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CLOSED-END FUNDS. MARKET DESCRIPTION AND THE BEHAVIORAL EXPLANATION OF THE DISCOUNT. A REVIEW.

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Abstract

Of the Investment Funds world market that reached US dollars 21,76 trillion at the end of 2006, Closed-End funds cover approximately 4%. The market is captured by the US and EU Investment Funds that cover almost 95% of total assets. Existing since 1868, Closed-End Funds offer most of the advantages of the collective investments, and one threat that can prove to be an important opportunity: The Discount to the Net Asset Value that they usually trade. The discount threat, can lead to superior total returns and this is one of the reasons why this small collective investment market still exists. We focus on the behavioral explanation of the discount puzzle, as it explains also the existence of periods or funds that are sold or trade at prices higher to their NAV. JEL Classifications: G23, L89.

Keywords: Behavioral Finance - Closed-End Funds - Premium/Discount.

1. Introduction

Closed-end funds are companies that invest their equity capital; in some cases they use also debt, in the securities of other corporations and manage these investments for income and profit. Closed-end funds generally do not continuously offer their shares for sale. Rather, they sell a fixed number of shares at one time (in the initial public offering), after which the shares typically trade on a secondary market. Being a corporation though, they can issue new shares for their existing shareholders (rights issue), the public (public offerings) or some specific investors (private placements). However these are done infrequently and the fund's capital structure is closed most of the time. Closed-end funds' shares are listed on securities exchanges where they are traded offering the option to their holders to buy more into them, or liquidate portions of their position. The company can repurchase their own shares in the open market, having taken the decision to do so in a general assembly, although it is a seldom

one as it results in an indirect capital decrease. Closed-end fund shares generally are not redeemable. That is, a closed-end fund is not required to buy its shares back from investors upon request. Some closed-end funds, commonly referred to as interval funds, offer to repurchase their shares at specified intervals. Closed-end funds come in many varieties. They can have different investment objectives, strategies, and investment portfolios. They also can be subject to different risks, volatility, and fees and expenses.

Closed-end funds are subject to registration and regulation with the local capital markets commissions, and are subject to numerous requirements imposed for the protection of investors. As any type of collective investments, they offer investors three main services:

- Portfolio diversification and reduction of unsystematic risk
- Portfolio management in the form of specialist investment knowledge and administrative services, and
- Financial intermediation, by creating a new financial asset that may be more easily marketable than the underlying securities in the portfolio.

A closed-end fund may be diversified and invest its assets in many different stocks or bonds. As a result, the impact on the fund of a change in the price of any one stock or bond holding is diminished. Some funds may be non-diversified. Non-diversified funds may have larger holdings in particular investments. In most cases, however, an investor on his or her own would find it difficult and expensive to construct a portfolio as varied as that of a closed-end fund. A closed-end fund incurs operating expenses associated with fund portfolio management, fund business operations, custody of the fund's assets, and shareholder services. These operating expenses are paid by the fund from its assets before any distributions are made to the investor.

As Brickley, Manaster and Schallheim (1991) report, on average nearly 80 percent of Closed-end funds' assets consisted of actively traded equities with reliable market prices, closed-end funds provide continuous market valuation of their equity. This is called Net Asset Value (NAV) and calculated as the difference between the market value of securities held in the portfolio less all the liabilities. At the same time as the number of shares in the market is fixed, their price is also a function of the supply and demand for the shares traded on the market. As a result they can trade in different prices, higher or lower, to their NAV constructing one of the most puzzling anomalies in finance, which is the

closed-end fund discount. Shares are issued at a premium, representing underwriting fees and set-up costs. Within the next six months of trading (Weiss (1989), Levis and Thomas (1995)), the shares trade at an average discount of 10 percent. There are periods in which the closed-end funds trade at premium to their NAV and upon termination or liquidation of the fund, share price rises and persisting discounts disappear (Brauer (1984), Brickley and Schallehim (1985)). Several attempts have been made to explain the existence of persisting and mean reverting discounts within the rational expectations framework without any significant success. On top of limited explanatory power, traditional theorizing of future tax liabilities, agency costs and liquidity can only explain for the discount side of the puzzle but they cannot account for positive fluctuations. Finally a theory of limited rationality based on the misperceptions of the individual investors that translate into changes in their sentiment offer a behavioral explanation to the existence of discount (Lee, Shleifer and Thaler (1991)).

