted average of fund family return is

$$FFR_{f,t} = \sum\nolimits_i w_{i,t} R_{i,t}.$$

To measure the growth of a family, it is necessary to aggregate the cash inflows/outflows of its funds. We define $FFNAV_{f,t} \equiv \sum_i NAV_{i,t}$ as the net asset value of a family. The new money flowing into a single fund is

$$NewMoney_{i,t} = NAV_{i,t} - NAV_{i,t-1}(1 + R_{i,t}),$$

and the growth rate of a fund family $f$ during period $t$ is

$$FFG_{f,t} = \sum\nolimits_i NewMoney_{i,t}/FFNAV_{f,t-1}.$$

We explain the growth rate of the fund family by past returns, $FFR_{f,t-1}$. We also use as explanatory variables the size of the fund family, $FFSiz_{f,t-1}$, defined as the number of funds in a family at a given point of time, and the risk of the family, defined as the weighted volatility, $FFVol_{f,t-1} = \sum_i w_{i,t} Vol_{i,t-1}$. Thus, the following basic fund-family growth regression is estimated with panel techniques

$$FFG_{f,t} = \mu + \delta_f + \gamma_t + \beta_1 FFR_{f,t-1} + \beta_2 FFSiz_{f,t-1} + \beta_3 FFVol_{f,t-1} + u_{f,t}.$$

In Table 7, we present the results of this estimation.[17] Since we are interested in fund families, we run the estimations when there are at least two funds in a family. As conjectured, we find that fund-family performance is not a determinant of a family's growth. In addition, the number of funds in a family is not a determinant of a family's growth. Last, the level of risk also does not explain the growth rate.

[17] We also experimented with a regression such as

$$FFG_{f,t} = \mu + \delta_f + \gamma_t + \beta_1 FFR_{f,t-1} + \beta_2 \ln(FFNAV_{f,t-1}) + \beta_3 \left(\ln\left(FFNAV_{f,t-1}\right)\right)^2 + \beta_4 FFVol_{f,t-1} + u_{f,t},$$

yet, the results were similar in that past performance plays no role.

### 5.2 Test 2 of the bank-bias conjecture

A further test of the bank-bias conjecture is whether the standardized rank of a fund within a given fund family has some additional information content. To address this issue, we construct for each fund in a given family, the fund's rank based on past returns. We also standardize this rank by dividing the rank measure by the total amount of funds in the family. This means that the top performer will have a standardized rank of 1. If there are 5 funds in a family, the fund ranked second will have a standardized rank of 4/5. Then, we run the regression (5) with this additional variable, denoted $FFPerf_{f,t-1}$.

Table 8 displays the various estimations. As expected, we notice that the rank of a fund within a given family adds information. The coefficient takes the value 10.03 and is significant with a p-value of 2%. To gain an intuition of the economic significance of the parameter estimate 10.03, consider a fund belonging to an average fund family. The median fund family, for which we have all the required data to perform the regression, contains two funds. This means that if a fund changes its rank, from second to first, its growth rate will improve by $0.1003 \times 0.5$. This amounts to about 5% in terms of growth rate of the fund. This shows that, also from an economic point of view, the rank of a fund in the family, based on past returns, matters.

We also estimated the regression by introducing dummies corresponding to various time intervals. We interacted these dummies with the rank-of-fund-in-family variable. For none of our experiments did we obtain a significant estimate. For later years, we obtained at most a negative, yet insignificant, parameter. These results suggest that, for France, there was no improvement during recent years in the segmentation of the mutual fund industry.

## 6 Conclusion

In this paper, we investigate whether certain features that have been observed for mutual funds in the USA are also present in French funds. We obtain evidence that, also in France, past performance, measured by various performance measures, matters for the future growth of a fund. We also notice a greater sensitivity of top and average performers than for small performers. This result contrasts somewhat with US evidence where this relation is more pronounced, indicating a change in the sensitivities for top performers only. This observation for French funds implies that investors will allocate wealth away from true losers, but not necessarily to overall top performers. This in turn suggests that wealth may not be shifted between fund families.

