The performance of mutual funds on French stock market:Do star funds' managers exist or do funds have to hire chimpanzees?

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1. Introduction

We test here the kahneman (kahneman 2011) results about fund managers: that is, do managers are really skilled or could any chimpanzee do the job? Recall the Lusha's effect: a chimpanzee in Russia named Lusha outperformed 94% of the country's investment funds. Her portfolio increased in value by 300% (Stewart (2010)).

Kahneman uses a persistence of performances analysis. He then suggested that good funds managers were just lucky ones. He then concludes that no skill or experience effect can be proven for fund managers: "the illusion of skill is not only an individual aberration; it is deeply ingrained in the culture of the industry."

Other academic studies conclude that the net performance of mutual funds is neutral (Carhart 1997) or inferior to the market (Jensen 1968, Malkiel 1995). However, the debate is not close since others studies suggest that mutual funds can add value (Grinblatt and Titman 1992, Otten and Bams 2002, among others). For some studies (Fama and French 2010) there is evidence of inferior and superior performance in the extreme tails of the funds distribution.

Moreover, the recent stormy period should enlighten us about the interest to invest in mutual funds: do they over perform the market? Do they smooth the losses? Do they have well managed the alternative bearish and bullish periods of the markets? Few recent studies focus on the French Stock market. Otten and Blatt 2002, for example, found that English, French, Italian mutual funds over perform the market. But their study covers the period from 1991 to

1998, before the stormy decade from internet bubble crisis, September 11, to the subprime crisis. So, in this paper, we investigate the performance, persistence and behavior of mutual funds only investing in the Paris stock exchange market from 2000 to 2012. We find that funds clearly over-perform the market on average but only on a 60 months investment horizon. Average annual excess is close to zero (+0.3%) for funds which were active over all the period. Yet, some have salient good (bad) relative performances. The challenge is then to distinguish skill from luck since funds can have extreme returns by luck. Our approach is to test for persistence in fund returns, that is, whether past winners continue to produce high returns and losers continue to underperform. Then, we apply the Carhart 1997 4-factors model, in order to evaluate the weight of the systematic drivers of the performance.

2. Performances

We use the Lipper Global Fund Screener database and select 334 funds investing only in the French market. Funds are investing in Large, Mid and Small caps. 157 funds were active during all the 2000-2012 period.

Since mutual funds are long term investments we compare the performances of markets relative to mutual funds with a 60 months moving average, an investment horizon generally proned by funds managers.[1]

Clearly (see table 1), the funds over perform the market (Fama-French index) on average. The over performance is +4.2% on average over the period. Performances are net of management fees but gross of purchase fees.

[1] The date is the investment date.

Table 1: Moving average performances over 60 months: market vs. funds

Investment Period	Market performance	Funds performance	Relative performance
dec1999-june 2007	-3.5%	0.7%	4.2%
Dec1999-june2001	-8.1%	-3.2%	4.9%
june2001-dec2003	5.7%	8.3%	2.6%
jan2004-june2007	-7%	-2.1%	4.9%

The Share of funds which over-performs is important, even when we include purchase fees (see table 2).

Table 2: Share of mutual funds which over perform the market with different purchase fees and different investment horizons

Share	0%	2%	3%	4%	5%
1 year	0.769	0.453	0.335	0.25	0.191
3 years	0.862	0.744	0.678	0.614	0.543
5 years	0.936	0.848	0.792	0.72	0.636

Moreover, figures 1 and 2 show that funds tend to over-perform more often during bearish periods than bullish ones.

Figure 1 : market (blue) vs. average over performance (60 months moving average)

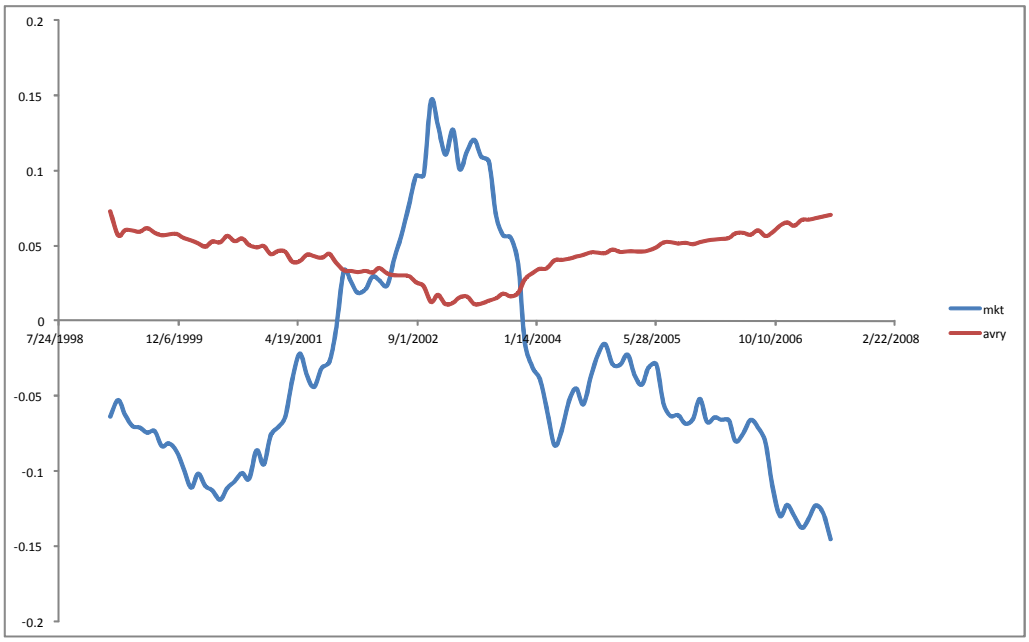


Figure 2 : average funds performances (red) vs. market (blue) (60 months moving average)

