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ABSTRACT:

It is generally accepted that financial markets are efficient in the long run although there may be some deviations in the short run. It is also accepted that a good portfolio manager is the one who beats the market persistently along time, this type of manager could not exist if markets were perfectly efficient.

According to this in a pure efficient market we should find that managers know that they cannot beat the market so they would undertake only pure passive management strategies. Assuming a certain degree of inefficiency in the short run, a market may show some managers who try to beat the market by undertaking active strategies. From Fama's efficient markets theory we can state that these active managers may beat the market occasionally although they will not be able to enhance significantly their performance in the long run. On the other hand, in an inefficient market it would be expected to find a higher level of activity related with the higher probability of beating the market.

In this paper we follow two objectives: first, we set a basis to analyse the level of efficiency in an asset investment funds market by measuring performance, strategies activity and it's persistence for a certain group of funds during the period of study. Second, we analyse individual performance persistence in order to determine the existence of skilled managers.

The CAPM model is taken as theoretical background and the use of the Sharpe's ratio as a suitable performance measure in a limited information environment leads to a group performance measurement proposal. The empirical study takes quarterly data from 1999-2007 period, for the whole population of the Spanish asset investment funds market, provided by the CNMV (Comisión Nacional del Mercado de Valores). This period of study has been chosen to ensure a wide enough range of efficient market observation so it would allow us to set a proper basis to compare with the following period.

As a result we develop a model that allows us to measure efficiency in a given asset mutual funds market, based on the level of strategy's activity undertaken by managers.

We also observe persistence in individual performance for a certain group of funds.

JEL CLASSIFICATION: G11, G14, G23

KEYWORDS: Investment Funds, Managerial behaviour, Market efficiency, Luck versus Skill.

1- INTRODUCTION:

The recent financial crisis has called into question the validity of financial models, until now the gap between efficient market hypothesis (EMH) and real financial markets has been quiet successfully justified by allowing a certain level of inefficiency in the market in change of liquidity, so the existence of certain level of inefficiency is assumed as desirable in order to make financial markets work. The EMH approach has been criticised for its rigidity, according to Lo (2004) markets should be studied from a more evolutionary point of view in which organisms (managers) might be optimizing a utility function whose main aim is not to maximize value but to survive.

In this paper we take a behavioural approach by observing how professional fund managers act. These managers know how everyday markets work and are used to these inefficiencies, some of these professional managers undertake active strategies so we can infer they believe that they are able to beat the market. According to the EMH these managers do not have any reason to act so, but they do, and moreover, sometimes they beat the market. Of course, this can be easily explained by EMH theorists as a coincidence of punctual inefficiency and a punctually lucky manager.

According to this explanation, we could not see managers that beat the market systematically in the long run and if we take a long enough period of time we should see that luck does not exist in the long run in a given market, so the quality of a manager cannot be persistent in time.

This study follows two objectives: First, by inferring behaviour from market data we will check for the level of efficiency of a given asset investment funds market during a long enough period previous to the financial crisis. Second, we aim to detect the existence of persistence in management skill in the investment fund's managers of this same market.

2- MEASURING EFFICIENCY IN INVESTMENT FUNDS MARKETS

Fama (1991) states that, an efficient market has transaction's net present values equal to zero which means that market prices equal their fundamental values. This makes measuring efficiency a not so simple issue, mostly because of the difficulty of determining the real fundamental value of an asset or a portfolio.

In investment funds markets we must consider additional restrictions. First, it is very unlikely that we can have the composition and its variations of the whole range of funds in the market. Second, even when it is possible to have daily or weekly data this is aggregated at a portfolio level which makes almost impossible to measure the its fundamental value.

So to be able to measure efficiency in investment funds markets we take a radically different approach. We must assume that in an efficient market there is no incentive to deviate from the passive strategy, according to the C.A.P.M model (Sharpe 1964) the optimal strategy is to choose a point on the Capital Market Line (CML) which means combining free risk asset with the market portfolio. According to this assumptions we can check for efficiency by measuring dispersion around the passive strategy, the more concentrated the observations around the passive strategy are the most efficient the market is and the more dispersion we see around the passive strategy the most inefficient the market is. Though this is a very intuitive approach we must do some adjustments to obtain a proper market efficiency measure.