The phenomenon where investors reallocate their wealth within a fund family rather than between families is referred to as bank bias. We corroborate the existence of a

bank bias in France by observing that past performance of a family has no implication on a families future growth. We also find that the rank of a fund within a family adds information.

A direction for further research could be a poll that asks banks located in France about the possibility, and especially the costs, for their clients to allocate wealth in other funds. Our finding has also some policy implications that deserve further investigations.

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# Captions

**Table 1:** The table reports the characteristics of mutual fund markets aggregated at different levels. The first column reports the total net asset (in billion Euros). Columns 2 to 6 present the asset allocation of mutual funds, in percentage. Column 7 displays the number of funds. All figures are obtained from Fédération Européenne des Fonds et Sociétés d'Investissement (FEFSI) (website: www.fefsi.org) and are of 30 June 2002.

**Table 2:** $R$ corresponds to fund returns, $R_M$ to market returns, $R_{1m}^f$ is the one-month risk-free rate. $Vol$ is the annualized volatility, $G$ is the growth rate of the assets of funds. All these measures are computed from monthly data and are annualized. $p05$ and $p95$ are the 5 and 95 percentiles. The lower part of the table involves data for 1999. Asset value is the capitalization of funds. Fund family size measures how many funds belong to a given fund complex. Fees are the annual management fees. Load is the sum of front and exit load. It represents an upper bound to the loads actually charged by funds. Initial shares indicate how many shares must initially be bought to get access to a fund. Share price is the value of one share, in Euro, of a fund.

**Table 3:** Column 1 corresponds to an OLS regression. Columns 2 to 4 are panel regressions with time specific, individual specific, and both individual and time specific effects. Column 5 corresponds to an OLS regression where year effects are implicitly taken into account. Column 6 introduces individual effects. $R^2$ is an adjusted measure of determination. The test of the null hypothesis that $\delta_i = 0$ was always rejected with a p-value of 0.000.

**Table 4:** This table investigates the importance of time-invariant fund characteristics. $DForS$ is a dummy taking the value 1 if a fund is a SICAV and 0 if it is a FCP. $PartCat$ is a categorical variable taking the values 1, 2, and 3 depending on the amounts of shares that need to get purchased to get access to a fund, being in the smallest up to the largest tercile.

**Table 5:** This table investigates whether past performance interacts non-linearly with the growth of funds. We use annual return as performance measure.

**Table 6:** This table investigates whether age has a non-linear impact on the growth rate of funds. $DAge_t^{x-y}$ corresponds to a dummy variable taking the value 1 if a fund has an age between $x$ and $y$ years in year $t$.

**Table 7:** This table reports the result of the panel regression of a fund family growth on the family's past performance, measured as the capitalization-weighted return $FFR$.

We also use as explanatory variables the size of a fund family measured by the number of funds, $FFSiz$, and the capitalization weighted volatility, $FFVol$. A fund is included if there are at least two funds in the family.

**Table 8:** This table presents the same regression as Table 5 but introduces, in addition, the rank occupied by a fund in the family. This rank is obtained as the rank of the return of a fund in a given family divided by the number of funds in a family. A standardized rank of 1 is therefore a top performer. Only funds that belong to families with at least two funds are included in the regressions.

**Figure 1:** This figure displays the evolution of the total capitalization of equity funds contained in our database. Figures are in Euro.

| | Total net asset (in Euro) | of which: by type of fund | | | | | Number of funds |
|---|---|---|---|---|---|---|---|
| | | Equity (in %) | Bond (in %) | Money Mkt (in %) | Mixed (in %) | Other (in %) | |
| World | 11.659 | 41.8 | 20.2 | 26.0 | 8.2 | 1.8 | 52,428 |
| - The USA | 6.648 | 46.6 | 15.1 | 33.1 | 5.1 | 0.0 | 8,322 |
| - Europe | 3.472 | 34.4 | 26.7 | 16.7 | 13.8 | 1.7 | 27,584 |
| - France | 0.832 | 23.7 | 16.5 | 36.1 | 23.8 | 0.0 | 7,810 |