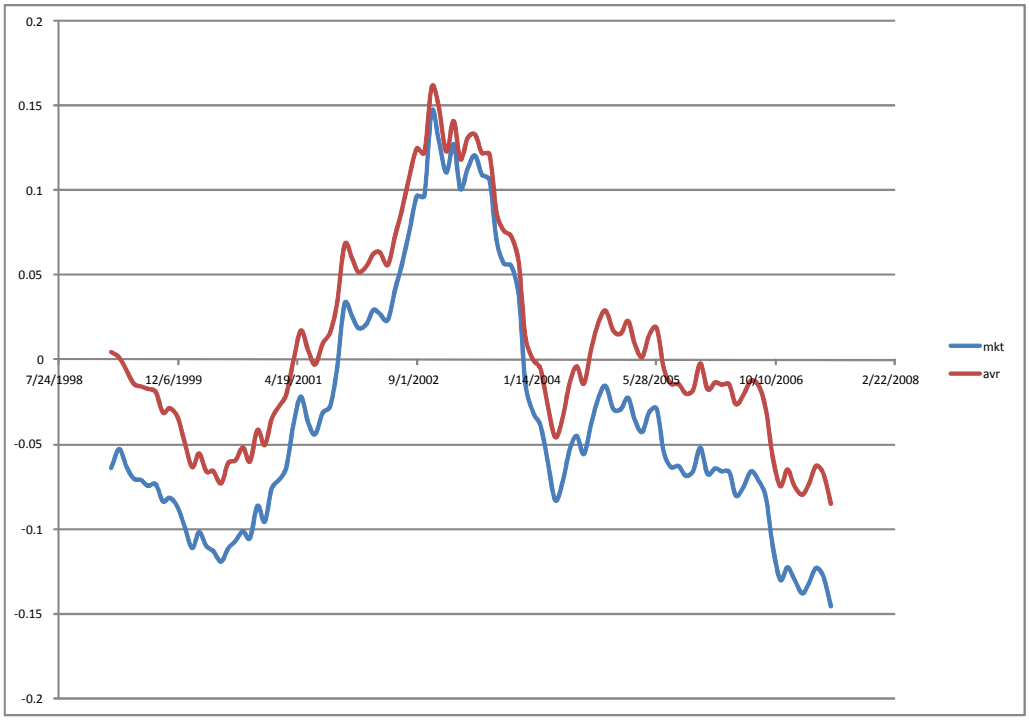
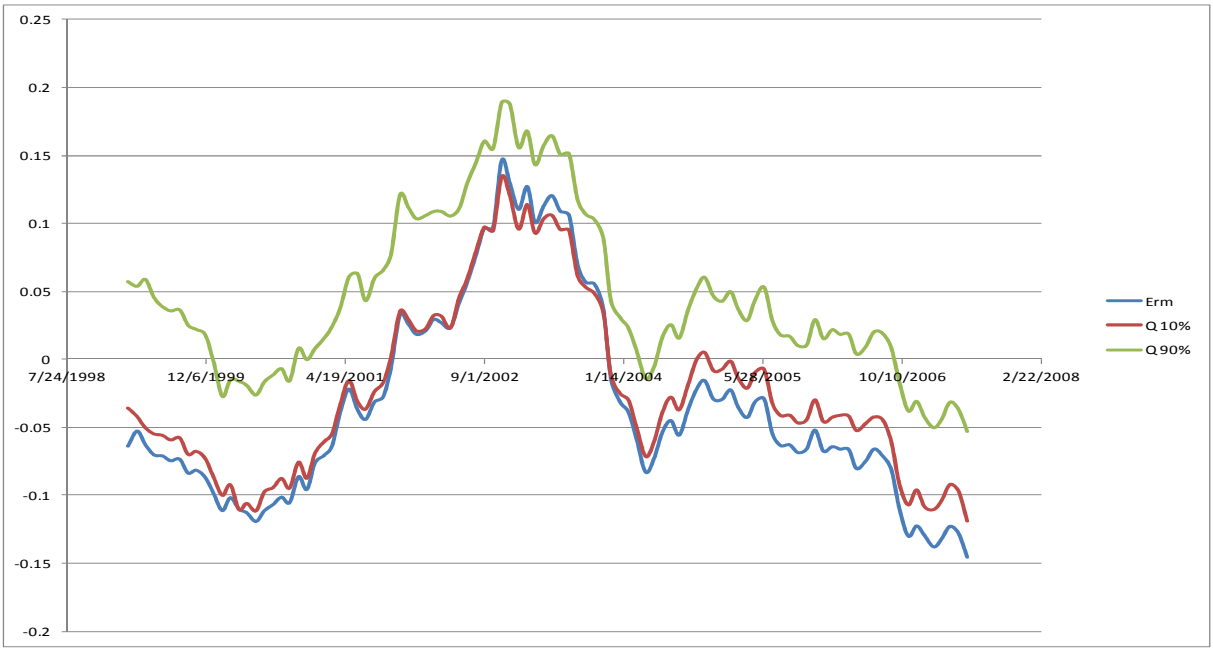


Figure3 : Over-performance distribution statistics

Figure 4: Performance distributions



As figure 4 clearly shows it, in fact a lot of funds clearly over-perform the market. And the 10% best performers (green line) strongly over-performs (for the 60 months moving average).

