

Enclosure

Norges Bank's assessment of the theoretical and empirical basis for active management and our strategy for the management of the Government Pension Fund Global

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1.1 Efficient markets

1.1.1 *The efficient market hypothesis*

The efficient market hypothesis has figured prominently in academic finance for about 40 years [Samuelson (1965), Fama (1965, 1970)]. Fama defined an efficient market as a market where the price of a security always reflects all available information. The hypothesis assumes that rational, profit-seeking market participants will ensure that all relevant information is discounted so that all arbitrage opportunities are eliminated. This means that it will be impossible for an investor to generate a risk-adjusted excess return in an efficient market.

In practice, there will be costs associated with obtaining and analysing information. For rational, profit-seeking market participants to want to discount new information, there must therefore be sufficient profit opportunities in the market for them to be able to cover their costs. The paradox that efficient markets depend on there being investors who attempt to exploit inefficiencies in these markets was first pointed out by Grossman and Stiglitz (1980). The efficient market hypothesis has subsequently been modified [Fama (1991)]. The modern efficient market hypothesis argues that financial markets are close to efficient most of the time, and that active management is necessary to eliminate mispricings and pull markets back towards efficiency.

Black (1986) paints a stylised picture of financial markets where there are two types of participants: informed and uninformed. Informed investors trade on the basis of perceived mispricings, where observed market prices depart from fundamental value. Uninformed investors are participants who trade for other reasons. For example, these may be investors who have an immediate need for liquidity and are therefore willing to pay a premium to complete a trade quickly. Black notes that there is a need for both types of investor in order for financial markets to function. If everybody shared the same opinions, nobody would trade. Differences in opinion create inefficiency, and this, in turn, is the basis for trading. In this model, informed investors will be able to make money from active management by exploiting mispricings created by other investors. Earnings from active management can therefore be seen as compensation for informed investors for identifying inefficiencies in the markets and trading accordingly. In a simple model like this, the choice between active and passive management will be a question of whether we wish to make informed investment decisions ourselves based on perceptions of the fundamental value of securities, or compensate other managers for doing this.

Since Grossman and Stiglitz pointed out the significance of management costs for the efficient market hypothesis, a number of other studies have helped to increase understanding of how financial markets function under more realistic assumptions than those underlying the efficient market hypothesis. Arbitrage plays a key role in the efficient market hypothesis, as this is the market mechanism which helps to pull market prices back towards fundamental values.

Recent research has identified several factors that can place limitations on the extent of arbitrage, which may lead to the persistence of inefficiencies over time [De Long et al. (1990), Shleifer and Vishny (1997)]. First, arbitrage will, in practice, be risky. For an active investor, there will, as a rule, be uncertainty about whether a suspected mispricing is real. In addition, an element of uninformed investors in the market will mean that even real mispricings may increase before they diminish. As arbitrage is often performed by investors with a short investment horizon, this risk could mean that total arbitrage positions are smaller than is necessary to eliminate inefficiencies. Second, arbitrage will, in practice, be capital-intensive. Financing constraints may therefore result in these positions being too small to eliminate mispricings. Active managers who attempt to generate excess return by exploiting inefficiencies often manage capital on behalf of others. A mispricing which increases in the short term will result in a short-term loss for the manager. Although this leads to higher expected returns from the investment, it may in this situation be difficult to induce investors to increase the amount of capital under management. Rather, a manager who incurs a short-term loss will tend to find that investors withdraw capital, meaning that the manager has to close the position. In isolation, this will serve to amplify the mispricing that the manager was originally attempting to exploit. A limited capacity to increase, or at least maintain, the size of positions in situations where inefficiencies in the market are particularly great may cause mispricings to persist over time. In light of this, a manager with a long investment horizon and high risk-bearing capacity could have an advantage in exploiting inefficiencies in the markets.

