PERFORMANCE OF ISRAELI MUTUAL FUNDS: EQUITY AND BOND FUNDS[1]

MENACHEM (MENI) ABUDY, MOSHE BAREL AND AVI WOHL[*]

Abstract

This paper examines the performance of mutual funds in Israel between 2003 and 2008. Almost all of the funds active during all or part of this period were examined. (The following funds were not included in the sample: money market funds, tracking funds, Israeli funds of funds, foreign funds of funds, and "taxable funds".) The funds' performances were examined by comparing them to benchmarks which were built using regressions of the funds' yields as compared with: the CPI-Indexed Government Bonds Index; the Government Shekel Bonds Index; the CPI-Indexed Corporate Bonds Index; the General Shares Index; the MSCI World Index, and the shekel return on dollar-linked interest investments. The funds were grouped according to their classifications into three investment categories, all of which showed annualized underperformance: government bonds – -2.08 percent; corporate bonds – -3.35 percent; non-bond (mostly share) funds – -3.62 percent. Such underperformance, which is statistically significant, was also found when the period was divided into sub-periods. The main reason for the underperformance is the management fees charged by the funds, although underperformance was found even before deducting management fees: government bonds – -0.69 percent; corporate bonds – -1.72 percent; non-bond (mainly share) funds – -1.00 percent. The underperformance before deducting management fees (gross) is not statistically significant. These calculations were made using a simple averaging of fund yields in each investment category. The weighting of the yields according to the funds' market capitalization does not materially change the results. It was found that there is a persistence that is not high in the performance of mutual funds by fund manager—every 1 percent of excess yield between 2003 and 2005 explains about 0.28 percent of the excess yield between 2006 and 2008.

[*] **Abudy**: Graduate School of Business Administration, Bar-Ilan University, menachem.abudy@biu.ac.il. **Barel**: Recanati Business School, Tel Aviv University, barelmoshe@gmail.com. **Wohl**: Recanati Business School, Tel Aviv University, aviwohl@post.tau.ac.il

A. INTRODUCTION

Mutual funds constitute a significant factor in the Israeli capital market. The funds serve as the main vehicle for households to invest in the capital market for investments that are not long-term (as opposed to pension funds, provident funds, study funds, etc.). As of the end of 2010, the number of active funds was 1,250, with approximately NIS 156 billion in assets under management.

A large body of research has been produced worldwide about the performance of mutual funds (mainly in the US) dating to as early as the 1960s. The overall picture emerging from these studies is that mutual funds do not provide their investors with adequate value for the management fees they charge, and, as a result, investors receive underperforming yields as compared with other alternatives embodying similar risk characteristics. Nevertheless, it is unclear whether mutual funds can provide excess returns before management fees are deducted. Examples of up-to-date studies in the US are Kosowski, Timmerman, Wermers and White (2006) and Fama and French (2010).

Edelen (1999) found that US equity funds underperform comparable benchmarks by approximately 1.6 percent. However, he claims that comparison to a market portfolio is unfair, since a mutual fund provides liquidity which is lacking in a passive portfolio. In a liquidity-adjusted comparison, Edelen shows that the funds do not significantly underperform market portfolio, although they do provide somewhat lower yields (-0.2 percent).

Even if mutual funds underperform on average, the question is whether it is possible to identify funds with excess returns that are expected to provide excess returns in the future as well. In other words, is there significant persistence in the funds' performance so that the best performing funds should provide good performance in the future as well? Berk & Green (2004) present a theoretical model according to which the persistence phenomenon should not exist, since funds with excess yields will withdraw funds up to a point at which they can no longer provide excess yields (since investment opportunities with excess yields are limited).

Empirical evidence generally indicates low persistence. For example: Huij & Verbeek (2007) examined the persistence phenomenon among 6,400 US-based funds between 1984 and 2003. The researchers found that the best performing funds continued to produce excess returns of 0.26 percent (net) in the month after they were examined. But persistence was mainly found in young funds and in funds investing in small cap stocks.

There are very few studies of the performance of mutual funds in Israel. The general picture emerging from the most recent studies (Lauterbach and Barak (2002) and Blass (2007)) is that mutual funds underperform relevant comparative indices by at least the management fee rates. Lauterbach and Barak (2002) examined the performance of all flexible mutual funds and all equity mutual funds active in Israel as of the end of 1989, from 1990 to 1996. They found that, according to the Jensen Performance measure, Israeli mutual funds underperform by approximately 3 percent per annum. The underperformance was mainly attributed to the management fees charged by the funds, which—according to the paper—stood at about 2–3 percent per annum during that period. The study found that

the persistence phenomenon did exist: There was a 0.5 correlation between the funds' ratings in consecutive periods (depending on the index according to which they were rated and the periods examined).

In his study, Blass (2007) showed that the 249 mutual funds examined between 1994 and 2005 produced average gross yields (before deduction of management fees) that were lower than the indices to which they were compared. The results of the study show than after deducting the fees, the average yield differences between the funds and their comparative benchmarks is -6.2 percent for the equity funds, -6.6 percent for the flexible funds, and approximately -3.2 percent for the bond funds. Blass found no evidence of persistence in the funds' performance.

This paper examines the performance of mutual funds in Israel between 2003 and 2008. It includes most of the mutual funds active during that period. For reasons outlined below, the funds classified as "taxable", money market funds, tracking funds, Israeli funds of funds and foreign funds of funds were not included in the study. The main contribution of this paper is that, for the first time in Israel, it examines the performance of investment categories (government bonds, corporate bonds and non-bond funds—mostly equity funds) rather than individual funds. In order to calculate the yield of an investment category in a given month, we calculated the average of all the yields of the funds active during that month belonging to that category. We used two averaging methods: A simple average, which gives equal weight to each fund, and a weighted average according to the value of the assets under management for each fund as of the end of the previous month. The weighted average is more reflective of the overall performance of the funds in that investment category. The disadvantage of the weighted average is that investors in funds may reallocate their money across sub-categories (e.g., transfer from Israeli shares to foreign shares) at bad timings. In other words, there is a negative correlation between the flows to the various sub-categories and between the future yields in those flows. [2] If such a correlation exists in Israel, we will see that a weighted yield according to the value of assets will present bad timing and bad performance which does not arise from the fund managers' management capabilities.