2.1 - MANAGEMENT QUALITY MEASUREMENT

According to Jensen (1968) we can measure management's quality by comparing the real outcome of an asset with the corresponding theoretical outcome on the Security Market Line (SML) set by the portfolio's beta coefficient. This measure is the well known Jensen's alpha.

Using Jensen's alpha to evaluate investment funds quality has some important handicaps. Beta coefficients provided by managers are normally calculated according to their own benchmarks, so using these coefficients makes the alpha coefficients comparison irrelevant. Moreover, the type of data normally provided by investment funds managers does not allow us to know if the portfolio is properly allocated, this means that taking alpha as a management quality measure implies taking beta as a good measure of risk, which could lead to an underestimation of the funds risk level.

Due to this, our management quality measurement is grounded on an allocation independent risk measure as standard deviation, and so consequently we develop a performance Sharpe ratio's (Sharpe 1994) based proposal.

2.2 - FUND PERFORMANCE, ACTIVE MANAGEMENT AND EFFICIENCY

The Sharpe's ratio allows us to easily order performance from a given group of funds, but we don't get any information about how efficiently are this funds performing or how active their management strategies are.

While trying to measure active management it is necessary to set a suitable passive portfolio in order to have a benchmark to compare with. Once this passive portfolio is set it will be possible to identify either successful active strategies or unsuccessful ones.

The CAPM model assumes that the optimal passive strategy for an investor consists in combining the free risk asset with the market portfolio, so a suitable passive strategy for a given group of funds would be a combination of bonds and the reference market index.

By calculating the Sharpe's ratio from this portfolio we obtain a passive benchmark for each fund group that will allow us to determine the level of efficiency and activity in the group.

Once set the group passive benchmark it is possible to measure the dispersion around this benchmark, this dispersion measure would give first approach to measure the level of activity, meaning that the more dispersion is observed, the more active strategies deviating from the benchmark you can find in the group. So we define as Group Dispersion Indicator the following measure:

$$GD_g^2 = \frac{\sum_{p=1}^{n} \left(S_p - S_{pp}\right)^2}{N} \qquad [1]$$

Where S_p is the Sharpe ratio of a portfolio of a given group of funds, S_{pp} is the Sharpe ratio of the passive portfolio and N is the number of funds in the group.

In a deeper analysis, the fourth order moment appears as a better way to measure the level of activity in a certain group of funds. Given that in a fully efficient market, the best strategy a manager can set is a passive strategy, we must assume that a certain level of inefficiency incentivises fund managers to undertake active management in order to beat the market. So in highly efficient markets with highly passive strategies we are supposed to find a

"peaky" shape in the Sharpe's ratio distribution of probabilities. Nonetheless a flat distribution could be associated to a more inefficient market where managers may have the opportunity to beat the passive benchmark by implementing higher activity strategies.

These arguments lead us to suggest as an active strategies measure the following fourth order moment indicator as Group Activity Indicator:

$$GA_g = \frac{\sum_{p=1}^{n}\left(S_p - S_{pp}\right)^4}{(N)GD_g^4} \qquad [2]$$

2.3 - SUCCESSFUL AND UNSUCCESSFUL STRATEGIES

According to the previous settlements in a non- perfectly efficient market, managers are more willing to set active strategies, but according to our theoretical background this inefficiency might not imply necessarily an increase in performance. In fact, in a highly efficient market, managers who would dare to undertake an active strategy should have a worse performance than the passive strategy portfolio, so in an extreme case of perfect efficiency there would not be any observation above the S_{pp}. We could then detect group management goodness by measuring the distribution's skewness from the GA_g.

Having a positive skewness would mean that managers are performing positively so they beat the market. On contrary, negative skewness is an indicator of negatively performing management.