The assumption that mispricings in the markets will rapidly be eliminated presupposes that investors have a long time horizon and can tolerate substantial losses in the short term. In practice, however, a high proportion of participants in financial markets have a relatively short investment horizon and a high degree of short-term loss aversion. This is due partly to the possibility of redemptions in open-ended mutual funds, to capital adequacy rules for pension funds and insurers, and to many funds having leveraged positions. There are a number of studies which shed light on how short-term investors affect price formation in financial markets. A high number of short-term investors will lead to strong competition for short-term investment opportunities. In practice, arbitrage of short-term mispricings will be less risky and less demanding to finance and execute than arbitrage of securities that may remain mispriced over a longer period. In this sense, it could be said that long-term arbitrage is more expensive

than short-term arbitrage. Shleifer and Vishny (1990) show that, in equilibrium, the expected net return from short-term and long-term arbitrage must be the same. This means that, in equilibrium, the degree of inefficiency and expected return associated with long-term mispricings must be greater than for short-term mispricings. The potential for generating excess return may therefore be greater for an investor concentrating on long-term investment opportunities.

In the model developed by Grossman and Stiglitz (1980), an investor will be rewarded for identifying mispricings, but the more investors who possess the same information, the smaller the return associated with obtaining and analysing new information will be. Based on such a model, where investors have a long horizon, it will therefore be worth concentrating on information regarding the fundamental value of a company that few others possess. In contrast, Froot, Scharfstein and Stein (1992) show how an element of short-term investors in the market can focus on the same subset of the available information, and that this tendency can lead to price formation in the short term that is affected by information that is of little relevance to the fundamental value of a company. An informed investor with a short investment horizon will be able to benefit from his information only if the information he possesses is priced into the market within his horizon. Such an investor is therefore dependent on other investors trading on the basis of the same information that he possesses. A short-term investor will consequently have an incentive to use the same information as other short-term investors and to obtain rapid access to that information.

Modern financial theory acknowledges that the degree of efficiency can vary both over time and between market segments. How efficient a market is will depend partly on the numbers of informed and uninformed investors and on the costs and risks associated with identifying and eliminating mispricings. Against this background, it can be argued that the equity market for small and medium-sized companies and financial markets in emerging economies are less efficient than, for example, the equity market for large US companies. Barberis, Shleifer and Wurgler (2003) argue that the segmentation of markets and investors can have an impact on the pricing of securities, in addition to the underlying fundamental values. Investors have a tendency to group securities in various ways, for example by geography, index, or some other form of classification. Many investors also concentrate on a smaller selection of securities than are investable globally, due partly to transaction costs, trading restrictions and limited information. Inefficiencies may therefore arise in different segments of the market. Combined with limited opportunities to eliminate mispricing, this can result in inefficiencies across different market segments which can be exploited by a long-term investor with a broad global mandate.

1.1.2 Challenges to the efficient market hypothesis

Empirical studies of market efficiency largely explore whether it is possible to generate excess return by trading on the basis of available information. It is common to differentiate between three forms of efficiency: weak, semi-strong, and strong. The difference between them depends partly on how the concept of available information is defined [Roberts (1967)]. Weak-form efficiency means that all historical price information is reflected in the market, eliminating the possibility of generating excess return through trading strategies based on price history. With semi-strong-form efficiency, all publicly available information will be discounted, whereas a strong-form efficient market will also reflect information that is not available to all market participants.

Any empirical test of the efficient market hypothesis should examine whether a given excess return is solely compensation for additional risk. Only in cases where an investment strategy generates a risk-adjusted excess return after costs will the efficient market hypothesis be contradicted. The analysis should be performed using a model that specifies the relationship between return and risk. Any test of the efficient market hypothesis will therefore be a combined test of both market efficiency and the model specifying the relationship between return and risk. If a given investment strategy appears to generate a risk-adjusted excess return, this may be because the market is indeed inefficient, or because the pricing model has been incorrectly specified. As it is impossible to rule out the possibility of the pricing model not taking sufficient account of all aspects of the risk associated with a particular strategy, the efficient market hypothesis can never be rejected [Campbell, Lo and MacKinlay (1997)].