The performance evaluation is made based on the monthly yields and—using the alpha model—the performance of the fund categories is compared to the comparative benchmarks built using the following indices: Israel's General Shares Index, the CPI-Indexed Government Bonds Index; the Government Shekel Bonds Index; the CPI-Indexed Corporate Bonds Index; the American monthly T-Bills Index; and the MSCI World Index. The comparative benchmarks were created in a similar way to the way in which Prof. Boudoukh and Prof. Wiener developed their comparative benchmark to examine the performance of provident funds in 2007. [3] Their model, which includes several factors, is a generalization of Jensen's Alpha measure. During the sample period, 2003–2008, the Tel

---

[2] Frazzini and Lamont (2008) show that investors in US-based mutual funds actively reallocate their money across different mutual funds at bad timings.

[3] Please see Boudoukh and Wiener (2007) on the Ministry of Finance's website, at the following address: http://ozar.mof.gov.il/hon/2001/insurance/memos/MADADEY_SIKUN2007.pdf. Also, see explanations on the Gemelnet website, at the following address: http://gemelnet.mof.gov.il

Aviv Stock Exchange (TASE) indices were adjusted to dividend or interest minus tax. Thus, the comparison with these indices creates an advantage for non-taxable funds (tax-exempt funds). For this reason, we adjusted the TASE indices by taking into account all of the dividends and interest paid out and calculated the required adjustment. We examined the yields of the investment categories after deducting management fees (i.e., the net yield for investors) and before deducting management fees ("gross"), with equal weight given to each fund in each investment category (simple average), and with weight given to each fund according to its market cap at the beginning of the month (weighted average). Examining investment categories rather than each individual fund allows us to create comparative benchmarks by using factors and to avoid the survivorship bias problem. Building a comparative model by using factors, as opposed to a simple comparison to a single index according to the fund's classification (e.g., comparing a corporate bond fund to the TASE's Corporate Bonds Index) requires observations of a few years. Thus, if each fund's performance is estimated individually, the funds which have not been active long enough must be eliminated. It is probable that such funds have worse than average performance, thus resulting in a survivability bias. When examining the categories, even a fund which was active for only one month contributes to the yield of that investment category during that month, thus avoiding the survivability bias.

The study found that the mutual funds' underperformance is economically and statistically significant. The annualized alpha of the net yields of government bond funds is -2.08 percent according to a simple average and -1.69 percent according to a weighted average. The "net" alphas in corporate bond funds are even lower: -3.35 percent according to a simple average and -3.78 percent according to a weighted average. In non-bond funds, which are mainly equity funds, the underperformance is -3.62 percent according to a simple average and -5.01 percent according to a weighted average. The underperforming yields are stable over time, and when examining the alphas in the two sub-periods—2003–2005 and 2006–2008—a picture emerges of negative alphas in both sub-periods in all investment categories, with the difference between them being statistically insignificant. The funds' alphas tend to be negative even before management fees are deducted. The gross alpha according to a simple average of the government bond funds is -0.69 percent, -1.72 percent for corporate bonds funds, and -1.00 percent for non-bond funds. According to a weighted average, the gross alphas are -0.69 percent, -2.27 percent, and -2.34 percent, respectively. Contrary to the net alphas, the difference between the gross alphas of the non-bond funds and zero is statistically insignificant. It is clear that the funds provide investors with net underperformance, with the main reason being the management fees. The underperformance before deducting management fees, which are not high (at least in government bonds and non-bond funds) can be explained, at least in part, by the fact that mutual funds provide clients with liquidity (see Edelen, 1999).

As mentioned above, the main reason for the funds' underperformance is the management fees. In 2003–2005, the annual average management fees (according to a simple average) were 1.23 percent in government bond funds, 1.62 percent in corporate bonds funds, and 2.53 percent in non-bond funds. In 2006–2008 there was an increase of 1–7 percent in the average management fee rates in each investment category, which stood

at 1.32 percent, 1.63 percent and 2.71 percent, respectively. By weighted average, the increase was even greater: between 9 percent and 14 percent. A possible explanation for the increase in management fees is the implementation of the Bachar Reform. The performance of the funds before deducting management fees was improved between the periods by a statistically insignificant rate, and overall the net yields did not change by a statistically significant rate.

Similar to the manner of calculating the yields of the investment categories, we calculated the yield for each "family" of funds (i.e., for each fund manager, such as Psagot), according to a simple average of all the funds of that "family" that were active in a given month. We examined the persistence in the performance of fund "families" which were fully active from 2003 to 2008. We found that there was a modest persistence in the performance of mutual fund "families": Every 1 percent of excess yield ("alpha") between 2003 and 2005 before (after) deducting management fees explains about 0.28 percent (0.25 percent) of the excess yield before (after) deducting management fees between 2006 and 2008.[4]

Chapter B describes the research method and data, Chapter C outlines the manner in which the performance indicators were created, Chapter D outlines the results, and Chapter E summarizes the study.

B. THE RESEARCH METHOD AND DATA

a. The Data

For the study, data were purchased from Praedicta on all mutual funds registered in Israel between January 1, 2003 and December 31, 2008.