The available Lipper database permit us to compare the previous French equity funds to a smaller sample of French small mid equity funds. Results obtained with the small mid funds are quite similar. The funds' performance relative to the market is still good but nevertheless closer to the Small mid Caps benchmark. On average mutual funds over perform relative to the market when they invest in Small-Mid Caps.

Figure 5: Relative Funds performance (Small-Mid Caps)

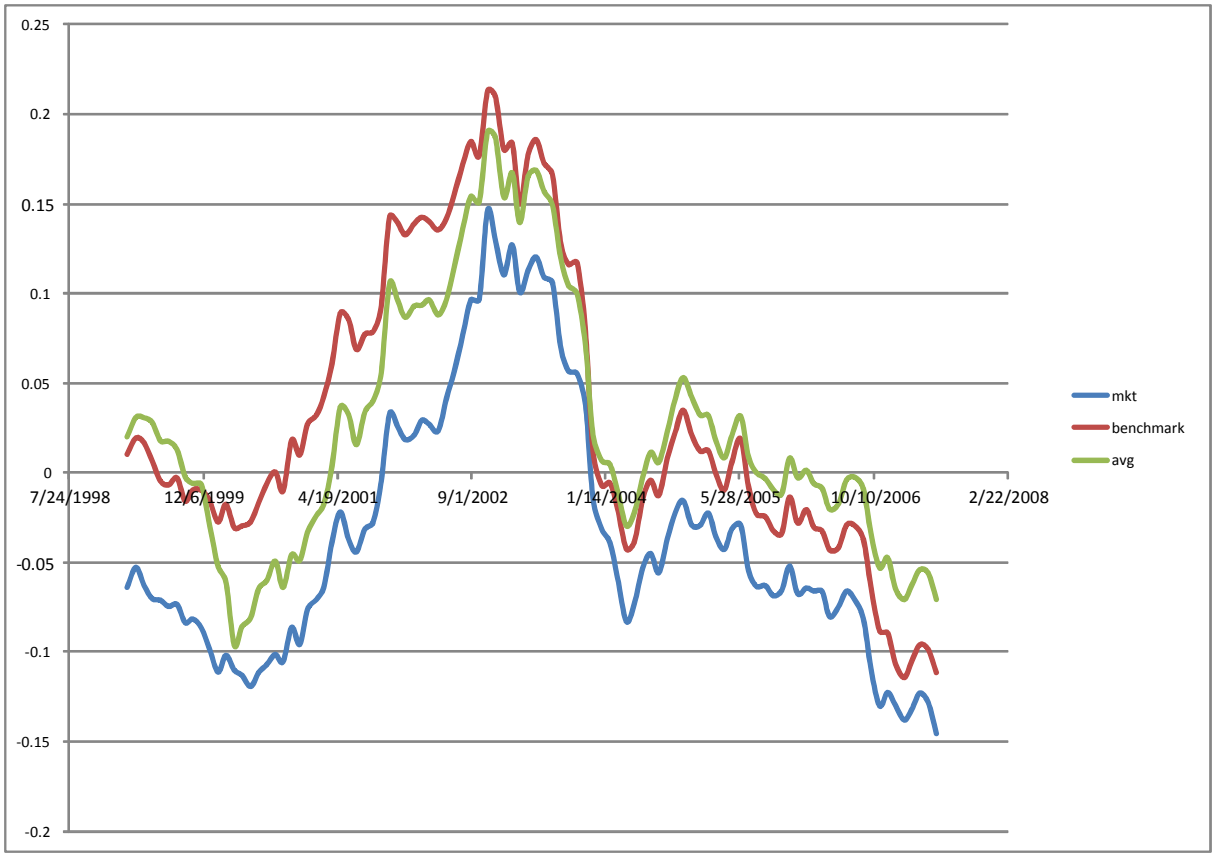


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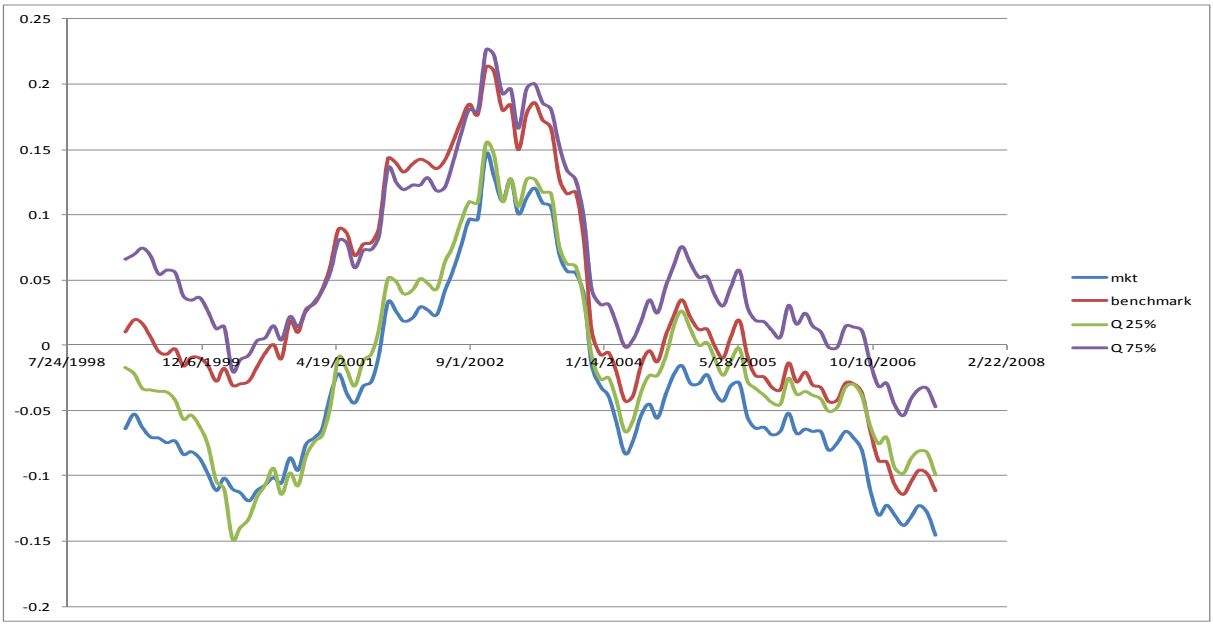
Figure 6: Distribution of performances (Small-Mid Caps)