In this paper we provide an overview of the market at the beginning of 2003 and some descriptive statistics on the market structure. We also review the behavioral explanation theories of the discount.

2. Closed-End Funds Sector

2.1 Assets Size and Country of Origin

The first closed-end fund launched was Foreign & Colonial in 1868. Since then the industry has grown especially during 1980s and 1990s. At the time of writing there are 1397 funds incorporated in 23 countries all over the world (Bloomberg LP (2003)), with total market capitalization of US dollars 469 billion. The total market capitalization of world open-end funds reaches US dollars 11,2 trillion (International Investment Funds Association, Investment Company Institute (2003)). World closed-end funds have a market capitalization that is 4% the total market capitalization of close and open-end funds. Earlier studies focusing on US and UK closed-end fund industry, report the existence of 867 funds with total market capitalization of US dollars 229 billion at the end of 1997 (Dimson and Minio-Kozerski (1998)). It is interesting to note that according to the same paper, although US closed-end funds correspond to fewer than 3% of the total value of US funds (open and closed-end), UK funds cover approximately 25% of the industry. Funds by country of origin are presented in the Table 1.

Italy was not an old player in the closed-end fund market, but since December of 2000 Nextra Sviluppo Immobiliare, the biggest closed-end fund in the

world, was launched which accounts for 29% of world market assets. The fund invests primarily in non-residential real estate and real estate companies, around the world is managed by Nextra Investment Management SGR SpA and is listed in Milan Stock Exchange. Also in 2002 another big closed end fund with market cap of US dollars 32.308 was incepted in Italy. Ducato Venture invests primarily in unquoted securities issued by medium capitalization Italian companies. On the opposite side, the smallest fund in the world with less than US dollars 15.000 of market capitalization, is the Technology and Income Trust Limited, incorporated in the UK. The aim of the fund is to generate high income with potential for capital growth by investing in securities issued by companies involved in the technology sector and corporate bonds and other high yielding securities. The fund's advisor is Aberdeen Asset Managers Ltd and it is listed in the London Stock Exchange. Descriptive statistics of the industry are summarized in Table 2.

The three biggest funds that cover almost 56% of the total market were incepted in 2000 and 2002 and cover real estate all over the world, high grade municipal bonds in the USA and unquoted securities of Italian mid cap companies. When excluded from the analysis, average assets size per fund drops to US dollars 150 million, but the average fund size differs substantially from country to country. For a more in depth understanding of the market asset size structure we include the following frequencies Table 3 and Figure 1.

2.2 Fund Managers

The launches of three big closed-end funds in the previous three years have changed the picture in the managers' context. Traditional fund managers account for small part of the total market for another reason also. Those "big" names like PIMCO, Van Kampen, Morgan Stanley and Merrill Lynch have also focused in the open-end fund management and marketing. Historical names like Foreign and Colonial seize enough but still lower than US Nuveen Asset Management, also a long presence (since 1898) that emphasizes fixed income investing and accounts for almost 6% of the world market. The biggest players in the market now are:

1. Nextra Investment Management SGR. It is an Italian corporation member of the group of Banca Intesa with Euro 104 million in equity capital and 1,7 million clients.

2. Eaton Vance Corp. The company traces its beginning back in 1924 but

formed under this name in 1979. It is recognized as a comprehensive wealth manager and offers also mutual funds.

3. Monte Paschi Asset Management SGR. The company is part of the group MPS Ventures and started operations in 2002. The group is active in international banking with credit specialization, asset management, bancassurance and investment banking. It has equity capital of Euro 117 million and 4,5 million customers.

Tables 4 and 5 summarize the situation in the managers' perspective of the business.

2.3 Years of Interest

The industry started as early as 1868 but achieving evolution and attracting greater public interest needed more than a century. Interest in collective investments in general increased during the 1980s and 1990s. Both number of funds and assets under management increased drastically. Of course the establishment of the biggest ever funds in the years 2000 and 2002, increased the market by 56% only lately, but we believe that it is also important to count the number of funds incepted and the international participation in the industry as well. We can note that during the bull markets of the past twenty years there is an explosion of the closed-end funds. Figures 2 and 3 present the market capitalization of funds as of the end of March 2003, categorized by the inception date of the fund and the number of funds incepted each year form 1919 onwards. Years 2000 and 2002 represent Euros 130 and 133 billion respectively but they stop at the top of the figure for presentation reasons. The next more important year of fund gathering for closed-end funds is 1991 that in current market prices account for Euro 22 billion.