Over the past 30 years, a number of studies based on historical data have documented various investment strategies which generate a return over and above that which can be explained by traditional asset pricing models and are therefore often referred to as anomalies. Researchers in academic finance interpret anomalies differently and can generally be divided into two camps. The efficiency theorists assume that participants in financial markets behave rationally, and that pricing in the market is efficient. They therefore argue that anomalies represent compensation for risk associated with the investment strategy which is not captured by the asset pricing model used. It has also been claimed that some of these anomalies are not robust and could well be a result of random variations in the data [Black (1993), Fama (1998)]. In the other camp, the behavioural theorists argue that investors have a tendency, in a number of areas, to depart from the assumed rational behaviour underlying the efficient market hypothesis, and that opportunities to eliminate any mispricings in the markets are often limited in practice. The behavioural theorists believe that, together, this can explain how inefficiencies can arise and persist for a period of time. Several of the documented anomalies therefore support the conclusions drawn from research into behavioural finance [Shleifer (2000)].

The Capital Asset Pricing Model (CAPM) was developed in the mid-1960s [Sharpe (1964), Lintner (1965), Mossin (1966)] and was the dominant asset pricing model through the early 1990s. According to the CAPM, the expected return on an equity over and above the risk-free interest rate will depend on the risk premium for equities and the equity's covariance with the market portfolio, normally referred to as beta. In this model, the equity's beta is the relevant measure of risk, and the higher the equity's beta, the higher the return on the equity will be. According to the CAPM, therefore, two arbitrary portfolios could generate a different average return simply by having a different beta. During the 1980s, however, differences in returns were discovered that could not be explained by portfolios' beta. For example, it emerged that, on average, a portfolio of small companies generated a higher return than a portfolio of large companies, even when adjusted for a different beta. This is known as the size effect [Banz (1981)]. Similarly, it emerged that, on average, a portfolio of value companies, defined as companies with a high book value relative to their market value (B/M), generated a higher return than a portfolio of companies with a low B/M. This is often referred to as the value effect [Stattman (1980), Basu (1977)].

In a series of studies, Fama and French (1992, 1993, 1996) found that the CAPM is unable to provide a satisfactory description of the relationship between return and risk. These studies argue that this type of analysis should use a multifactor model that captures multiple aspects of risk. Merton (1973) and Ross (1976) laid the theoretical foundations for multifactor models, but none of these models indicate which risk factors should be included. Fama and French show that a three-factor model, which includes factors representing a company's size and value, as well as one representing the market, has significantly more explanatory power for equity returns than the CAPM. The size factor, often referred to as SMB (small minus big), is defined as the return on a portfolio with an overweight of the smallest companies and an underweight of large companies. Similarly, the value factor, often referred to as HML (high minus low), is defined as the return on a portfolio with an overweight of the companies in each size group with the highest B/M and an underweight of the companies in each size group with the lowest B/M.

Fama and French explain the value and size factors as variables which act as a proxy for bankruptcy risk. Fama and French (1995) describe a typical value company as a company that has a low market value because the company is performing poorly and is in a difficult financial position. Such companies can be expected to fare very badly in the event of an economic crisis. Investors do not want a portfolio that loses considerable value at the same time that the rest of the economy is also entering a crisis, and will therefore demand a risk premium for such exposure. The HML factor is intended to represent this risk premium. This argument has also been used to associate the size effect with a risk premium for holding bankruptcy risk [Chan and Chen (1991)]. A number of recent empirical studies suggest, however, that there is little connection between the HML and SMB factors and bankruptcy risk [Dichev (1998),

Vassalou and Xing (2004), Campbell, Hilscher and Szilagyi (2008)]. Fama and French's risk-based interpretation is also based on a tendency for value stocks to perform badly in difficult times. According to the study, investors will demand a risk premium for holding these equities in a situation where investors' marginal utility of wealth is greatest. In contrast, Lakonishok et al. (1994) find no empirical evidence that value stocks fare badly when the market falls sharply or the economy goes into recession. According to Lakonishok et al., there are therefore no grounds for interpreting the value effect as a risk premium. The theoretical basis for Fama and French's model is therefore still unclear. It has nevertheless become established as a standard in empirical studies of asset pricing due to its high empirical explanatory power.

