Do Fund Managers Expect Mean Averting Returns?

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Discussion paper No. 309
December 2004
ISSN 0949-9962

Abstract

This paper finds that fund managers do not expect mean reverting returns, as suggested by theory and empirical evidence, but mean averting returns. The degree of mean aversion is positively related to preferences for non-fundamental information and loss aversion.

Key words: Mean aversion; return expectations; non-fundamental information; loss aversion

JEL classification: G12; G14

1. Introduction

Return expectations are the main input in asset allocation decisions and are also at the core of many theoretical models like the capital asset pricing model (CAPM). Despite its importance in theory and practice, stock return expectations can vary significantly among professionals as Welch (2000) documented in a survey with 226 academic financial economists. We extend Welch's approach by asking for expectations on long-term earnings growth in addition to expected stock returns. In 2003 we surveyed 183 German fund managers. The simultaneous analysis of both kinds of expectations reveals on average mean averting return expectations. This finding is difficult to explain in a rational framework.

The paper is organized as follows. Section 2 describes the relation between return expectations and the dividend discount model. Section 3 derives our hypothesis. Results are presented in Section 4. Section 5 concludes the paper.

2. Expected returns and the dividend discount model

Assuming constant growth rates of dividends, g, and constant valuation levels, measured by the dividend-price ratio, $dp_0=d_1/p_0$, the dividend discount model serves as a basis to predict future stock returns. Then, the estimator for the expected stock return equals

$$r = dp_0 + g\,. \tag{1}$$

Varying valuation levels (between t=0 and t=T) change the expected return, r, to[1]

$$r \approx dp_0 + \left(\frac{dp_0}{dp_T}\right)^{1/T} \cdot (1+g) - 1\,. \tag{2}$$

This leads to three different scenarios for the development of the dividend-price ratio. First, the dividend-price ratio is expected to remain *constant*. This is the case when investors perceive the current valuation level as fundamentally appropriate. Second, the dividend-price

[1] For details, see Appendix. Additionally, varying dividend growth rates can also be considered in the dividend discount model (e.g., Claus and Thomas, 2001). However, it seems to be a difficult task to estimate dividend growth rates for a broad stock market in periods far away from today (t>1) (e.g. Cochrane, 1997). Therefore, (1) serves as a basis for estimating long-term expected returns for a broad stock market index.

ratio reverts to a normal level (which can be proxied, for example, by the historical average, dp_{avg}). The *mean reversion* property can be observed when either the current dividend-price ratio is low and the ratio is expected to rise ($dp_0<dp_{avg}$ and $dp_0/dp_T<1$) or the current dividend-price ratio is high and the ratio is expected to fall ($dp_0>dp_{avg}$ and $dp_0/dp_T>1$). Over- and undervaluation are expected to diminish. Third, the dividend-price ratio *averts from the mean* when either the current dividend price ratio is low and is expected to fall further ($dp_0<dp_{avg}$ and $dp_0/dp_T>1$) or the ratio is high and is expected to rise further ($dp_0>dp_{avg}$ and $dp_0/dp_T<1$). In this third case, overvalued stocks are expected to get more overvalued and undervalued stocks are expected to increase their undervaluation.

From a rational and empirical perspective, mean reverting returns seem to be most plausible. Long-term mean aversion would result in continuously rising or falling levels of dividend price ratios which are unsustainable. Empirically, results of Fama and French (1988) or Poterba and Summers (1988) support the mean reversion hypothesis.

3. Questionnaire and hypothesis

Our analysis is based on a questionnaire survey which took place between April and June 2003. The sample consists of 183 responding German fund managers.[2] They forecasted two key variables in four different regions (Germany, Europe excluding Germany, US, and Asia): First, the expected rate of return for stocks in the long-term[3], denoted by r^e_j, and second, the long-term growth rate of earnings, denoted by g^e_j. We did not ask directly for dividend growth estimates because pre-tests have shown that fund managers are more concerned with earnings growth than with dividend growth. We then assume, that the expected long-term growth rate of earnings equals the long term-growth rate of dividends. With this assumption, g^e_j also equals the expected long-term growth rate of dividends.

[2] The full sample of 263 respondents is quite representative for the German market (see Lütje and Menkhoff, 2004, for details). The participants in the sub-sample answering the specific questions here are somewhat younger than the average. This difference does not matter for the analyses here (see also end of Section 4).
[3] Long-term refers to a horizon of T=10 years.