2.4 Market Data: Currency, Dividends, and Expenses

Current market situation at currencies is represented in the currency that the closed-end funds are denominated. Almost 84 percent of the market is traded either at US dollars or Euros and 10 percent in British Pounds as the closed-end fund industry has long history in Great Britain (Table 6). When GB adopts Euro the market would be traded equally between the two main world currencies.

Under the US tax system, closed end funds are required to distribute to shareholders 90 percent of realized capital gains and all dividend and interest income in a given year to qualify for exclusion from corporate tax. In contrast UK closed-end funds are not allowed to distribute any capital gains but they

cannot retain more than 15 percent of dividends received (Dimson and Minio-Kozerski (1998)). Closed-End funds in Greece, pay 0,3% on their NAV as tax and they should distribute all dividend and interest income (after accounting for expenses). They may also distribute any realized capital gains net of any unrealized losses. Although differences exist between countries, in general closed-end funds distribute high dividends as compensation to their shareholders. Especially in periods of decreasing prices, dividend income may represent the main attractiveness to the perspective shareholder. From the 1397 funds in our research, 944 distributed dividends for the previous year and the calculated average dividend yield reached 4,3%. To test the stability of the finding we compared it to those of the sample that have outstanding shares of more than 2 million and after excluding the five top and five bottom dividend yielders. Table 7 summarizes the data.

689 funds representing 30 percent of world assets report on average 1,36% total expense ratio per annum. Expense ratio varies from as low as 0,1% of Schoder Ventures International that invests in an international portfolio of buy-out and development capital funds and has a size of US dollars 400 million, to as high as 7,4% of INVESCO's high yield fund that invests in European high yield bonds and capitalizes US dollars 6,2 million. There is significant difference[1] between the reported expenses and the size of the fund, Figure 4 presents the relation between expense ratio and average fund size and Figure 5 the mean expense ratio of the three percentile groups (small, medium, big). As expected the bigger the fund size the lower the total annual expense ratio of the fund[2].

2.5 The Discount

Unlike regular mutual funds, one cannot buy or sell closed-end funds at a calculated NAV price. Instead he/she purchases shares in the open market just like a stock.

The discount or premium at which a closed-end fund trades is perhaps the single most important factor influencing the decision to invest in it. This opportunity has not escaped takeover artists that have taken over closed-end funds that were selling at a discount.

The market price at which the shares of a closed-end fund trade may be at a premium to the NAV, that is, the shares of the closed-end fund may cost more than its NAV, or at a discount to its NAV, that is, the shares of the closed-end fund may cost less than its NAV.

The above situation forms the most dominant puzzle in the literature regarding the closed-end funds: The discount. The discount is defined from the following formula:

$$\text{Discount} = \frac{\text{Market Price - Net Asset Value}}{\text{Net Asset Value}}$$

We used 1192 funds representing 95,7 percent of total world market that reported Net Asset Values, to calculate the weighted average discount of the market[3].

Consistent with previous researches, (Malkiel (1977), Thompson (1978), Lee, Shleifer and Thaler (1990), Deaves and Krinsky (1994), Dimson and Minio-Kozerski (1998), and Minio-Paluello (1998)) the finding relatively to the average price closed-end funds trade is a discount of 14,8 percent. Although at the higher end of the other studies suggestion, the fact that we calculated the discount on the population as well as the bear situation/trend that is persisting in the international markets during the measurement can account for the difference. When correcting data and excluding the top and bottom five extreme values that discount reaches 15,7 percent which is considered to be relatively stable. The capitalization of the funds now, reaches 95,6 percent of total world market. When adjusting for the number of outstanding shares and exclude all those funds with outstanding shares of less than 2 million (57 funds in total), the discount drops to 12,6 percent and capitalization covered stands at 87,9 percent of total.

3. The Explanation of the Discount

3.1 The Puzzle

The closed-end funds are issued in a fixed number of shares, which are traded on the stock market and can be liquidated through their selling to other investors. The closed-end fund puzzle in a nutshell is that the shares are typically sold at prices not equal to the per share market value of assets the fund holds. This discount problem forms a puzzle that has troubled the financial economist world for quite a long time, and despite the fact that many hypotheses have been developed none of them has fully succeeded in providing an explanation to the empirical facts.