While the efficiency theorists regard the size and value anomalies as compensation for exposure to risk, the behavioural theorists view these anomalies as a result of irrational investor behaviour. Various psychological theories on the formation of expectations show how different mental mechanisms can lead to both underreaction and overreaction [see, for example, Edwards (1968), Tversky and Kahneman (1974)]. DeBondt and Thaler (1985, 1987) show that equities that have lost considerable value over a number of years have had a tendency to outperform the market in the following period. They interpret this reversal as an expression of investors' overreaction. According to DeBondt and Thaler, investors have a tendency to project trends into the future, which may have contributed to these equities having fallen further in value than implied by fundamentals. Typical value stocks will often have the same characteristics as equities whose price has shown a sharp decline. Against this background, the behavioural theorists argue that the value effect can be attributed to investors' overreaction rather than compensation for risk [Lakonishok et al. (1994), LaPorta et al. (1997)]. While the value effect has been addressed by numerous studies, there are relatively few behavioural studies of the size effect. Keim (1983) notes that the size effect occurs mainly in January each year. As there are no grounds for claiming that small companies are riskier in January than at other times, it is difficult to argue that the January effect – and so, to a great extent, the size effect – is compensation for exposure to risk [Shleifer (2000)].

In the wake of DeBondt and Thaler's studies of long-term trends and overreaction, other researchers have found empirical evidence of more short-term trends having a tendency to persist for a period. This is often referred to as the momentum effect. Jegadeesh and Titman (1993) find that equity price movements over the past 6-12 months are often followed by movements in the same direction. A portfolio that is overweight in equities that have outperformed the market portfolio and underweight in equities that have underperformed the market portfolio therefore seems to generate an excess return. This momentum effect is greater than can be explained by the three risk factors in Fama and French's model and so emerges as a robust anomaly [Fama and French (1996), Moskowitz and Grinblatt (1999)]. Some studies indicate that the momentum effect may be related to investors' tax management at the year-end [Grinblatt and Moskowitz (2004)], but the efficiency theorists have not been able to provide a

satisfactory explanation for the momentum effect. In a study of returns on equity mutual funds, Carhart (1997) uses a momentum factor to attribute the return on these funds to various factors that affect equity prices, without this momentum factor having any theoretical basis. A related momentum factor used widely in the academic literature is UMD (up minus down), developed by Kenneth French. This is defined as the return on a portfolio with an overweight of the companies with the highest return in each size group and an underweight of the companies with the lowest return in each size group. Although the theoretical justification for the momentum effect is still unclear, it has become common to include a momentum factor in academic studies of asset pricing.

The size, value and momentum effects were the first anomalies to be identified and are therefore also the most widely cited in the debate on efficient markets. Many other anomalies have since been found that also challenge the efficient market hypothesis. A complete discussion of all documented anomalies in the equity market is, however, beyond the scope of this document.

Differences in returns that are not consistent with simple pricing models have also been identified in the bond market. The best-known theory for the relationship between the returns on bonds of different maturities, often referred to as the term structure of interest rates, is the expectations hypothesis [Lutz (1940), Hicks (1946)]. The expectations hypothesis means that, over a given investment horizon, investments in different maturities will generate the same expected return. This simple version ignores the fact that future interest rates are uncertain, and that investors will demand a premium as compensation for bearing this uncertainty. To take account of this, a variant of the expectations hypothesis is usually used, where the expected interest rate is free to vary with maturity. However, models assume that the interest rate spread between maturities is constant over time. The expectations hypothesis finds little empirical support in academic studies. Several studies show that a strategy where the investor borrows fixed income securities with a short maturity and invests in securities with a long maturity when this interest rate spread is large will generate an excess return over time [see, for example, Fama and Bliss (1987), Campbell and Shiller (1991), Cochrane and Piazzesi (2005)]. The return achieved by an investor using such a strategy can be viewed as reaping a term-structure premium. Whether this opportunity arises because this is a time-varying systematic risk factor or arises as an expression of investor irrationality [Froot (1989)] is still unclear in academic finance [Campbell, Lo and MacKinley (1997)]. In empirical studies of asset pricing, however, the term-structure premium is usually used as a systematic risk factor [Fama and French (1989, 1993)].