We propose as a management performance measure for a certain group of funds, based on a third order moment, the following Group Management success indicator:

$$GMS_g = \frac{\sum_{p=1}^{n}\left(S_p - S_{pp}\right)^3}{(N)GD_g^3} \qquad [3]$$

3 - DETECTING GOOD MANAGERS

The second objective of this paper is to detect persistence performance for individual funds. Therefore we propose a suitable performance measure that would allow us to order asset funds, not only controlling for the market in which they invest but also adjusting this performance to the level of its persistence. A manager will be a good performer if he succeeds at beating the market, so we propose as a measure of performance the indicator that Fama (1972) named Net Selectivity. The Net Selectivity measures the difference between the return effectively achieved by a fund and the theoretical profitability that would have been obtained according to the CML by undertaking the same level of risk.

$$NS_p = R'_p - \left[i + \frac{R_{pp} - i}{\sigma_{pp}} \sigma_p \right] \qquad [4]$$

Were R'_p is the return from portfolio p, *i* is the free risk asset rate, R_{pp} is the return of the passive portfolio, σ_{pp} is the standard deviation of the passive portfolio's return and σ_p is the standard deviation of portfolio p's return.

We can easily identify good managers from bad ones by the sign of this measure, a positive value of the Net Selectivity means having a mean good performance meaning beating the passive portfolio and a negative value may indicate a lower performance than the benchmark.

3.2 - NON-NORMALITY AND SKILL

According to the NS_p we can rank successful managers in a proper way but we still cannot identify skilled managers from lucky ones. As we base our analysis on the CAPM we approach managerial skill identification as follows: Given that CML can be taken as an explanatory model of portfolio returns, we can assume that NS_p values are the residual values of the following regression model:

$$\tilde{R}'_p = i + \frac{\tilde{R}_{pp} - i}{\sigma_{pp}}\sigma_p + \varepsilon_{NS} \qquad [6]$$

Were $\tilde{R}'_p$ is the portfolio p return random variable, and $\tilde{R}_{PP}$ is the passive portfolio return random variable and ε_{NS} is the random residual corresponding to the Net Selectivity.

According to the assumptions of the CAPM the expected value of this residual should equal zero and have a Gaussian distribution. Therefore if good performers can be identified by finding NS_p mean values different from zero, according to the EMH we could have been observing a not long enough data series so the explanation is just randomness or luck, but if we reject the null hypothesis that a given data sample belongs to a normally distributed population then we could infer some managing skills as a good explanation of abnormal success. In other words, we could determine if they are just lucky or they have some managing skills by looking at the probability that the sample belongs to a Gaussian distributed population. So we propose Shapiro-Wilk test p- results in order to identify skill in good performing managers.

4. DATA AND RESULTS

This research is focused in the Spanish investment funds market, specifically in the whole population of asset investment funds, we take quarterly data from June 1999 to December 2007 (35 trimesters).

We can distinguish seven different categories according to the different markets in which funds are framed. Data has been depurated in order to discard non complete dataset funds.

Annex 1 shows the description of the population under analysis, broken down into the seven different categories giving detailed information about portfolio composition , number of observations per group, number of funds in each category, number of managers and the benchmark portfolio that has been taken as passive portfolio according to each framework market.

The seven resulting categories are:

1- Spanish market

2- Euro

3- Europe Non-Euro

4- USA

5- Japan

6- Emergent Markets

7- Others

It is important to highlight that the only categories that cover the whole period range are 1 and 2 (35 observations) for the rest of the groups datasets start in March 2002 (24 observations.