An empirical observation denotes that the closed-end fund shares are typically sold to a premium that usually over exceeds the ten percent of the per share value of the assets hold in the fund, which is the cause of the financial problem. The first attempt to solve this problem was based on a framework of a traditional asset-pricing model. The outcomes of this research have pointed out three factors that are responsible for the discount that appears; the illiquidity of assets, the tax liabilities and the agency costs. Before analyzing these factors we should provide the four stages of the closed-end fund puzzle.

The first stage is the foundation of the fund, at which the fund is priced at a ten percent premium with the intention of raising capital from the new investors to buy securities; according to Weiss (1989) and Peavy (1990), and over time this premium is transformed into a discount. The first point that someone should clarify – which is the first part of the closed-end fund puzzle – is why the investors are interested in buying this premium.

Which brings us to the second stage that should be clarified that is why do the closed-end funds, while beginning with a premium, then get discounted, and according to Weiss (1989) this happens within 120 days counting from the initial day of their trading.

The third stage was set by Anderson (1986) and was the observation that the obtainment of a long position against a fund that bears a large discount brings abnormal positive returns.

The final stage, according to Brauer (1984), is that the fund's share prices rise, while the discounts shrink, at either the termination of the closed-end fund or at "open ending".

According to a publication of Andrei Shleifer in 2001, the illiquidity of assets can be explained in the case the closed-end funds hold substantial blocks of individual securities and the stocks' demand curves form downward slopes, then the realizable proceeds that originate from liquidation can be lower than the reported net asset value.

The tax liabilities of a closed-end fund, that need to be covered in the case the assets of the fund are to be sold, are not reflected on the net asset value of it. As it can be observed, this appreciation method causes an over-valuation of the assets in the fund, thus an over-valuation of the fund itself, but at the same time it generates an equal in amount discount to the fund in the case of its selling.

Finally, as far as the agency costs are concerned, in the case the manage-

ment fees of the fund are in high levels, or in the case the portfolio's future management is expected to perform poorly, then a discount to the closed-end fund can occur, according to Boudreaux (1973).

3.2 The Behavioral Explanation

As traditional economic theories failed to explain fully the closed-end fund puzzle, there was doubt on the existing rationality of investors participating in the market. As a result a second attempt to solve this problem was based on the framework of the investor sentiment hypothesis, by DeLong, Shleifer, Summers and Waldman (1990). In literature Zweig (1973) was the first to mention that discounts might reflect the expectations of individual investors. Several examples of inexplicable premiums exist like that of the Germany fund in 1990 (Hardouvelis, La Porta and Wizman (1994)) and those of First Israel and the Turkish Investment fund in 1993, 1994 (Dimson and Minio-Kozerski (1998)). More recently in 1999-2000 towards the end of the bull market in Greece, most closed-end funds traded at high premiums since June 1999 that reached an average 68,6 percent for the market, in September of the same year. Premiums sustained their existence up to May of the following year and Greek closed-end funds trade at discounts again ever since (Association of Greek Institutional Investors, Monthly Market Statistics (1999-2003)). Dimson and Minio-Kozerski (1998), provide an overview of the behavioral explanations categorizing in the themes of New Issues, Individual Investors and Fluctuations of the Discount. Lee, Shleifer and Thaler (1991) have argued that the discount that is presented in the closed-end fund prices could be explained by the individual sentiment, provided that the individual investors hold the majority of the fund's shares. This is based on the assumption that since the individual investors hold the majority of the fund's shares, as well as of small firms' stocks, they conjecture that their sentiment is what results in the price formation of both the stocks of the fund, as well as those of the small firms'. The empirical evidence supports this hypothesis, but although this covariance between these stocks exists, the matter that should be addressed is whether this covariance originates from the investor sentiment or from economic fundamentals. Further analysis on the matter that was conducted by Swaminathan (1996) has argued that there is a probability that was a rational justification of the covariance of the stocks and that the investor sentiment hypothesis is inconsistent with discounts presented in the UK funds (which follow patterns similar to the US' funds), and concludes that the majority of the UK closed-end fund shares are hold by institutional investors and not by individual investors. Chen, Kan and Miller (1993),

Dimson and Minio-Kozerski (1998), also support the hypothesis of this inconsistency of the investor sentiment towards the UK's fund discounts.