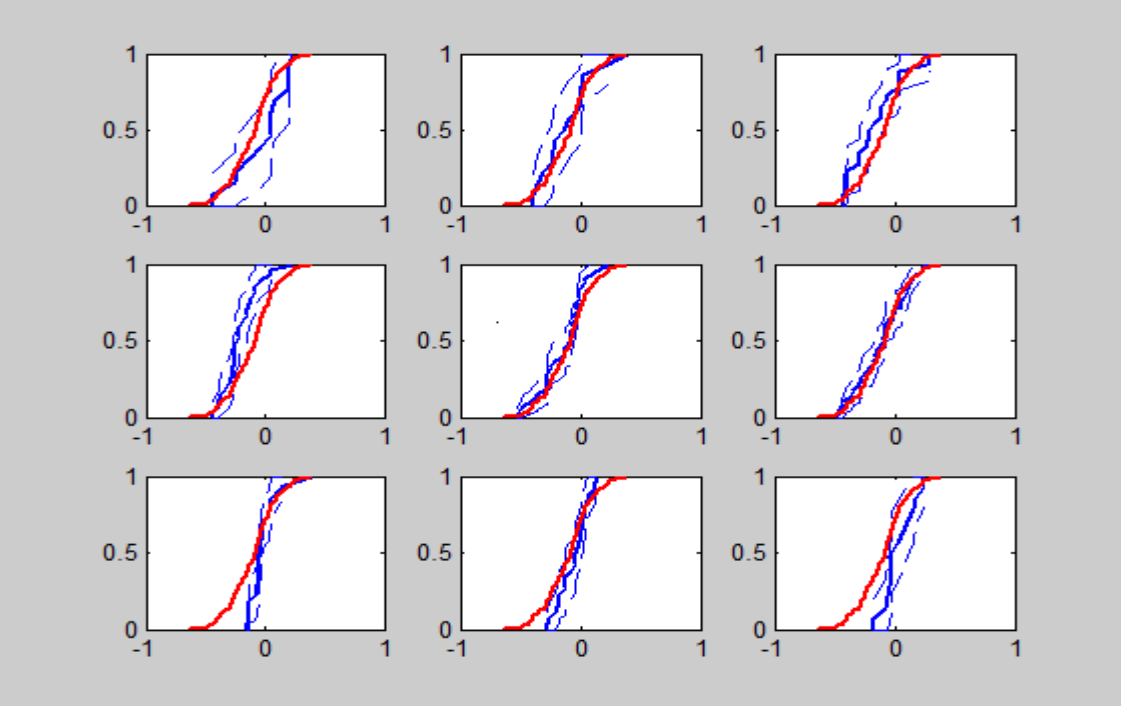
3. Is there persistence in results?

One classic question regarding funds performance is their ability to persistently enjoy excess returns. Intuition suggests that lucky fund managers will not report persistently good results, while good managers will do so: luck is only short-run. There should therefore be a relation between performance and autocorrelation: is this the case?

3.1. The distribution of autocorrelation by fund rank

We examine the link between performance and persistence by ranking funds in 10 mean monthly performance deciles. We then test the hypothesis that the Empirical Cumulative Distribution Function of the Autocorrelation coefficients (for lags comprised between 1 and 12) is the same across deciles. We use the Kolmogorov-Smirnov (K-S) goodness-of-fit test. Only lag 1 produces a KS test difference for 4 deciles (1;4;8;10)

Figure 7[2]: ECDFA lag +1 for each decile vs mean ECDFA and confidence interval



Only deciles 1;4;8;10 are different from the entire population distribution. Decile 8 and 10 ECDFA are closer to the no-autocorrelation distribution, given by the vertical at 0, so there is clearly less persistence than in the entire population. This suggests the absence of any positive persistence of good results among even (relatively) good traders. The decile 1 ECDFA is more positive than that for the entire population. This is very puzzling since it is the worst decile. The decile 4 is more negative and then exhibits negative autocorrelation. But since it is an average decile no clear conclusions can be drawn from this result.

As such, the previous month's performance has no (or a negative) impact on the next month's performance. This suggests the absence of skill among traders, even for those who have the best performances. Are the best traders just lucky?