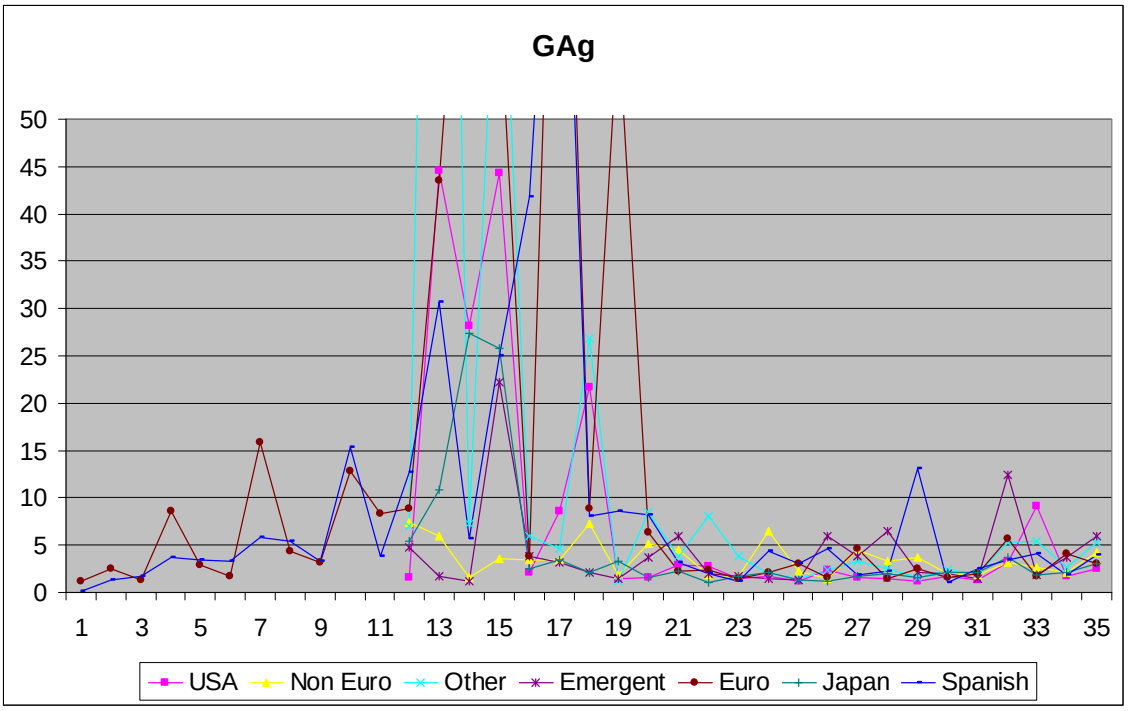
4.1. EFFICIENCY ANALISIS

The first objective of this paper is to determine the level of activity in a given market in order to establish a measure that may allow us to set an operational baseline range of efficiency in each framework market. To do so, we calculate the Sharpe ratios of all funds in each category and compare them with the Sharpe ratio of their corresponding benchmark passive portfolio.

According to these benchmarks we calculate the activity GA_g [2] and success GMS_g [3] indicators proposed in section 2.2. reaching the following results:

We can distinguish two different activity patterns concerning the period between the first trimester 2002 and the first trimester 2004, it seems to be an important decrease of activity during this period, but there is a higher activity level for the previous periods (only measurable for categories 1 and 2) and for the following ones. Graph 1 shows the level of GA_g for the seven categories along the study period where this behavioural differences can be observed.

GRAPH 1



Low activity period (1rst trimester 2002 - 1rst trimester 2004): Where significantly high values of the GA_g indicator can be observed for the majority of groups. This might indicate a high level of passivity in managing strategies that can be related with all the events that shake the markets during 2001 such like the dot com crash and September 11. This post-crisis period can be explained in two ways. We could expect that high enough turbulences in the markets might induce managers to be more conservative in order to content their costumers or to remain faithful to the EMH we could assume that in a high volatility environment investors are more accurate in their valuations, so market efficiency increases and the opportunities to undertake successful strategies tent to disappear.

Operational activity period (2nd trimester 2004 – 4rth trimester 2007): Where lower values of the GA_g indicator show a significant change in managers behaviour indicating a much more active management. This is the level of efficiency (or inefficiency) that we claim to be considered in order to make markets work properly. A T-test has been set to check for significant differences in the mean values between both periods.

Table one shows the t-test results and the average value for each group of the GA_g indicator, the GMS_g indicator and the correlation coefficient between them and the maximum and minimum values for the operational activity period that set the Baseline Efficiency Operational Range (BEOR) for each category.