The behavioural financers do not believe that the arguments of the traditional asset pricing models can provide a fully satisfying explanation for the closed-end fund puzzle, and their beliefs tend to support an explanation that lies on the sentiment dimension of the investors, which consists of two sources of risk: the risk of holding a fund's portfolio and the risk of the noise traders' perceptions about the fund's net asset value changes.

Upon the introduction of a closed-end fund to the market, the noise traders are influenced in a favourite way towards the fund, thus they have the intention to buy it, which is exactly what provides a window of opportunity to the arbitragers to make profit by following the next steps.

Firstly, the arbitragers insert assets to the fund, the value of which the noise traders and generally the unsophisticated investors are not aware of, with the intent to make profit from their selling. The favourable view of the fund from the noise traders' perspective that creates their willingness to trade on it can comprise an explanation to the initial premium that is presented in the fund's price.

Secondly, the arbitragers buy the fund back when it reaches a discount and this is explained in the following way. The act of holding a portfolio in a direct way of course bears a risk of some magnitude, but the ability to enter or exit the market when it is called for as the proper move, is provided. On the other hand, the holding of a fund's portfolio in an indirect way (closed-end fund's case) bears an even greater risk when compared to the former case, since the ability to enter or exit the market at any given time is not an option. The arbitragers are not willing to undertake the risk of the latter case and this is the justification of why they buy back the fund only after it has reached a discount.

By expanding this even further, the conjunction of the risk of holding a fund's portfolio, along with the reactions of the arbitragers, changes the noise traders' beliefs, which are reverted from optimism into pessimism as far as the fund's performance is concerned. This pessimism is now reflected into the fund's future expected returns, resulting into a price discount, with a deviation of even grater magnitude than the expected one. This continues as a vicious circle until the announcement of the termination of the closed-end fund. At this point the beliefs of the investors are reverted one more time due to either the liquidation of the fund, or the "open ending" of the fund. The noise trading risk has now vanished and the arbitragers end up with profit.

Although the investor sentiment hypothesis provides an interesting explanation to the closed-end fund discount as well as premium, there are some more researchers that do not confirm it. Ammer (1990) and Abraham, Elan and Marcus (1993) referring to the institutional ownership of UK closed-end funds and bond fund discounts respectively, argue that some basic hypothesis of the limited rationality theory do not seem to exist. However still empirical data provided by several researchers cannot be explained fully by the existing theories of asset pricing and still examples of inexplicable premiums offer grounds for further research.

4. Conclusions

Since the first evidence offered by Zweig (1973) suggesting market investment opportunity, further studies by Thompson (1978), Whiting (1984), Anderson (1986), Cheng, Copeland and O' Hanlon (1994) and Pontiff (1995) provide evidence showing that discounts of closed-end funds can be used to construct profitable trading strategies. This paper has attempted to provide a description of the world market and present some data, which support the existence of a discount, and review the behavioural explanation theories that appear to add power to the explanation of the closed-end fund puzzle. The research of 1192 out of the 1397 funds that exist all over the world suggests that a discount that on average reaches 14,8 percent exists. At the same time dividend offered, yields an interesting 4,3 percent at current prices and average total expense ratio doesn't seem to exceed 1,4 percent although most funds offer diversified strategies. Closed–end funds market is dominated by Europe and US. UK and Italy representing the vast majority of European Union assets cover 48 percent of total market with US covering 46 percent. As a result more than 84 percent of total assets are denominated in US dollars of Euros. Italy is a fairly new player in the market because of the inception of two of the three biggest funds that cover 36 percent of world assets. Traditional and internationally known fund managers account for approximately 11 percent of the market, while the four bigger players cover more than 60 percent. The closed-end fund market exists since 1868 but it has evolved considerably in the last twenty years both in the number of listed funds and total assets. A greater exposure to the individual investors public and a better understanding of the discount puzzle and its fluctuations may result to an even more intense increase of assets and number of new funds in the coming years.