The data include:
- Each fund's serial number and name.
- The date on which the fund was established and the last date on which it operated.
- The serial number and name of the investment category to which each fund belongs.
- The fund's tax classification (tax exempt or taxable).
- The name of the financial institution which owns the fund and its serial number.
- Each fund's monthly management fee rates. Since we had no data regarding trustee fees, we added 0.004 percent to the annual management fees as the estimated trustee fees. The monthly management fees do not include an added fee which is not imposed by all funds and is transaction-based rather than time-based.
- Each fund's monthly and annual market capitalization.
- Each fund's monthly yields, adjusted for dividends.

---

[4] There is indeed a survivorship bias in fund families which were active throughout the period, but in this case, we examine consistency rather than performance, so it seems that the problem is insignificant.

The group name, the tax classification and the institution which owns the fund are the last of the data. The data may have changed during the period, but we have no information about that. In addition, we obtained from Praedicta the monthly yields of the following indices in the sampled period: the General Shares Index, the CPI-Indexed Government Bonds Index, the Unindexed Government Bonds Index, and the CPI-Indexed Corporate Bonds Index. Another data set obtained from Praedicta was of the annualized monthly yields of the US government's T-Bills. In order to adjust the yields of this index so that it can be compared to the shekel yields of the other indices, the shekel/dollar exchange rates for each month were examined, and the index's yields were adjusted to shekel yields according to the change in the exchange rate of the dollar.

The Tel Aviv Stock Exchange provided us with data regarding all of the interest payments and dividends distributed by the shares and bonds traded on the TASE between January 1, 2003 and December 31, 2008, as well as the individual tax rate attributed to each share and bond. In addition, data were received (they may also be found on the TASE's website) regarding net monthly issuances between 2003 and 2008 in the following fund groups: shares (including flexible shares), bonds, shekel bonds, and foreign bonds.

Annualized data regarding the exchange rate of the dollar and the Bank of Israel interest rate between January 2003 and December 2008 were taken from the Bank of Israel's website. The data used in the model were calculated on a monthly basis.

We also used yields on the MSCI World Index taken from www.mscibarra.com. This MSCI World Index is a weighted index capturing equity performance across 24 developed markets.[5] The index yields were standardized against the shekel.

b. Tax Standardization of the TASE's Indices

In this paper, we adjust the chosen reference indices which are published by the TASE (the General Shares Index, the CPI-Indexed Government Bonds Index, the Unindexed Government Bonds Index, and the CPI-Indexed Corporate Bonds Index) to taxation.

These indices' yields, which were published by the TASE during the period through December 31, 2008, are the dividend/interest adjusted yields less individual tax, i.e., the yields of the indices less taxes on interest (in the case of bonds) or dividends (in the case of shares).

Since this paper focuses on "tax exempt" mutual funds (see below), which are non-taxable (see more information in the next paragraph), the funds should be adjusted for the yields on TASE indices so as to produce an adequate comparison with the mutual funds' yields. We add to the yields of the TASE indices the "tax component", so that the presented yield rates of the indices are the yields before tax deduction.

Several changes took place in the tax classification of mutual funds during the sampling period. As of January 1, 2003, the funds were classified into three groups for tax purposes:

---

[5] As of March 2011, the markets included in the index were: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Israel, Ireland, Japan, the Netherlands, Italy, New Zealand, the US, the UK, Spain, Portugal, Singapore, Switzerland, Norway and Sweden.

1. Tax exempt fund—a fund the revenues of which are not taxable, so that the investor is the one to pay tax on capital gains.
2. Taxable fund—a fund which pays tax directly to the government according to a fixed rate per individual, so that the investor is exempt from paying capital gains tax or dividend tax.
3. Mixed fund—the revenues of such funds from tradable securities and interest on deposits are not taxable, but the fund pays tax for its revenues from dividends, interest and real capital gains from foreign securities, but only for taxable income with a tax rate higher than 15 percent, and only for the difference. Investors in this fund pay a 15 percent tax on their real capital gains.

As of January 1, 2006, the "mixed fund" classification was revoked, and all of the "mixed" funds became "tax exempt" funds. Currently, funds are only classified as either tax exempt or taxable.

We shall only deal with the tax exempt funds, and shall exclude from our sample taxable funds, since there is no way of assessing the capital gains tax paid by these funds (since we do not have information regarding the taking of profits/losses in each security held by each mutual fund). In addition, the number of taxable funds is relatively small (about 7.5 percent of all funds in 2008).

We shall also deal with all of the funds the last tax classification of which was "tax exempt" as if they were tax exempt in 2003–2005 as well, despite the fact that some were classified as "mixed" during that period. The reason for this is that we have no data regarding the classification history of these funds for tax purposes. It should be noted that treating all of the funds which are currently tax exempt as if they were exempt throughout the sampling period results in a downward bias of the funds' performance between 2003 and 2005. It seems to us that this is not a serious problem, since it pertains only to some of the funds, which, in fact, paid partial tax only (in effect, mainly for foreign securities and for the difference, starting from 15 percent only), so that we have no way of quantifying this assessment. This problem is non-existent since January 1, 2006, the date on which the "mixed fund" classification was revoked.[6]

The tax adjustment of the TASE indices was done by multiplying the individual tax rate for each stock or bond by the dividend or interest distributed on a given date, adding up all of the said amounts for all of the stocks or bonds under that index and calculating the percentage of that amount out of the market capitalization of the relevant index, and finally adding that percentage to the index's yields in the relevant month.