When fund managers expect no change in valuation they form their return expectation according to (1). Then, it follows from (2), that positive (negative) deviations from (1) indicate an increasing (decreasing) valuation level. The corresponding difference for a specific fund manager j is

$$r^e{}_j - \underbrace{(dy_0 \cdot (1+g^e{}_j)}_{dp^e{}_{0,j}} + g^e{}_j) \quad \begin{cases} <0, \text{decreasing valuation level} \\ =0, \text{no change in valuation level}, \\ >0, \text{increasing valuation level} \end{cases}$$

where $dy_0=d_0/p_0$ is the current dividend-yield assumed to be known by all fund managers. Then, $dy_0 \cdot (1+g^e{}_j)=dp^e{}_{0,j}$ approximates the expected dividend-price ratio in the next year, which we do not explicitly ask for. The average deviation of all fund managers is calculated as

$$DEV_{DDM} = \frac{1}{N}\sum_{j=1}^{N}\left[r^e{}_j - \left(dy_0 \cdot (1+g^e{}_j) + g^e{}_j \right) \right].$$

When fund managers consider changing valuation levels, DEV_{DDM} should deviate from zero. A plausible value for the mean to which the current dividend yield, dy_0, is expected to revert, is the unconditional dividend yield (i.e. historical average of dividend yields, dy_{avg}[4]). If stocks are undervalued ($dy_0/dy_{avg}>1$), valuation levels are expected to rise. Consequently, $DEV_{DDM}>0$ should hold. If stocks are overvalued ($dy_0/dy_{avg}<1$), valuation levels should fall and $DEV_{DDM}<0$ should hold. Therefore, we test the following hypothesis:

H_0: Fund managers consider the mean reversion property of expected returns: $DEV_{DDM}<(>)0$ if $dy_0/dy_{avg}<(>)1$.

[4] dy_{avg} is calculated as the historical average of the observed dividend yield of the last 30 years. Dividend yields are taken from Datastream Total Market Indexes of the respective region. Varying the time period (e.g. 15 years) does not change our conclusions significantly. Only in the case of the US, a short time period of less than 10 years (which is significantly influenced by the stock market bubble at the end of the 1990s) lowers dy_{avg} to a value close to dy_0.

4. Results

The upper part of Table 1 displays the average deviation of all fund managers from (1). For Germany and Europe, DEV_{DDM} is negative while for the US and Asia, DEV_{DDM} is significantly positive. These results indicate that fund managers implicitly assume that valuation levels change within the next ten years in the four investigated regions.

>>> Insert Table 1 about here <<<

If the dividend yield is below the average value, $dy_0/dy_{avg}<1$, mean reversion implies a negative DEV_{DDM} (and reverse). For Germany, Europe and the US, fund managers do not expect mean reverting but mean averting dividend yields over the next 10 years. Only in Asia, fund managers anticipate mean reverting returns. However, the current dividend yield is expected to revert to a very low average level of 1.42%. This average level is significantly influenced by the Japanese stock market. In the 1980s, Japan experienced a stock market bubble with high prices, and in the 1990s, it suffered from a long depression with low dividends. Calculation of the average dividend yield in Asia without Japan yields a value of 2.98% which is more in line with the world average of 2.87%. Thus, assuming the more reasonable average of 2.98%, Asian dividend yields also seem to mean avert. As a result, hypothesis H_0 is neither supported by our responses in the case of Germany, Europe and the US, nor by Asia excluding Japan. Fund managers implicitly assume mean averting returns instead of mean reverting returns.

The lower part of Table 1 displays the dividend yields in 10 years implicitly assumed by fund managers when making forecasts on returns and earnings. The expected dividend yield in T=10 years, dy_T, is calculated as follows. Dividends are expected to grow with the average of fund managers expected growth rate: $d_T=d_0\cdot(1+g^e)^{10}$. The expected price increase is approximated by the average of fund managers expected stock return less the dividend yield: $p_T=p_0\cdot(1+r^e-dy_0)^{10}$. Then, the expected dividend yield in T=10 years is $dy_T=d_T/p_T$. For Germany, Europe and the US, current dividend yields avert from their historical average while

Asia reverts to a low level or averts from the average level calculated without Japan. Additionally, for all regions, current valuation levels avert from the world average. Figure 1 displays these results graphically.