On the explanation of the discount side, several theories attempted to provide evidence within the context of the efficient market hypothesis, but none managed

to account for all the aspects. Investors participate in the Initial Public Offerings of closed-end funds although they sell at premiums; consequently they trade their shares at discount within four to six months of the listing that apparently offers abnormal returns to their secondary market owners and finally prices rise and discount disappear when the closed-end fund liquidates or is "open-ended". That drove a second way of explanation through the hypothesis of investor sentiment influence on market prices of closed-end funds. So far the puzzle hasn't been solved but the literature describes several characteristics of the discount that have been used as factors in models trying to explain substantial proportions of the fluctuation. In several countries (UK, Greece, etc.) the industry has been under scrutiny and there are liquidations, mergers, and absorptions causing several funds to disappear. At the same time we experience new inceptions as well as the establishment of some of the biggest ever funds lately. It seems that closed-end funds meet some perceived needs and that they offer enough advantages to overcome the discount threat. Further research in this area might provide new evidence and new factors explaining both the market and the puzzle.

TABLES & FIGURES

TABLE 1

Fund Assets by Country of Origin

China	7.119,74	1,63%
UK	53.073,79	12,17%
Italy	158.297,32	36,29%
Switzerland	12.471,35	2,86%
US	197.253,99	45,86%
The Rest	7.971,71	1,83%

TABLE 2

NAME	INCEPTION	MCAP $	MCAP €	% TOTAL
BIGGEST				
NEXTRA SVILUPPO IM	1/12/2000	136.327	126.757	29,06
SMALLEST				
TECHNOLOGY & INCOME TR	1/7/1999	0,01	0,01	0,00
MEDIAN				
NUVEEN CONNECTICUT	25/9/2002	63,43	58,98	0,01
AVERAGE				
AVERAGE OF 1397	N/A	335,81	312,23	0,07
THREE BIGGEST FUNDS				
AVERAGE OF 3	N/A	87.389,44	81.254,70	18,62
AVERAGE EXCLUDING THE THREE BIGGEST				
AVERAGE OF 1394	N/A	148,46	138,04	0,03
TOTAL	N/A	469.120,08	436.187,89	100

TABLE 3

FREQUENCIES	No OF FUNDS	AVERAGE ASSETS	% OF TOTAL FUNDS	% OF TOTAL ASSETS
UP TO 1 MLN €	52	0,373	3,72%	0,00%
FROM 1 UPTO 4,99 MLN €	98	2,82	7,02%	0,06%
FROM 5 UPTO 19,99 MLN €	208	11,76	14,89%	0,56%
FROM 20 UPTO 49,99 MLN €	285	34,01	20,40%	2,22%
FROM 50 UPTO 99,99 MLN €	249	71,96	17,82%	4,11%
FROM 100 UPTO 199,99 MLN €	228	143,36	16,32%	7,49%
FROM 200 UPTO 499,99 MLN €	198	311,94	14,17%	14,16%
FROM 500 UPTO 999,99 MLN €	56	673,57	4,01%	8,65%
FROM 1.000 UPTO 2.999,99 MLN €	20	1.495,12	1,43%	6,86%
OVER 3.000 MLN €	3	81.274,71	0,21%	55,90%

FIGURE 1

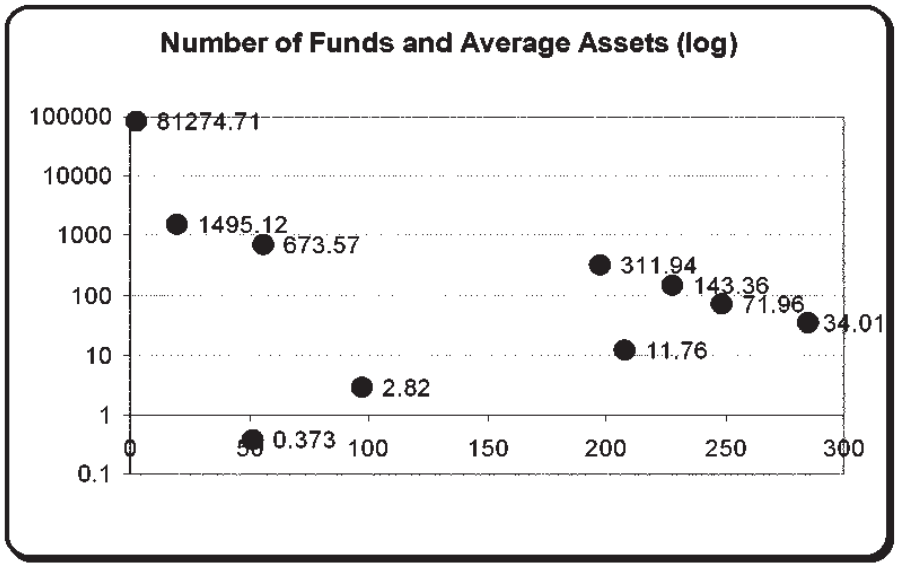


TABLE 4

Assets by Fund Manager		
EATON VANCE	86.967,35	19,94%
MPS Venture SGR SpA	30.040,00	6,89%
Nextra Investment Management SA	126.756,78	29,06%
NUVEEN AM	24.932,12	5,72%
THE REST (*)	167.491,65	38,40%