**Table 1. Characteristics of mutual fund markets**

| | Average | Std | Median | p05 | p95 |
|---|---|---|---|---|---|
| $R$ (%) | 14.25 | 18.60 | 17.07 | -19.95 | 42.90 |
| $R_M$ (%) | 15.64 | 19.18 | 19.39 | -27.63 | 41.30 |
| $R^f_{1m}$ (%) | 5.71 | 2.71 | 4.66 | 3.37 | 11.45 |
| $Vol$ | 16.35 | 6.41 | 15.04 | 8.53 | 28.62 |
| Growth rate $G$ (%) | 10.99 | 39.56 | 5.31 | -35.07 | 74.79 |
| | Average | Std | Median | Min | Max |
| Asset value (million Euros) | 181.15 | 456.24 | 39.81 | 1 | 3489.25 |
| Fund family size | 2.72 | 1.99 | 2 | 1 | 7 |
| Fees (%) | 1.53 | 0.48 | 1.5 | 0.4 | 3.4 |
| Load (%) | 3.22 | 1.52 | 3.0 | 0 | 9 |
| Initial shares | 11043.72 | 99865.85 | 1 | 1 | 1,000,000 |
| Share price (Euro) | 471.49 | 990.72 | 229.85 | 14.1 | 8236.61 |

**Table 2. Descriptive statistics**

| Model | Models with past return 1 OLS | 2 $\gamma_t \neq 0$ | 3 $\delta_i \neq 0$ | 4 $\gamma_t \neq 0$ $\delta_i \neq 0$ | Models with rank of past return 5 OLS | 6 $\delta_i \neq 0$ |
|---|---|---|---|---|---|---|
| Const | 50.05* | 40.49* | 114.12* | 131.05* | Const | 3.99 | 47.32* |
| | (4.38) | (15.4) | (6.6) | (15.63) | | (4.60) | (6.40) |
| $R_{t-1}$ | 0.48* | 0.64* | 0.67* | 0.56* | $Rank(R_{t-1})$ | 22.95* | 18.70* |
| | (0.06) | (0.13) | (0.07) | (0.15) | | (3.67) | (3.97) |
| $Vol_{t-1}$ | -0.96* | -0.45 | -0.49* | -1.17* | $Vol_{t-1}$ | -0.24 | 0.22 |
| | (0.18) | (0.39) | (0.19) | (0.48) | | (0.20) | (0.22) |
| $\ln A_{t-1}$ | -11.72* | -12.30* | -41.86* | -43.24* | $\ln A_{t-1}$ | -4.07* | -18.09* |
| | (2.05) | (2.07) | (3.66) | (3.69) | | (0.59) | (1.64) |
| $(\ln A_{t-1})^2$ | 1.20* | 1.22* | 1.68* | 1.74* | $AvgG_t$ | 0.96* | 0.90* |
| | (0.27) | (0.27) | (0.46) | (0.46) | | (0.12) | (0.11) |
| $Age_{t-1}$ | -1.51* | -1.19* | 1.52* | 2.09* | | | |
| | (0.33) | (0.35) | (0.58) | (1.03) | | | |
| $R^2$ | 0.12 | 0.14 | 0.29 | 0.30 | $R^2$ | 0.14 | 0.22 |

**Table 3. Various specifications**

| | |
|---|---|
| Const | -40.77* |
| | (16.69) |
| $DForS$ | 56.34* |
| | (7.42) |
| $PartCat$ | 15.12* |
| | (6.93) |
| $Load$ | -4.23* |
| | (2.05) |
| $Fees$ | -2.97 |
| | (7.04) |
| Fund family size | 5.03* |
| | (1.60) |
| $R^2$ | 0.33 |