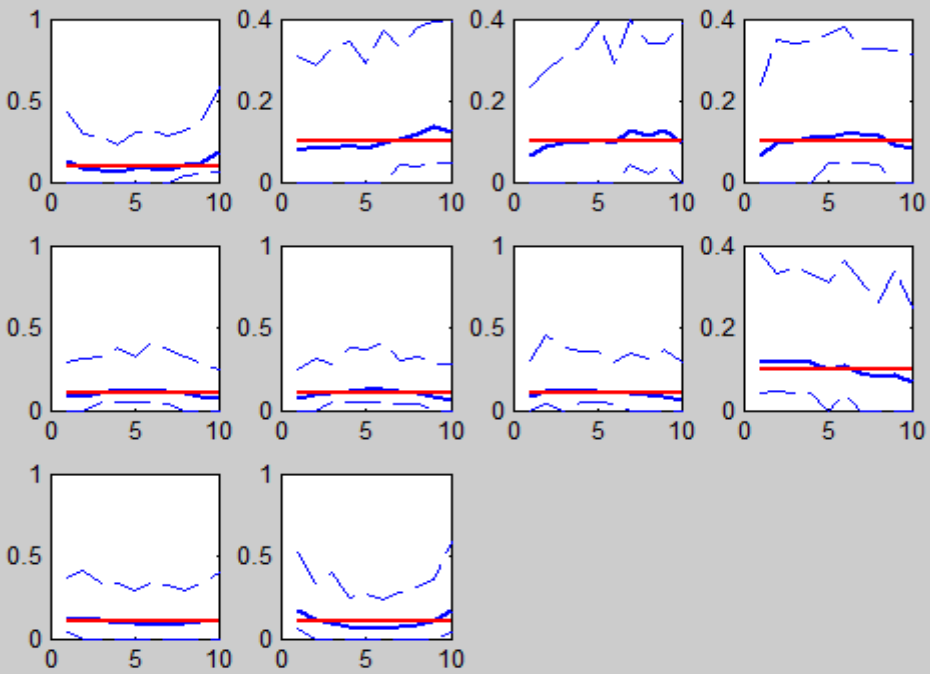
3.2. Transition analysis

The previous test appeals to the autocorrelation between monthly mean returns. Another approach is to consider the relative ranks of the competitors. We thus rank traders each month into 10 deciles. We then use the date to calculate the transition probability from one decile to another (the Markov transition matrix). In each month, this transition matrix is

[2] The black line in each plot is the ECDFA of each decile (deciles 5 and 6 are merged). The deciles are increasingly ranked from decile 1 (worst performances) in the North-West to decile 10 (best performances) in the South-East. The two blue dotted curves are the 5% confidence intervals. The red curve is the entire population ECDFA.

considered as a random draw. Hence, we construct the statistics over the sample of the frequencies for each decile and obtain the matrix of the mean transition frequency and the associated 90% confidence intervals.

Figure 8[3]: The mean frequencies of transitions from deciles 1 to 10



The figure should be read as follows: for the tenth decile, for instance, the mean frequency of being in a given decile the next month is given by the bold line. If there were no persistence, the frequency would be 0.1 for all deciles (the red line), the equi-probability. We note that being in the top decile (the winners) in a given period favors being in this decile the next period, but very very slightly. However, the associated probability of being in the first three deciles (the losers) is also over 10%. Persistence amongst good traders is thus far from being clear.

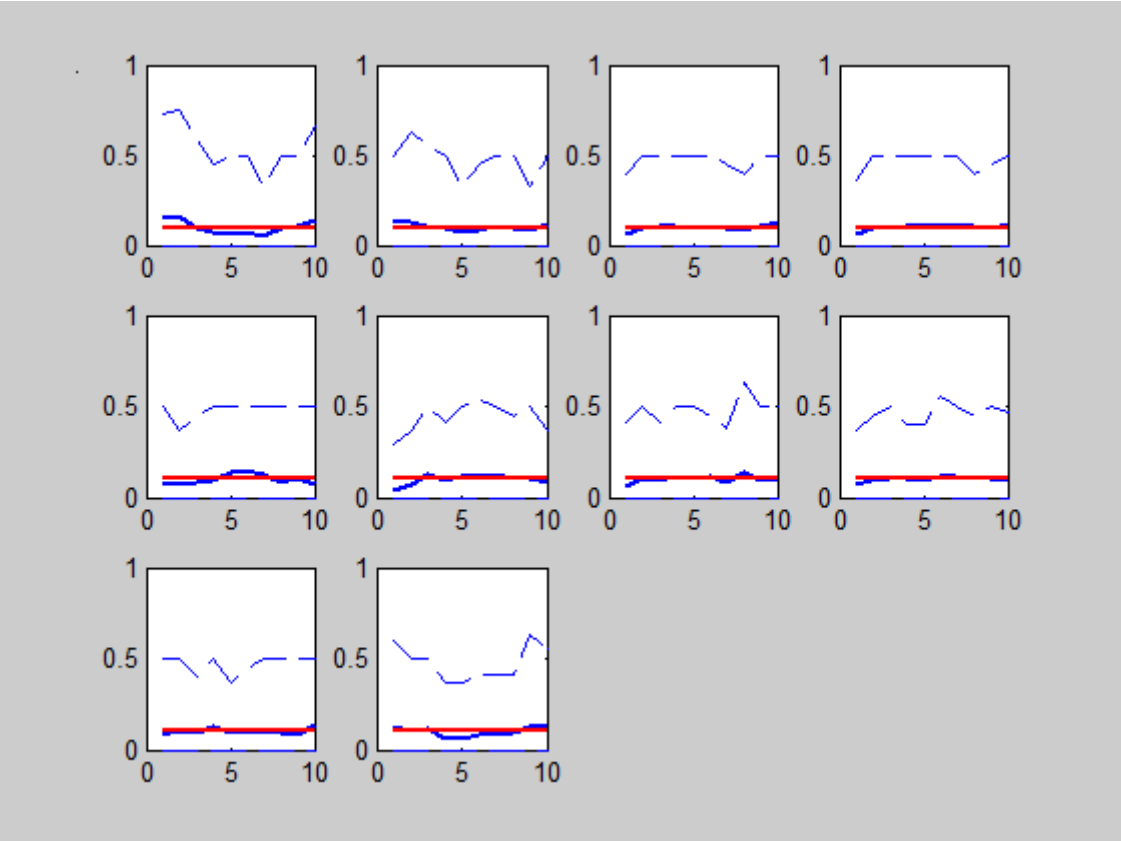
From another perspective, we have considered the frequency of a trader in a given decile to stay in the same decile the following month. This persistence seems to be stronger

[3] The two blue dotted lines show the 90% confidence intervals.

for losers (over 25%) than winners (15% in the last 4 deciles). To evaluate the frequency of being in the same decile during the N next periods (a long-term analysis), we use a Monte Carlo method. We simulate the decile paths implied by our Markovian matrix. We then compute the implied expected frequency of being in the same decile.