For example, if in the General Shares Index in a certain month only two of the stocks were active, one distributing a NIS 10 million dividend and the other a NIS 20 million

---

[6] In addition, at the beginning of 2004, some mutual funds went from being classified as "taxable" to being classified as either "tax exempt" or "mixed". As stated, we have no information regarding historical tax classification. It seems that there is no significant bias in treating these funds as tax exempt since this pertains only to 2003, and most of these funds' investments are bonds and *makam* (short-term loans), which were tax exempt during that year. Please see a document by CPA Avi Noiman from Kesselman & Kesselman PriceWaterhouseCoopers Israel: http://www.pwc.com/he_IL/il/tax/assets/shok_c.pdf.

dividend, the individual tax rate of the first stock would be 10 percent and of the second one, 20 percent; the market capitalization of the stocks at the beginning of that month was NIS 100 million and NIS 500 million, respectively, and the General Shares Index's yield as published that month was 5 percent. After standardization for tax, that index's yield is:

$$R_{NEW} = 5\% + \frac{10M * 10\% + 20M * 20\%}{100M + 500M} = 5.83\%$$

The following are the average annual adjustments for the various indices in 2003–2008: General Shares Index—0.74 percent; CPI-Indexed Government Bonds Index—1.09 percent; Unindexed Government Bonds Index—0.74 percent; CPI-Indexed Corporate Bonds Index—0.96 percent.

c. Mutual Funds Characteristics

Table 1 outlines the value of assets under management in mutual funds in Israel, by asset type.

Table 1
Assets under management by mutual funds in Israel, as of year's end, 2002–2008,
(NIS million) [7]

Year	Total assets under management by mutual funds	CPI-Indexed bonds	Forex-linked bonds	Foreign – shares and bonds	Convertible shares and securities	Future domestic financial assets	Unindexed bonds
2002	45,840	2,601	5,628	6,542	3,876	132	27,061
2003	83,162	5,492	4,749	10,493	8,246	187	53,995
2004	101,101	8,854	4,732	13,127	13,142	151	61,075
2005	124,621	22,538	6,518	20,361	16,618	123	58,464
2006	111,467	23,168	5,099	19,403	19,609	-47	44,235
2007	120,321	35,748	4,986	15,963	18,935	-13	44,703
2008	98,099	19,147	2,893	5,947	4,901	-262	65,472

The table does not include the weight of corporate bonds in the bond funds. As of the end of 2008, corporate bonds accounted for approximately 30 percent of the value of all bond funds.[8]

---

[7] From the Bank of Israel's website.
[8] The calculation is based on Table 12a from the Bank of Israel's website.

This paper includes most of the mutual funds registered in Israel in 2003–2008. The following funds were not included in the sample:

1. Funds classified as "taxable".[9]

2. The first money market funds—shekel and forex—were established at the end of 2007, and funds defined as "tracking funds": In this paper, we would like to examine funds with an "active" rather than "passive" investment policy.

3. Four funds classified as "Israeli fund of funds", and 5 funds classified as "foreign fund of funds". Such funds invest in other mutual funds.

4. Other funds left out were those for which there were no yield data in the Praedicta database during the sampling period.

A total of 1,104 funds, managed by 40 "families"—fund managing entities—were included in the sample.

Table 2 outlines the market cap of the funds in the sample in relation to the total market cap of mutual funds in Israel.

Table 2
Market cap of mutual funds in the sample in relation to that of all mutual funds' in Israel during the sampling period[10]

Month and year	12/03	12/04	12/05	12/06	12/07	12/08
Market cap of all Israeli mutual funds	83,162	101,101	124,621	111,467	120,321	98,099
Market cap of sample funds	57,868	74,423	99,580	94,770	109,282	62,018
Market cap ratio	70%	74%	80%	85%	91%	63%

* Market cap in NIS millions.

In 2008, a significant decline emerges in the relative portion of the sample funds' market cap out of the total market cap: From 91 percent in 2007 to 63 percent. The decline is mostly the result of money market funds entering the market that year. As of the end of the year, these funds were valued at NIS 32.6 billion.

d. Descriptive Statistics

Table 3 outlines statistical data for the monthly yields of the various investment categories in the mutual funds.

---

[9] See explanation in Section B.2.
[10] The total market cap data for mutual funds in Israel were taken from the Bank of Israel's website.

Table 3
Monthly yields (%) of mutual funds by investment category, 2003–2008

	N	MEAN	STD	MIN	MAX
Simple average					
Government bonds	72	0.44	1.05	-3.46	3.05
Corporate bonds	72	0.12	1.69	-6.75	3.00
Non-bond	72	0.47	4.95	-19.28	10.58
Weighted average					
Government bonds	72	0.45	0.67	-1.64	2.50
Corporate bonds	72	0.00	1.61	-8.15	1.95
Non-bond	72	0.35	5.18	-20.50	10.36

Table 4 outlines statistical data for the monthly management fees in the various investment categories in the mutual funds.

Table 4
Monthly management fees (%) in mutual funds by investment category, 2003–2008

	N	MEAN	STD	MIN	MAX
Simple average					
Government bonds	72	0.106	0.005	0.096	0.116
Corporate bonds	72	0.135	0.006	0.122	0.144
Non-bond	72	0.218	0.009	0.195	0.229
Weighted average					
Government bonds	72	0.083	0.006	0.075	0.092
Corporate bonds	72	0.125	0.009	0.107	0.138
Non-bond	72	0.222	0.010	0.202	0.234

As stated in Section B.1, the management fees include an estimate of trustee fees and do not include an additional fee, charged by some funds, which is transaction-based rather than time-based.

Table 5 outlines statistical data of monthly yields of indices used to create the monthly comparison indices in the various investment categories in the mutual funds.

Table 5
Monthly yields (%) of various indices, 2003–2008

	N	MEAN	STD	MIN	MAX
General Shares Index	72	0.94	5.35	-17.48	13.28
CPI-Indexed government bonds	72	0.66	1.15	-3.32	5.71
Unindexed government bonds	72	0.72	0.94	-1.23	3.97
CPI-Indexed corporate bonds	72	0.36	1.89	-11.02	3.42
USD investments	72	-0.05	2.55	-5.58	10.66
MSCI World Index	72	0.19	3.86	-15.79	6.57
Bank of Israel interest rate	72	0.39	0.12	0.21	0.74

C. CREATING THE PERFORMANCE INDICES

For every investment category (government bonds, corporate bonds, non-bonds) we built a set of monthly yields, net and gross (before management fees) using a simple average (each fund receives equal weight) and according to a weighted average according to the market cap of each fund as of the end of the previous month. A simple average gives an indication of the performance of an investor naively allocating his money across the funds. The weighted average gives an indication of the aggregate performance in each investment category. The classification is performed based on the classification of the mutual funds by the TASE, which includes 53 classifications. Appendix 1 features the adjustment we made between these 53 classifications and our three classifications.