(*) *Of "the rest", traditional fund managers manage € 47.891,99 million.*

TABLE 5

Assets Managed by Traditional Fund Managers		
Bellevue Asset Management	3.239,33	6,76%
Putnam Investment Management Ltd	3.216,25	6,72%
MORGAN STANLEY	4.036,41	8,43%
Merrill Lynch Investment Management	1.771,46	3,70%
Henderson Investment Limited	2.857,39	5,97%
Templeton Global Advisors Ltd	3.853,62	8,05%
FOREIGN & COLONIAL	6.926,06	14,46%
ALLIANCE AM	2.980,21	6,22%
JPMorgan Fleming Asset Management	3.339,57	6,97%
BLACKROCK AM	6.473,70	13,52%
PIMCO AM	3.673,20	7,67%
VAN KAMPEN AM	5.524,79	11,54%

FIGURE 2

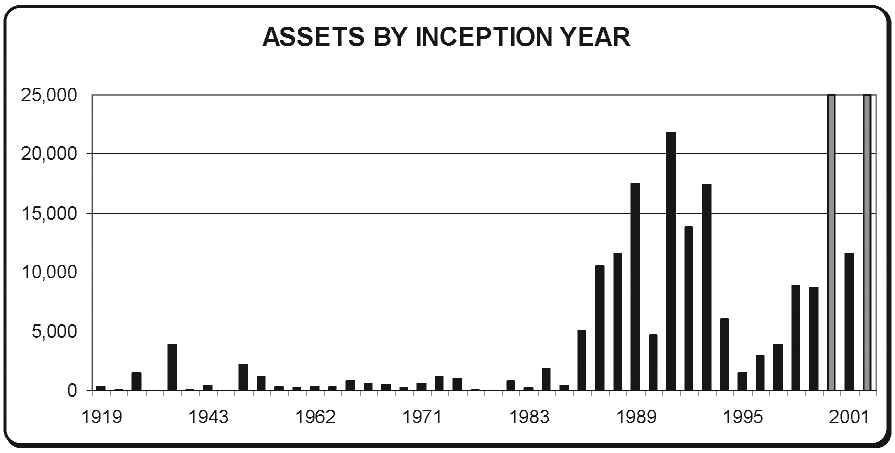


FIGURE 3

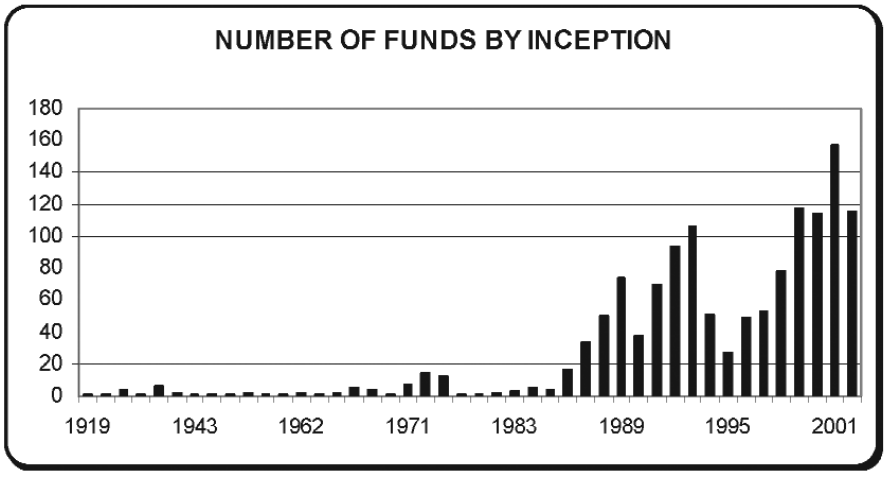


TABLE 6

Assets by Currency		
CHF	8.515,29	1,95%
EUR	167.265,13	38,35%
GBp	43.752,93	10,03%
USD	197.215,70	45,21%
REST 11	19.438,84	4,46%