For Small-Mid Cap there is clearly no decile persistence.

Figure 9: The mean frequencies of transitions from deciles 1 to 10 (Small-Mid)

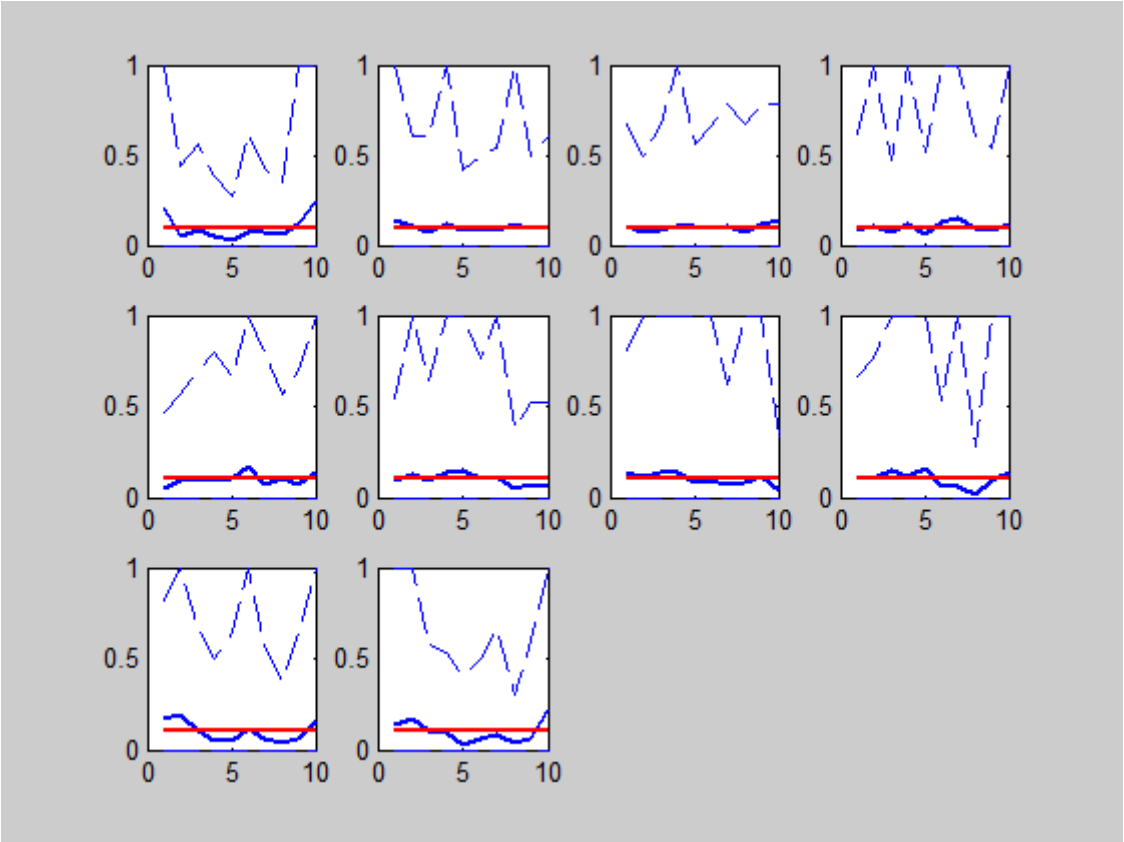


What about stars? We define stars as those who are ranked among the 10 best funds one given month at least 10 times. Figure 10 shows results for this sample.

For the first and the tenth decile, the frequency to be in the best decile the following month is close to 25%. So, the best decile of funds seems to have a positive slightly persistence. But, it is hard to conclude since this result stay inside the confident interval.

Then, nothing seems so clear; we prefer to conclude from previous methods that there is no clear persistence effect for mutual funds.

Figure 10: The mean frequencies of transitions from deciles 1 to 10 (for stars)



4.Fama-French three-factor model extended to Carhart 4 factors model

The performances are well described by the 4-model factor of Carhart (1997). It extends the Fama-French 3 factors model by introducing the momentum effect of Jegadeesh and Titman (1993).

According to Carhart (1997), the model can be thought of as a performance attribution model, where the coefficients on the factor-mimicking portfolios indicate the proportion of mean return explained by the four factors. The Carhart (1997) four-factor model is specified as follows:

$$R_t - R_{ft} = \alpha + \beta_0 (R_{mt} - R_{ft}) + \beta_1 smb_t + \beta_2 hml_t + \beta_3 wml_t + se$$

$R_t - R_{ft}$ is the risk premium; $R_{mt} - R_{ft}$ the excess return of the market (mkt), hml and smb factors are calculated as per the Fama-French (1992) three-factor model, wml (winners minus

losers) is a momentum factor, *se* the standard error. Factors and return on the total Universe comes from data provided by Kenneth French for European stock markets on his site.