**Table 4. Importance of fund characteristics**

| | | |
|---|---|---|
| Const | $\mu$ | 70.11* |
| | | (11.11) |
| $DTopPerf_{t-1}$ | $\beta_1$ | 5.04* |
| | | (2.42) |
| $DLowPerf_{t-1}$ | $\beta_2$ | 4.33 |
| | | (2.29) |
| $DTopPerf_{t-1} \times R_{t-1}$ | $\beta_3$ | 0.66* |
| | | (0.15) |
| $DMidPerf_{t-1} \times R_{t-1}$ | $\beta_4$ | 0.67* |
| | | (0.16) |
| $DLowPerf_{t-1} \times R_{t-1}$ | $\beta_5$ | 0.42* |
| | | (0.15) |
| $Vol_{t-1}$ | $\beta_6$ | -0.78* |
| | | (0.32) |
| $\ln A_{t-1}$ | $\beta_7$ | -21.54* |
| | | (2.44) |
| $(\ln A_{t-1})^2$ | $\beta_8$ | 0.55 |
| | | (0.30) |
| $Age_{t-1}$ | $\beta_9$ | 0.60 |
| | | (0.68) |
| $R^2$ | | 0.34 |
| Test $\beta_3 = \beta_5$ | F(1,937) | 5.74* |
| | p-value | (0.02) |
| Test $\beta_3 = \beta_4$ | F(1,937) | 0.03 |
| | p-value | (0.87) |
| Test $\beta_4 = \beta_5$ | F(1,937) | 6.39* |
| | p-value | (0.01) |

**Table 5. Non-linearity of performance sensitivity**

| | |
|---|---|
| Const | 157.43* |
| | (23.97) |
| $DAge_{t-1}^{1-2}$ | -0.98 |
| | (9.89) |
| $DAge_{t-1}^{3-5}$ | -0.01 |
| | (7.36) |
| $DAge_{t-1}^{6-10}$ | 0.25 |
| | (5.03) |
| $R_{t-1}$ | 0.56* |
| | (0.19) |
| $DAge_{t-1}^{1-2} \times R_{t-1}$ | -0.10 |
| | (0.21) |
| $DAge_{t-1}^{3-5} \times R_{t-1}$ | 0.02 |
| | (0.18) |
| $DAge_{t-1}^{6-10} \times R_{t-1}$ | 0.07 |
| | (0.18) |
| $Vol_{t-1}$ | -1.17* |
| | (0.48) |
| $\ln A_{t-1}$ | -44.03* |
| | (3.89) |
| $(\ln A_{t-1})^2$ | 1.79* |
| | (0.47) |
| $R^2$ | 0.31 |