The following regression is estimated for each data set:

$$R_t^{funds} - R_t^{free} = \alpha + \sum_{i=1}^{I} \beta_i (R_t^{risk-factor-i} - R_t^{free}) + \varepsilon_t$$

where:

R_t^{funds} – The channel's monthly yield in month t.

R_t^{free} – the risk-free interest rate—Bank of Israel interest in month t.

$R_t^{risk-factor-i}$ – the yield of index i on month t.

We use six indices:
1. The CPI-Indexed Government Bonds Index.
2. The Government Shekel Bonds Index.
3. The CPI-Indexed Corporate Bonds Index.
4. The General Shares Index.
5. The MSCI Index - index of global equity investment performance. The index we used is MSCI World Index, adjusted for shekel returns.
6. Investment in dollar interest (T-Bills interest translated into shekel yields).

The α (alpha) of the regression is an indicator of excess yields. This index is a generalization of the Jensen measure to various factors, and is a generalization in the spirit of the model published by Prof. Jacob Boudoukh and Prof. Zvi Wiener in the Gemelnet website, for assessing the performance of provident funds and study funds (http://gemelnet.mof.gov.il). The betas created by this regression seem reasonable, and are outlined in Appendix 2.

We examined various models for estimating the alpha: a regular estimate over the sampling period, an estimate to which we also added the explanatory variables with a lag of one month (since there was a positive serial correlation in the yields of the fund categories, probably due to nonsynchronous trading), and an estimate in which we enabled various betas in 2003–2005 and 2006–2008.[11]

---

[11] When the yields of the investment category are by a simple average, F tests for the differences between the betas in the various sub-periods show a lack of significance (the p-values are 0.43 in the government

D. THE FUNDS' PERFORMANCE

a. The Mutual Funds' Performance

As stated above, we examined various models for estimating the alpha: a regular estimate over the sampling period, an estimate to which we also added the explanatory variables with a lag of one month, and an estimate in which we enabled various betas in 2003–2005 and 2006–2008. The results we received were qualitatively consistent across the three models. In presenting the results, we will focus on the basic model. In all of the models, the R^2 is very high, a fact which indicates that when mutual funds are grouped into investment categories, one gets a portfolio which is explained, to a great extent, by the factors. Thus, the alphas can be estimated using a relatively small estimation variance. In all of the regressions we ran, we verified—using the Godfrey test—that there was no significant first order serial correlation (at a 0.05 significance level) among the residuals. In these data, which include no seasonality, it seemed unlikely that we would not find a first order serial correlation and there was a serial correlation of a higher order. Table 6 sums the alphas found in the various models (multiplication of the monthly alphas found by 12).

Table 6
The Mutual Funds' Performance

Model	Simple average			Weighted average		
	Annualized alpha	t-stat	R^2	Annualized alpha	t-stat	R^2
Government bond funds						
Net	-2.08%	-6.71	0.97	-1.69%	-8.50	0.96
Net various coefficients	-1.73%	-4.92	0.97	-1.55%	-8.83	0.98
Net with lagged variables	-2.32%	-8.11	0.98	-1.78%	-8.67	0.97
Gross	-0.69%	-2.13	0.96	-0.69%	-3.49	0.96
Gross various coefficients	-0.44%	-1.26	0.97	-0.54%	-3.02	0.98
Corporate bond funds						
Net	-3.35%	-4.39	0.92	-3.78%	-3.75	0.85
Net various coefficients	-3.17%	-3.64	0.92	-2.62%	-2.78	0.90
Net with lagged variables	-3.83%	-5.10	0.94	-3.63%	-3.34	0.86
Gross	-1.72%	-2.26	0.92	-2.27%	-2.24	0.85
Gross various coefficients	-1.54%	-1.76	0.92	-1.09%	-1.15	0.90
Non-bond funds						
Net	-3.62%	-2.32	0.96	-5.01%	-3.06	0.96
Net various coefficients	-3.03%	-1.81	0.97	-3.63%	-2.14	0.97
Net with late variables	-3.92%	-2.48	0.97	-4.92%	-2.86	0.97
Gross	-1.00%	-0.64	0.96	-2.34%	-1.43	0.96
Gross various coefficients	-0.40%	-0.24	0.97	-0.94%	-0.56	0.97

bond funds, 0.71 in the corporate bonds and 0.07 in the non-bonds). When the calculation is based on a weighted average, F tests for the differences between the betas in the various sub-periods provide significant results, with a significance level of 0.05.

It is evident from Table 6 that the three investment categories have highly significant net underperformance. According to a simple average, the net alphas of the government bond funds, are -2.08 percent, the corporate bonds funds are -3.35 percent, and the non-bond funds are -3.62 percent. According to a weighted average, the results are qualitatively similar, and the alphas are -1.69 percent, -3.78 percent, and -5.01 percent, respectively. All the alphas are highly significant when the t-statistics range between -2.32 and -8.50.

The meaning of the explained high variance in the regressions is that the residuals are small, so that there are no months with abnormal return beyond the model. For example, in the basic model (net yields, simple average), the minimal residuals are -0.64 percent for government bond funds, -1.53 percent for corporate bonds funds, and -1.73 percent, for non-bond funds. The maximum residuals are 0.51 percent, 0.97 percent and 1.79 percent, respectively.