Table 6: Carhart 4-factors estimation, period 2000-2012

estimation	alpha	mkt	smb	hml	wml	R2	se
Average	-0.21%	0.65	0.10	-0.03	-0.20	72.4%	0.09%
min	-1.04%	0.43	-0.44	-1.06	-0.56	46.8%	0.04%
Max	0.63%	0.85	1.24	0.77	0.16	84.6%	0.30%

Table 7: Carhart 4-factors estimation, by periods

Period	Mkt	smb	hml	wml
2000-2012	0.65	0.10	-0.03	-0.20
2000-2003	0.69	0.20	-0.18	-0.40
2003-2007	0.49	0.11	1.03	-0.12
2007-2012	0.61	0.07	0.11	-0.13

The R2 are good, the model has a high power of explanation of the risk premium.

Alphas are slightly negative; hence performance can't be attributed to portfolio active management by funds. The Alpha factor is not significant for the great majority of funds (97.7%) (Table 8) and alpha expositions is close to zero (table 9) (but only 6 funds have a significant alpha…).

Remark, in yellow, that strategies are sometimes puzzling. For example, the exposition to market is low in the bullish period 2003-2007. The momentum is negative over the period.

Table 8 : Share of funds for which factor is significant

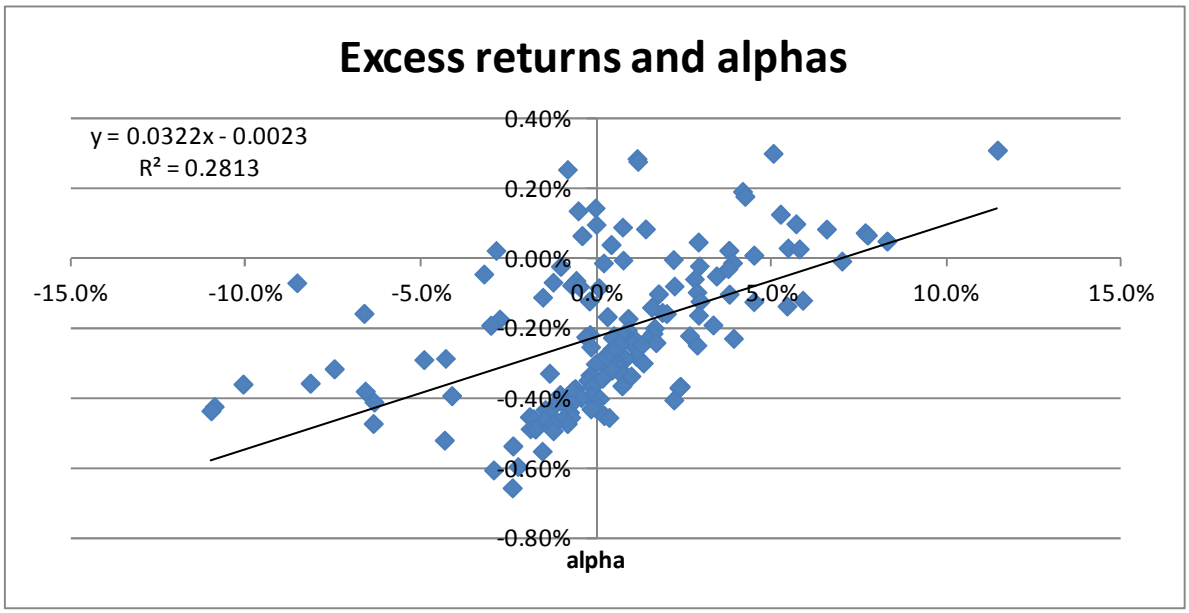
	Alpha	Market	sml	hml	wml
Equity funds	0.0224	0.9925	0.4307	0.5393	0.5917
Small-mid	0.0454	0.9696	0.8636	0.5606	0.2575

Table 9: Average factorial exposition

	Alpha	Market	smb	hml	wml
Equity funds	0.0003	0.6543	0.0047	0.0384	0.1355
Small-mid	0.0028	0.6933	0.6398	0.2546	0.1181

When we restrict to the 157 funds which were active at the beginning of the period (January 2000), there is a positive correlation between excess returns and alphas.

Figure 11: Excess returns and alphas



We can remark that the annual average excess returns of the 157 funds active during the 12 years period is only +0.31%. So, the longer (than 60 months) horizon makes the performance of the funds close to the market ones. At long term, there is no more over performance of the mutual funds. This is a classical result but we have shown that funds clearly over perform for a 5 years investment horizon, this is remarkable.

The next table 10 shows the 14th funds with alphas superior to 1% annually. We can see that some of them have high over performance and high alphas too. Those funds are only four and exhibit positive active portfolio management and good drivers of performance choices.

Table 10: Best alphas funds

name	alphas (monthly)	excess return (annual)
Indice Valor Cap Acc Open Fund Unit	0.31%	11.4%
Independance et Expansion Small Cap Actions X C	0.30%	5.0%
Chaussier Croissance	0.28%	1.2%
BNP Paribas MidCap France D	0.28%	1.2%
Oudart Opportunites France P	0.25%	-0.8%
Pluvalca Allcaps C	0.19%	4.2%
Uni-Hoche Cap	0.18%	4.2%
Pluvalca France Small Caps	0.14%	0.0%
CPR Middle-Cap France D	0.13%	-0.5%
AXA France Opportunites C	0.13%	5.3%
Oddo Generation A	0.10%	5.7%
Vendome Selection	0.10%	0.0%
Echiquier Junior	0.09%	0.7%
SG Actions France Croissance C	0.08%	1.4%

Following figures and tables focus on the factorial expositions and contributions to performances over periods.