TABLE 1

Category	*1- Spain*	*2- Euro*	*3-non-Euro*	*4- USA*	*5- Japan*	*6-Emergent*	*7- Others*
T test	**3,1134**	**4,1465**	**1,8629**	**3,1299**	**2,73425**	**0,5168**	**2,1591**
Error	**0,00506*** **	**0,0004218*** **	**0,0759***	**0,00487*** **	**0,01211** **	**0,6104***	**0,042** **
OAP Max GAg	**13,1297**	**5,7068**	**6,5409**	**9,1489**	**3,6540**	**12,4183**	**8,1310**

OAP min GAg	**1,1240**	**1,4186**	**1,4239**	**1,2435**	**1,0969**	**1,3063**	**1,5005**
GMSg mean	**10,518**	**1,420**	**6,890**	**-5,131**	**38,373**	**9,791**	**-2,426**
ρ GAg/GMSg	**-0,118**	**0,004**	**-0,452**	**0,047**	**-0,147**	**-0,137**	**-0,115**

We can distinguish three different levels of statistical significance of the t-test

*****Very High significance:** Groups 1, 2 and 4, these are the categories that show a stronger and significant change, these groups are framed in the markets that bear the higher impact of 2001 markets turbulences. Nevertheless some behavioural important differences can be observed in the GMS_g indicator.

The Spanish and Euro market funds obtained positive average group success results while the USA obtain average negative results. The level of activity has a very low correlation with the success indicator and it is positive for Euro an USA funds but negative for the Spanish ones, so there is no clear pattern to state that more inefficient market situations lead to an increase in managerial success.

****High significance:** Groups 5 and 7, Japanese and Others show a lower impact on activity along the post 2001 period but still they show a significant change in managerial behaviour that turn into more passive strategies during this period. The Japanese funds have a higher mean success than the Others ones though both show a low and negative correlation between GA_g and GMSg which would show that in these markets, managers have a light tendency to be more successful when markets are more inefficient, so the obtain higher performance when inefficiency allows them to undertake active strategies.

***Low significance:** There is no statistical evidence that may allow us to infer any behavioural difference around the 2002-2004 period and the rest of the time series for the rest of the groups. Both groups show a positive value for the GMS_g indicator and a low and negative correlation coefficient that suggests the same tendency observed in the High significance group.

We can observe that BEOR is quite diverse and we can consider it a very idiosyncratic market characteristic. The BEOR is giving us a frame to determine operational margins so by observing it we may infer changes in the level of confidence managers have in the market prices they operate in.

4.2. SKILL GENERATED SUCCESS

As it has been explained in section 3, persistent success might not necessarily be linked with management skills. In order to identify skilled managers from successful ones we have selected the successful funds for each category by picking up the funds with a positive NS_p average value, we have ranked them and tested for their distributions to be Gaussian. In the following table we can see the percentages of successful funds per category, the percentage of successful funds that according to the Shapiro-Wilk test might not be Gaussian and the percentage of the whole group that we cannot discard from having managerial skills.

TABLE 2

Category	*1- Spain*	*2- Euro*	*3-non-Euro*	*4- USA*	*5- Japan*	*6-Emergent*	*7- Others*
% Successful	**98%**	**99%**	**100%**	**43%**	**54%**	**55%**	**48%**

% Skilled	22%	17%	45%	40%	61%	29%	34%
Total	21,56%	16,83%	45,00%	17,20%	32,94%	15,95%	16,32%

As we can see from Table 2 the percentage of potentially skilled managers is substantially reduced while introducing the Shapiro-Wilk filter in all categories.

We can observe that the final percentages are around fifteen and twenty per cent in all groups except number 3 and 5 that have substantially superior level of potentially skilled managers.

5. CONCLUSIONS

The first aim of this paper is to identify whether there is a level of efficiency that can be considered as a baseline operational range of efficiency. We have approached this measurement by using a concentration around the passive benchmark portfolio indicator.

We observe different behavioural patterns of activity that allow us to distinguish between the post 2001 (Dot-com crisis and September 11) and the rest of the periods.

This behavioural differences might be explained as a consequence of managers having lost confidence in market prices, as Brealey-Myers (2003 p.362) state: "….investors almost always price a common stock relative to yesterday's price ……, when investors lose confidence in the benchmark of yesterday's price , there may be a period of confused trading and volatile prices before a new benchmark is established.". This lost of confidence leads to a more accurate pricing which will increase market's efficiency and consequently narrow the range of undertaking successful active strategies. So after a convulsion concerning the framework model of financial markets we might expect the level of efficiency to increase and the number of active strategies to lower.