TABLE 7

No of FUNDS	% OF TOTAL	MCAP $	MCAP €	% OF TOTAL	D/Y
944	67,6	406.693,5	378.143,66	86,7	4,3
828	59,3	402.284,53	374.044,20	85,8	4,3
934	66,9	399.501,06	371.456,12	85,2	4,4

FIGURE 4

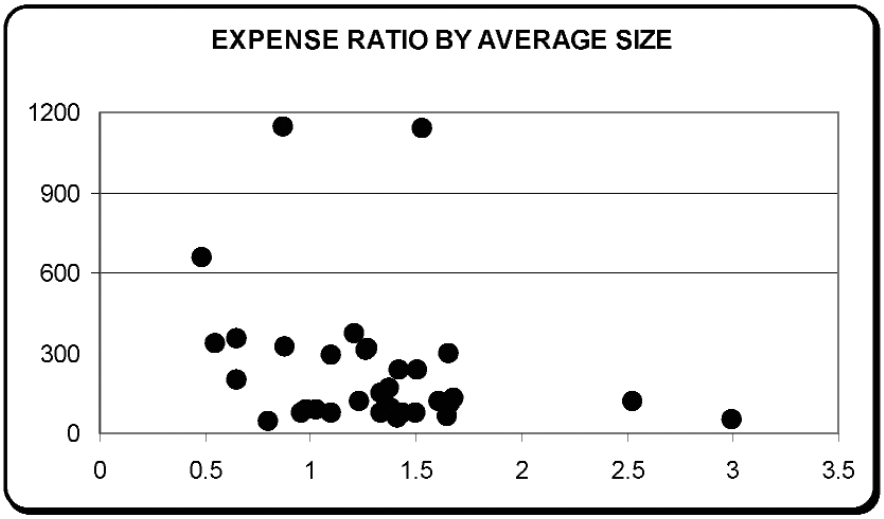
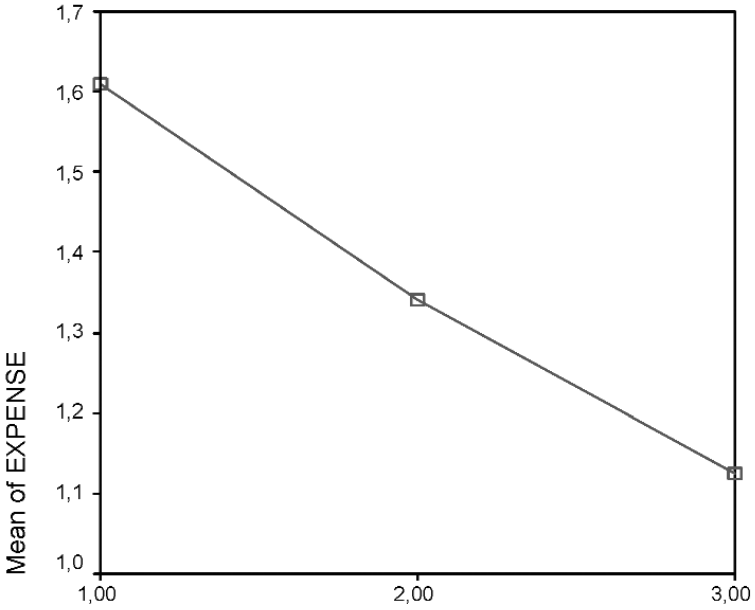


FIGURE 5



End Notes

1. After converting variables to 10 percentiles and performed cross-tabulation, both Chi-Square Tests and Symmetric Measures at significance level of 0,01 rejected hypothesis of independence of the two variables. We also performed ANOVA, converting size variable into three percentiles that rejected the hypotheses of equal means between the three samples at 0,01 significance level. ANOVA results are supported by Levene's test of homogeneity of variances, suggesting that variances between groups do differ significantly. It is worth noting that significant differences occurred between all three groups as reported by multiple comparisons tests of Scheffe, HSD and LSD.

2. Up to €60,99 million, 1,608%. Between €61 and €169,99 million, 1,341%. Above €170 million, 1,125%

3. To calculate the weighted average discount of the market we used data from Bloomberg LP. We first calculated the discount of each fund using the above mentioned formula and then calculated the sum of the multiplication of discount and market capitalization (totaling €–61,8 billion). The result over the total market capitalization (€417 billion) provides the market weighted average discount.

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