Figure 12: Average factorial exposition

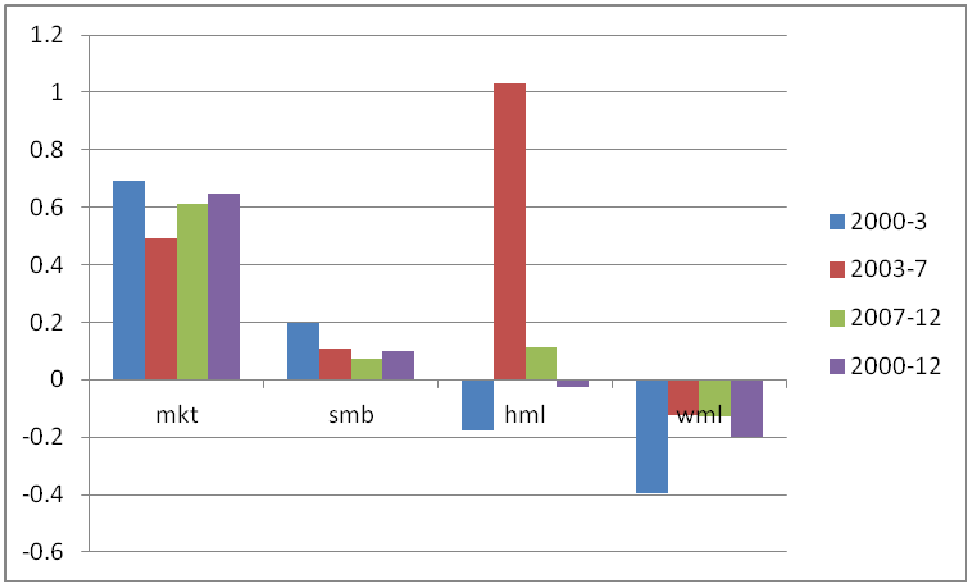


Figure 13 : factorial contribution to performance

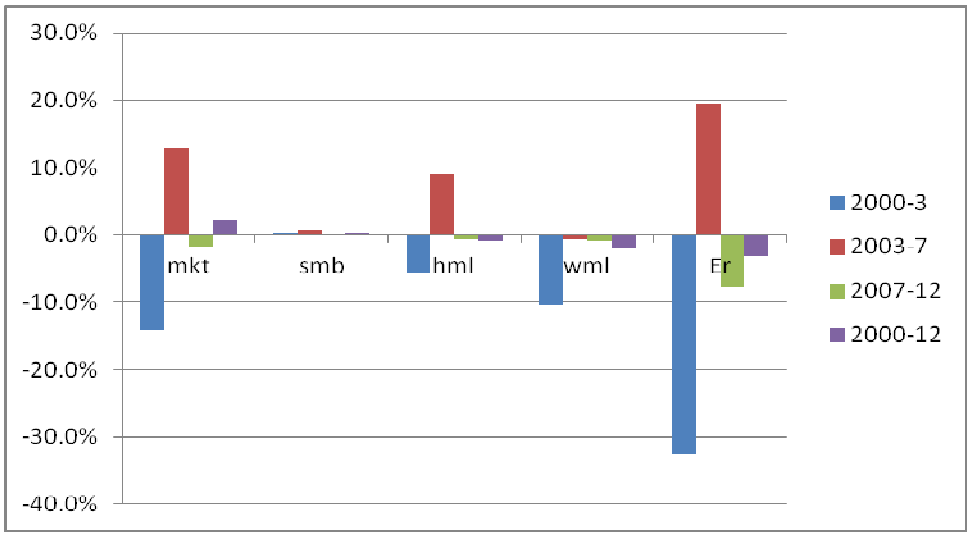

30.0%
20.0%
10.0%
0.0%
-10.0%
-20.0%
-30.0%
-40.0%
mkt
smb
hml
wml
Er
2000-3
2003-7
2007-12
2000-12

Table 11 : 4-factors contributions by periods

2000-2012	Performance	Market	SMB	HML	WML
Average	-3%	2.1%	0.2%	-0.8%	-2%
Std dev	4.7%	2.2%	0.9%	1.4%	1.1%

2002-2003	Performance	Market	SMB	HML	WML
Average	-32.7%	-14.1%	0.3%	-5.5%	-10.4%
Std dev	10.4%	2.3%	0.8%	9.5%	4.6%

2003-2007	Performance	Market	SMB	HML	WML
Average	19.4%	12.9%	0.7%	9.0%	-0.7%
Std dev	4%	3%	3.7%	2.1%	0.6%

2007-2012	Performance	Market	SMB	HML	WML
Average	-7.5%	-1.9%	-0.1%	-0.6%	-0.9%
Std dev	3.1%	0.2%	0.6%	0.8%	0.4%

The alpha factor is clearly not significantly different from zero. Hence Funds manager's skill can be rejected. The performances of the funds are clearly driven by their four elementary strategies choices. But these strategies reflect risk allocation of portfolios.

6. Concluding remarks

In our study about mutual funds investing in the French stock market we have shown that:

-funds over perform the market on average over a 60 months horizon of investment;

- few funds have very good performances;

- there are no persistence effects for monthly results.

The 4 factors model of Carhart (1997) explains well the performance of the funds. But alphas are not significant. Then performances are the consequences of investment strategies rather than a skill effect of the fund manager.

So, D. Kahneman seemed to be a little bit over pessimistic. A chimpanzee could do as well as a human fund manager but have to do the good investment strategy choices. But that's not surprising for a psycho-economist who believes in the prospect theory!

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