**Table 6. Non-linearity of performance sensitivity with respect to age**

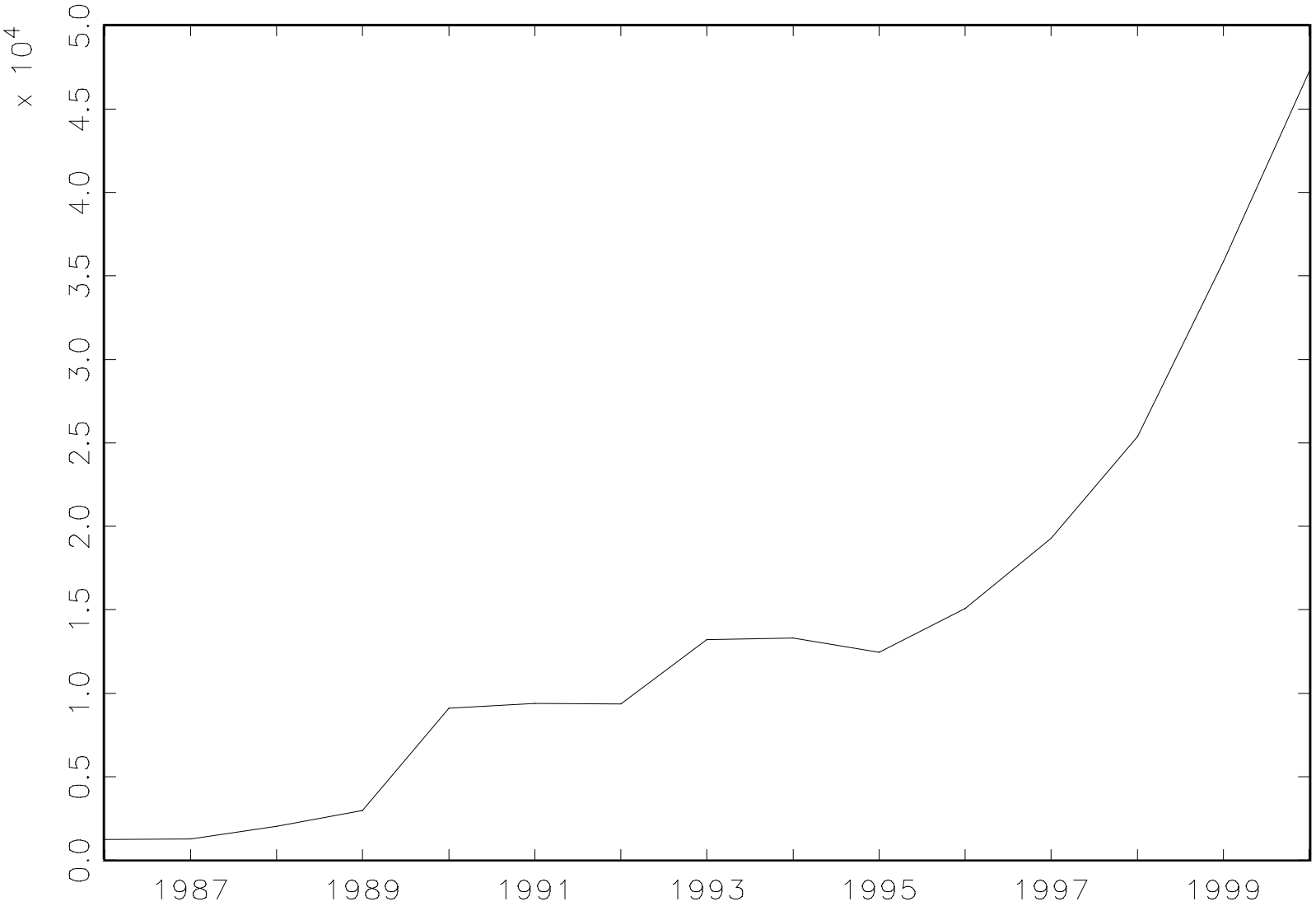
| | |
|---|---|
| Const | 0.31 |
| | (0.37) |
| $FFR_{f,t-1}$ | 0.00 |
| | (0.01) |
| $FFSiz_{f,t-1}$ | -0.02 |
| | (0.08) |
| $FFVol_{f,t-1}$ | 0.01 |
| | (0.01) |
| $R^2$ | 0.29 |

**Table 7. Family performance and family growth rate**

| | |
|---|---|
| Const | 78.81* |
| | (13.53) |
| $DTopPerf_{t-1}$ | 4.64 |
| | (2.99) |
| $DLowPerf_{t-1}$ | 3.18 |
| | (2.91) |
| $DTopPerf_{t-1} \times R_{t-1}$ | 0.52* |
| | (0.18) |
| $DMidPerf_{t-1} \times R_{t-1}$ | 0.47* |
| | (0.19) |
| $DLowPerf_{t-1} \times R_{t-1}$ | 0.21 |
| | (0.18) |
| $\mathbf{FFPerf}_{f,t-1}$ | 10.03* |
| | (4.51) |
| $Vol_{t-1}$ | -0.74 |
| | (0.41) |
| $\ln A_{t-1}$ | -23.36* |
| | (2.94) |
| $(\ln A_{t-1})^2$ | 0.65 |
| | (0.35) |
| $Age_{t-1}$ | 0.86 |
| | (0.77) |
| $R^2$ | 0.38 |

**Table 8. Importance of a fund's performance within a fund family**

Figure 1: Total asset value



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