The negative alphas do not arise from abnormal returns in certain months, and in particular, the estimate of the net alphas is stable in the 2003–2005 and 2006–2008 sub-periods. We estimated a model which allows for various betas in the various periods and a dummy variable for the second period. In this way, we, in fact, estimated various regressions in the various periods, with the secant of the second period serving as the secant of the regression in addition to the dummy variable. The dummy variable's t-statistic gives an indication of the significance of the difference in the secant. According to a simple average, the net annualized alphas in 2003–2005 and 2006–2008 were as follows:

In government bond funds: -1.59 percent in 2003–2005 and -1.83 percent in 2006–2008. The t-statistic for the difference is 0.34.

In corporate bonds funds: -1.94 percent in 2003–2005 and -3.71 percent in 2006–2008. The t-statistic for the difference is 0.90.

In the non-bond funds: -2.96 percent in 2003–2005 and -2.31 percent in 2006–2008. The t-statistic for the difference is 0.19.

The main reason for the underperformance is the management fees, which are 1.27 percent in the government bond funds, 1.62 percent in the corporate bonds funds, and 2.62 percent the non-bond funds, according to a simple average, . According to a weighted average, the management fees are 1.00 percent, 1.50 percent and 2.66 percent, respectively. According to a simple average, the gross alphas of the government bond funds are -0.69 percent, the corporate bonds funds are -1.72 percent and the non-bond funds are -1.00 percent. According to a weighted average, the results are qualitatively similar, and the alphas are -0.69 percent, -2.27 percent, and -2.34 percent, respectively. If the management fees are deducted from the gross alphas, the results are somewhat different. The reasons for the minute differences are rounding errors and the fact that the betas are re-estimated in the model with the gross yields and are therefore somewhat different than in the estimate with the net yields. In government bond funds and corporate bond funds the negative gross alphas are statistically significant when the t-statistics range between -2.13 and -3.49. In the non-bond funds, the gross alphas are not statistically significant.

A possible explanation (at least a partial one) for the underperformance even before deducting management fees is the costs of providing clients with liquidity (see Edelen, 1999). The models in the microstructure range, which are backed by numerous empirical

studies (see, for example, a survey by De Jong and Rindi from 2009) show that buying/selling securities should result in a temporary price increase or decrease, depending on the stock's liquidity level. Thus, when a fund is required to buy or sell securities, due to originations or redemptions, it tends to "buy high" and "sell low". In order to examine this subject in detail, the redemptions and originations must be examined at the individual fund level and on a daily basis, which is outside the scope of this paper.

However, there are indications of a correlation between the underperformance and providing liquidity that may be seen in the relation between the performance and the originations and redemptions in the aggregate level. An examination of net yields by weighted average shows that the residuals of the model are **negatively** correlated to the absolute value of the net issuances for the bond funds (according to the TASE's classification in this context). When running regressions in which the explanatory variable is the absolute value of the net issuances for the bond funds and the dependent variable is the residual of the channel's yield vs. the factors, the following correlations are obtained:

In the government bonds funds $R^2=0.131$ and the p-value is 0.0018.

In the corporate bonds funds $R^2=0.132$ and the p-value is 0.0017.

In the non-bond funds $R^2=0.075$ and the p-value is 0.0204.

The p-values show that the correlations are significant. The correlations between the residuals of the various investment categories (government bonds—corporate bonds, government bonds—non-bond, corporate bonds—non-bond) are high (between 0.68 and 0.77).

Surprisingly, the residuals of the non-bond funds are explained by net issuances for the bond funds rather than by net issuances for the equity funds.

b. The Impact of the Bachar Reform on Mutual Funds Performance

The Bachar Reform in the Israeli capital market was implemented following the conclusions of the Bachar Committee. The purpose of the reform was to reduce the centralized role of the banking system in the capital market. As part of the reform, the banks were obliged to sell the provident funds and mutual funds under their management within four years. The potential buyers were insurance companies, investment companies and funds, entrepreneurs and private investment entities. However, when the Reform went into effect (in October 2005), the banks sold most of the funds to insurance companies and foreign investment funds within the first few months.

We compared the management fees and performance of the funds in 2003–2005 and 2006–2008. It should be noted that differences between the periods may stem from many factors, and are not **necessarily** the result of the Bachar Reform.

Table 7 presents the management fees by sub-period, and clear increases are evident in all investment categories. According to a simple average, there was a 1–7 percent increase in the average percentage of management fees in the various categories. By weighted average, the increase was even greater: between 9 percent and 14 percent.

Table 7
Management fees in the various investment categories, by sub-period

	Simple average				Weighted average			
	2003–2005	2006–2008	Difference	Relative increase	2003–2005	2006–2008	Difference	Relative increase
Government bonds	1.23%	1.32%	0.09%	7%	0.93%	1.06%	0.13%	14%
Corporate bonds	1.62%	1.63%	0.01%	1%	1.41%	1.59%	0.18%	13%
Non-bond	2.53%	2.71%	0.18%	7%	2.55%	2.77%	0.22%	9%

As stated in Section D.1, despite the differences in the average management fees, no significant differences were found in the performance in the various periods.

c. Persistence in the Performance of Fund "Families"

In this paper, we examine performance persistence at the fund "family" level, i.e. – funds managed by the same entity, such as Psagot. We examine whether performance in one period can predict performance in the following one. Thirty fund "families" were active throughout the entire period from 2003 to 2008. Focusing on these funds involves a certain survivorship bias, but since at this stage we are interested in examining the persistence phenomenon rather than the performance level, there seems to be no problem with that. Similar to calculating the yields of the investment categories, we calculated the monthly yield by using a simple average of gross and net yields of all the funds of each "family" active during that month. Following that, we calculated the alpha, similar to the manner in which we calculated the alpha for the three investment categories in each of the two periods—2003–2005 and 2006–2008. Since each period includes only 36 months, in order to decrease the number of explanatory variables, we calculated the alpha using the "simple" model, without any lagged variables. After that, we ran a regression with each fund manager constituting an observation, the explanatory variable is the monthly alpha during the first period—2003–2005 and the dependent variable is the monthly alpha in the second period—2006–2008. Two fund "families" were excluded from this calculation (Nova Star and Lamashkia), since they had small amounts under management and featured irregular yields accompanied by high standard deviations.