>>> Insert Figure 1 about here <<<

We also distinguish among different groups and characteristics of fund managers but mostly results do not change significantly and, therefore, are not reported here. We find, however, that the higher the degree of mean aversion is, the more are fund managers oriented towards other market players and the less they care about fundamentals (Table 2). Moreover, the expectation of mean aversion is positively linked with a higher loss aversion. Hence, we argue that our finding of mean averting return expectations is substantiated by investor characteristics which are compatible with herding.

>>> Insert Table 2 about here <<<

5. Conclusions

This paper investigates long-term return expectations of a broad sample of German fund managers. We find that expectations about stock returns and expectations about the underlying earnings growth diverge. This results in expected mean averting returns which contradicts empirical evidence and rational arguments that long-term returns are mean reverting. In particular, German and European stocks which at the moment are traded at a low valuation level are expected to become cheaper. Asian and US stocks, by contrast, are valued at a high level, but fund managers are expecting that these stocks become even more expensive. Therefore, they seem to extrapolate the past too far into the future. These expectations are hardly to be considered rational. This observation is substantiated by systematic relations between mean aversion and herding characteristics of fund managers.

Appendix

The definition of the dividend-price ratio, $dp_t=d_{t+1}/p_t$, gives $dp_0=d_1/p_0$, and $dp_1=d_2/p_1$. Solving for p_0 and p_1, respectively, and replacing both in

$$r = \frac{p_1 + d_1}{p_0} - 1$$

yields

$$r = dp_0 + \frac{dp_0}{dp_1} \cdot \frac{d_2}{d_1} - 1 .$$

Assuming that the dividend growth from t=1 to t=2 with rate g, $d_2=d_1 \cdot (1+g)$, yields

$$r = dp_0 + \frac{dp_0}{dp_1} \cdot (1+g) - 1 .$$

Extending the forecast horizon from t=1 to t=T, r can be approximated by

$$r \approx dp_0 + \left(\frac{dp_0}{dp_T} \right)^{1/T} \cdot (1+g) - 1 . \qquad (2)$$

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Table 1 Current, average and expected dividend-price ratios and average deviations from the dividend discount model

		Germany	*Europe*	*US*	*Asia*	*Asia (ex Japan)*
DEV_{DDM} [1]	average deviation of managers	-0.366**	-0.397**	1.065***	2.336***	-
Dy_0/dy_{avg} [2]		1.29	1.08	0.54	1.34	0.64
Dy_0 [2]	current dividend yield	3.42%	3.69%	1.84%	1.90%	-
dy_{avg}	historical average dividend yield	2.65%	3.66%	3.38%	1.42%	2.98%
dy_T	(in T=10 years)	3.57%	3.77%	1.65%	1.53%	-
Number of fund managers		182	183	183	152	-

[1] Test of H_0: DEV_{DDM}=0. Stars refer to level of significance: ** 5%, *** 1%
[2] The current date (t=0) refers to end of March, 2003, as most responses occurred during April

Table 2 Mean aversion, preferred sources of information and loss aversion

Request:	"Please assess the following sources of information used in making investment decision?" Six response categories, ranging from "no relevance" to "highest relevance".		
Sources of relevant information			
	Investment decisions of other market players	0.253*** [1]	(0.001) [182]
	Fundamental facts about the company and market	-0.165** [1]	(0.026) [182]
Statement:	"In case of loss positions in my portfolio I generally wait for a price rebound instead of selling those securities." Six response categories, ranging from "completely disagree" to "completely agree".		
Higher loss aversion		0.233*** [1]	(0.002) [179]

[1] The number gives the coefficient of the Spearman rank correlation with degree of mean aversion; p-value in parentheses and the number of responses in squared brackets. The degree of mean aversion is defined as cumulated mean aversion in Germany, Europe and the United States (Asia is neglected due to the unclear interpretation). Stars refer to level of significance: ** 5%, *** 1%
In addition, stronger expectation of mean aversion has also significantly positive correlation with "discussions and exchange of views with colleagues". Further sources of information, such as "chart analysis and technical indicators" or "statements of opinion leaders" have no significant correlation with expected mean aversion.

Figure 1 Current, average and expected dividend yields in T=10 years