As a result of this first analysis we would like to highlight the Sharpe's ratio deviation from the passive portfolio third and fourth moment methodological approach. That has allowed us to measure, how active managers are and how successful their strategies are , for each category of Investment Funds set by the data. And moreover has permitted us to set what we have called the Baseline Efficiency Operational Range.

It is important to mention that though we are able to detect good performance, we cannot find any kind of statistically significant correlation between the market level of efficiency and successful management.

The second aim of this paper is to identify good managers. We use the Fama's net selectivity as a success indicator. But according to the EMH the existence of these successful managers is a consequence of having a not long enough data series, so we take the NS_p as the random residual of a regression model resulting from using the CML to explain funds returns. Given that, according to the EMH this residual should have expected value equal to zero and have a Gaussian distribution, so we test for Gaussian distribution of successful funds and we reach the following conclusion: Though there is a high percentage of successful managers during the period of study for all categories, there is an important part of them that might have been successful only by randomness given the results of the gaussianity test we run that don't allow us to reject the null hypothesis for the NS_p to be a $\mathrm{N}(0,\sigma)$ random residual .

According to the results shown by ours analysis, there are some behavioural patterns we detect in the Spanish asset investment funds market that are not coherent with the EMH such as the inconsistent and low correlation between market efficiency and success, or the existence of a percentage of individual successful managers that cannot be discarded as skilled ones, that lead us to consider a more behavioural approach as the Adaptive Market Hypothesis AMH Lo (2004)as a better way to explain managerial behaviour in investment funds markets.

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ANNEX 1

Category 1: Spanish market Asset Funds (Spanish Market)	
Portfolio Composition	Less than 25% invested in fixed income. Max 30% non euro currency More than 90% of the assets must come from Spanish issuers
Number of observations	3841 observations – 199 missing = 3.642 final observations
Number of funds	251
Number of managers	130
Benchmark	IBEX 35 Index
Category 2: Euro market Asset Funds (Euro)	
Portfolio Composition	Less than 25% invested in fixed income. Max 30% non euro currency No more than 90% of the assets must come from Spanish issuers
Number of observations	3708 observations – 342 missing = 3.606 final observations
Number of funds	254
Number of managers	108
Benchmark	SX5E Index (Eurostoxx 50)
Category 3: European market Asset Funds in non Euro currency (Europe non-Euro)	
Portfolio Composition	Less than 25% invested in fixed income. Min 30% non euro currency. At least 75% of the assets must come from European issuers.
Number of observations	1464 observations – 102 missing = 1362 final observations
Number of funds	108
Number of managers	40
Benchmark	SX5E Index Eurostoxx 50
Category 4: USA market Asset Funds (USA)	
Portfolio Composition	Less than 25% invested in fixed income. Min 30% non euro currency. At least 75% of the assets must come from USA issuers.
Number of observations	1030 observations – 63 missing = 967 final observations
Number of funds	73
Number of managers	39
Benchmark	INDU Index Dow Jones
Category 5: Japanese market Asset Funds (Japan)	
Portfolio Composition	Less than 25% invested in fixed income. Min 30% non euro currency. At least 75% of the assets must come from Japanese issuers.
Number of observations	641 observations – 26 missing = 615 final observations
Number of funds	40
Number of managers	32
Benchmark	NKY Index Nikkei

Category 6: Emerging markets Asset Funds (Emerging Markets)	
Portfolio Composition	Less than 25% invested in fixed income. Min 30% non euro currency. At least 75% of the assets must come from Emerging markets issuers.
Number of observations	1163 observations – 89 missing = 1074 final observations
Number of funds	77
Number of managers	38
Benchmark	MXEF Index MSCI Emerging Markets
Category 7: International markets Asset Funds (Others)	
Portfolio Composition	Less than 25% invested in fixed income. Min 30% non euro currency. Not belonging to the rest of International asset funds categories.
Number of observations	4272 observations – 171 missing= 4101 final observations
Number of funds	334
Number of managers	81
Benchmark	MXWO Index MSCI World Index

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