The results of the gross yields were as follows:

$$\alpha_{2006-8} = -0.016 + 0.277 * \alpha_{2003-5} + \varepsilon \qquad , R^2 = 0.101, \quad N = 28$$
$$(-0.603) \quad (0.099)$$

with the p-values of the bi-lateral test listed in parentheses under the equation. There is a positive correlation, albeit of borderline significance, between the gross alphas in the different periods: 1 percent in the first period explains 0.28 percent in the following

period.[12] It should be noted that during these years, many fund managers changed ownership as a result of the Bachar Reform, a fact which most likely reduced consistency.

There was a similar correlation between the net yields as well, although a somewhat weaker one than between the gross alphas:

$$\alpha_{2006-8} = -0.153 + 0.254 * \alpha_{2003-5} + \varepsilon \qquad , R^2 = 0.081, \quad N = 28$$
$$(0.001) \quad (0.142)$$

E. CONCLUSION

Mutual funds are a key factor in the Israeli capital market. As of the end of 2008, mutual funds had about NIS 100 billion under management, and as of September 2011, the amount stands at about NIS 148 billion.[13] Mutual funds are a popular investment category, due to their advantages over other investment categories: relative liquidity, risk diversification, professionalism and economics of scale. In this paper, we sought to examine the performance of the Israeli mutual funds from a new angle—all of the mutual funds in a certain investment category (government bonds, corporate bonds, and non-bond funds).

This paper includes 1104 funds active in Israel between 2003 and 2008. The sample includes most of the mutual fund industry in Israel. Only the following funds were excluded from the sample: funds classified as "taxable", money market funds, tracking funds and funds of funds (funds holding other funds). We grouped the funds by investment category: government bonds, corporate bonds and non-bond funds (mostly equity funds). Performance was assessed using an alpha model in relation to the monthly yields of some reference indices: the CPI-Indexed Government Bonds Index, the Unindexed Government Bonds Index, the CPI-Indexed Corporate Bonds Index, the General Shares Index, the MSCI World Index, and the Dollar-Interest Investment Index (the T-Bills interest rate translated into a shekel yield). Using these indices, we created benchmarks for comparison.

Table 8 lists the annual alphas of the various investment categories, and statistically significant results with significance of at least 0.05 (in a bi-lateral t test) are underlined.

Table 8
The Mutual Funds' Performance

	Weighted average			Simple average		
	Non-bond	Corporate bonds	Government bonds	Non-bond	Corporate bonds	Government bonds
Net alphas	-5.01%	-3.78%	-1.69%	-3.62%	-3.35%	-2.08%
Gross alphas	-2.34%	-2.27%	-0.69%	-1.00%	-1.72%	-0.69%

---

[12] There was no significant difference between the consistency following a negative or positive alpha. It may be that the number of observations was small and insufficient for this type of test.
[13] From the Bank of Israel's website: http://www.bankisrael.gov.il/data/p85.htm.

Table 8 shows that the mutual funds significantly underperform the comparable benchmarks in every investment category, both according to the calculation of the average yield by simple average and according to a weighted average by market capitalization. This underperformance is stable across time. For each sub-period of 2003–2005 and 2006–2008, we found net negative alphas in each investment category.

Even when examining the funds' performances before deducting management fees, we see that the mutual funds underperform the benchmark indices in any cross-section. However, this underperformance is statistically significant only in government bond funds and corporate bond funds. This underperformance before deducting management fees may be explained, at least in part, by underperformance caused by providing clients with liquidity (see Edelen, 1999). For this reason, it cannot be said that fund managers as a whole fail at managing investments, but it can be said that management fees result in clients receiving significant underperformance. These results are generally consistent with results all over the world as well as with previous studies on the Israeli market (Lauterbach and Barak, 2002; and Blass, 2007, who found even worse underperformance).

We examined the performance consistency at the mutual fund family level (i.e., all the funds of a fund manager as one). We found some consistency: A 1 percent difference in the alphas of fund managers in 2003–2005 is related to a 0.28 percent difference in the alphas of 2006–2008. This result is also generally consistent with the results of testing consistency of mutual funds' performance around the world and in Israel (Lauterbach and Barak, 2002). The result in inconsistent with Blass (2007), who, as aforesaid, examined consistence at the fund level rather than the fund "family" level. It should be noted that it is possible that the change of ownership in many funds following the Bachar Reform reduced performance consistency.

The conclusion of this paper is that mutual funds do not provide yields which compensate for the management fees they charge. Possible explanations for the extensive investment in mutual funds are as follows:

- Investors regard mutual funds as professional money managers specializing in diverse investment areas. The funds also invest significant resources in marketing and advertising.
- Despite the fact that, as a group, mutual funds do not provide adequate consideration for the management fees they charge, at any given time there are funds which surpass the reference benchmark. Although it is not clear whether they can repeat this performance in the future, the public is drawn to these funds.
- Many investors are unaware of the comparison of the funds' performance to that of other indices. Funds which provide positive yields over time may be sufficient for investors, even if they provide underperformance in comparison with parallel risk indicators.
- Buy/sell fees—when purchasing securities (stocks or bonds), ETNs or tracker funds, the client pays buy/sell fees. Thus, even if investors are aware of the difference between the fund yields and the indices, funds may be a better choice in the short term.
- Liquidity—funds enable indirect investment in low-volume securities.

APPENDICES

APPENDIX 1
MUTUAL FUND CLASSIFICATIONS

Fund classification according to the Tel Aviv Stock Exchange	Investment category classification
Local bonds - shekel bonds - general	Government bonds
Local bonds - government - general	Government bonds
Local bonds - government - CPI-Indexed - other	Government bonds
Local bonds - government - CPI-Indexed - long-term + 4	Government bonds
Local bonds - government - CPI-Indexed - mid-term 2-4	Government bonds
Local bonds - government - CPI-Indexed - short-term up to 2	Government bonds
Local bonds - shekel only - other	Government bonds
Local bonds - shekel only - long-term + 2	Government bonds
Local bonds - shekel only - mid-term + 1-2	Government bonds
Local bonds - shekel only - short-term up to one year	Government bonds
Money market fund - money shekel fund	Government bonds
Local bonds - other - corporate and convertible - high-risk	Corporate bonds
Local bonds - other - corporate and convertible - other corporate and convertible	Corporate bonds
Local bonds - other - general	Corporate bonds
Local bonds - other - foreign currency - local USD	Corporate bonds
Local bonds - other - foreign currency - other foreign currency	Corporate bonds
Foreign bonds - EUR bonds	Corporate bonds
Foreign bonds - USD bonds	Corporate bonds
Foreign bonds - general foreign bonds	Corporate bonds
For foreign residents only - foreign resident bonds	Corporate bonds
Money market fund - foreign currency money market fund - EUR	Corporate bonds
Money market fund - foreign currency money market fund - USD	Corporate bonds
Foreign funds of funds	Non-bond
Israeli funds of funds	Non-bond
Flexible	Non-bond
For foreign residents only - foreign resident bonds	Non-bond
Leveraged and strategic - non-leveraged strategic	Non-bond
Leveraged and strategic - other leveraged	Non-bond
Leveraged and strategic - high-risk leveraged	Non-bond

Local shares - Share Index - Yeter	Non-bond
Local shares - Share Index - other local shares index	Non-bond
Local shares - Share Index - TA 100	Non-bond
Local shares - Share Index - TA 25	Non-bond
Local shares - Share Index - TA 75	Non-bond
Local shares - shares general	Non-bond
Local shares - shares by industry - real estate	Non-bond
Foreign shares - shares by industry - other industries	Non-bond
Foreign shares - by industry - "environmental"	Non-bond
Foreign shares - by industry - energy and commodities	Non-bond
Foreign shares - by industry - biotech and pharma	Non-bond
Foreign shares - by industry - technology	Non-bond
Foreign shares - by industry - other industries, foreign	Non-bond
Foreign shares - equity index - other foreign share index	Non-bond
Foreign shares - equity index - NASDAQ	Non-bond
Foreign shares - shares by region - Europe	Non-bond
Foreign shares - shares by region - Asia	Non-bond
Foreign shares - shares by region - US	Non-bond
Foreign shares - shares by region - foreign, other	Non-bond
Foreign shares - shares by region - Japan	Non-bond
Foreign shares - shares by region - China	Non-bond
Foreign shares - shares by region - emerging markets	Non-bond
Foreign shares - general foreign shares	Non-bond
Mixed	Non-bond

APPENDIX 2

Betas of the Yields of the Various Investment Categories

The table details the betas against the factors of the yields of the various investment categories (simple average). The number which appears opposite the Bank of Israel interest rate is 1 minus the sum of the numbers.

	Government bond funds	Corporate bond funds	Non-bond funds
The CPI-Indexed Government Bonds Index	0.236	-0.024	-0.236
The Government Shekel Bonds Index	0.379	0.061	0.215
The CPI-Indexed Corporate Bonds Index	-0.028	0.359	0.156
The General Shares Index	0.093	0.135	0.661
The MSCI Index	0.089	0.129	0.375
USD interest	0.011	0.126	-0.154
Bank of Israel interest rate	0.22	0.213	-0.017

REFERENCES

Boudoukh, J. and Z. Wiener (2007), "Indices for Assessing Investment Risks and Performances in Long-Term Savings Channels" (in Hebrew). Appears on the Israel Ministry of Finance's website:
http://ozar.mof.gov.il/hon/2001/insurance/memos/MADADEY_SIKUN2007.pdf

Blass, A. (2007), ""Pulling the Provident Funds and Mutual Funds out of the Banks" (in Hebrew), *Israel Economic Quarterly* 54 (3–4) (331–356).

Lauterbach B. and R. Barak (2002), "Mutual Funds in Israel: Yield and Risk Rates" (in Hebrew), *Israel Economic Quarterly* 49 (3), 515–533.

Berk J. B. and R.C. Green (2004), "Mutual Fund Flows and Performance in Rational Markets", *Journal of Political Economy* 112(6), 1269–1295.

De Jong F. and B. Rindi (2009), *The Microstructure of Financial Markets*, Cambridge University Press.

Edelen R.M. (1999), "Investor Flows and the Assessed Performance of Open-End Mutual Funds", *Journal of Financial Economics* 53, 439–466.

Fama E. and K. French (2010), "Luck versus Skill in the Cross Section of Mutual Fund α Estimates", *Journal of Finance* 65, 1915–1947.

Frazzini A. and O. Lamont (2008), "Dumb Money: Mutual Fund Flows and the Cross-section of Stock Returns", *Journal of Financial Economics* 88, 299–322.

Huij J. and M. Verbeek (2007), "Cross-sectional Learning and Short-run Persistence in Mutual Fund Performance", *Journal of Banking and Finance* 31, 973–997.

Kosowski R., A. Timmermann, R. Wermers, and H. White (2006), "Can Mutual Fund 'Stars' Really Pick Stocks? New Evidence from a Bootstrap Analysis", *Journal of Finance* 61, 2551–2595.