The efficient market hypothesis has also been tested in the foreign exchange market. The theory of uncovered interest rate parity states that the difference in interest rates between two countries corresponds to expected changes in the exchange rate between their currencies. The expected return,

translated into a common currency, will therefore be dependent on the currency in which it is invested. Empirical studies, however, find little support for this hypothesis [Fama (1984), Hodrick (1987), Engel (1996)]. Contrary to what the theory of uncovered interest rate parity would indicate, a high-yielding currency has a tendency to strengthen against a low-yielding one. In periods with large interest rate differentials between currencies, there may therefore be opportunities to generate excess return by borrowing in the low-yielding currency and investing in the high-yielding currency. This contradicts the efficient market hypothesis. Researchers have floated various explanations, including time-varying risk premiums on foreign exchange [see Engel (1996) for an overview], irrational bubbles [Cavaglia et al. (1994)] and objections to the statistical methods used in this type of study [Baillie and Bollerslev (2000)]. Recent studies argue that the excess return produced by this type of strategy is compensation for exposure to extreme events in the foreign exchange market [Brunnermeier, Nagel and Pedersen (2009), Farhi and Gabaix (2008)].

The yield spread between non-government and government bonds is known as the credit premium and is normally positive. It is often viewed as compensation for expected losses due to defaults on non-government bonds. In academic research, however, it has been shown that the credit premium is much larger than can be explained by expected losses alone [Elton et al. (2001)]. This may seem to contradict the efficient market hypothesis. Recent research has identified several other factors that are significant for the credit premium. There is much to suggest that liquidity risk is an important systematic risk factor which explains parts of the credit spread between non-government and government bonds [Driessen (2005), DeJong and Driessen (2006)]. The bankruptcy risk in a portfolio of non-government bonds means that there is a small but significant probability of heavy losses, while the probability of making corresponding gains is non-existent. Even in a large portfolio of non-government bonds, it will not be possible in practice to diversify away this risk, as events of this type will normally coincide. This therefore constitutes a systematic risk factor in the return on non-government bonds [Hull et al. (2005), Amato and Remolona (2004)].

Volatility, or the risk of fluctuations in securities prices, has become established as a separate asset class in recent years. This has been driven mainly by investors' desire for diversification. At the same time, new financial instruments have made it straightforward to obtain direct exposure to volatility. The returns of assets tied to levels of volatility are negatively correlated with the equity market, and this relationship is particularly strong when the equity market falls sharply. Exposure to volatility therefore provides insurance against heavy losses on an equity portfolio when the market takes a tumble. Empirical studies, however, show that this downside insurance is expensive, in that the price of the insurance exceeds expected losses over time [Carr and Wu (2007), Bakshi and Kapadia (2003), Bondarenko (2004)]. The volatility premium, defined as the difference between expected (implicit) and realised volatility, has a tendency to be positive. This means that, over time, it has been possible to

generate excess return by selling volatility. The excess return produced by this type of strategy can be interpreted as compensation for giving other market participants insurance against sharp falls in the markets. The volatility premium is often explained by the asymmetry between facing a potentially unlimited loss in cases where the investor sells volatility, and facing a loss limited to the premium paid in cases where the investor buys volatility. Sellers of expected volatility will demand compensation for this asymmetry in the form of a risk premium. Other explanations refer to the fact that the majority of participants in the market for volatility are buyers of volatility, whereas very few have the financial strength to offer volatility. There is much to suggest that part of the volatility premium also reflects this structural imbalance in the market for volatility [Bollen and Whaley (2004)].

1.1.3 Summary – efficient markets

- There is no contradiction between the modern efficient market hypothesis and active management. In contrast, it is essential for a well functioning market that there are investors who take investment decisions based on perceptions of the fundamental value of securities. Over time, informed investors can expect to be compensated by uninformed investors for identifying inefficiencies and trading accordingly.
- Efficient markets presuppose that informed investors will take positions so that market mispricings are traded away. In practice, this arbitrage will be both risky and capital-intensive. Modern financial theory shows that risk and capital may place constraints on the extent of arbitrage and may lead to the persistence of inefficiencies in financial markets over time. For an active manager, it will be important to be able to vary risk exposure in order to exploit periods when the degree of market inefficiency is particularly high.
- For an investor, an arbitrage position will be more expensive to hold if the mispricing can persist for a long period, and cheaper where the pricing of assets quickly returns to its fundamental value. In an equilibrium model, therefore, the expected return from exploiting long-term mispricings must be higher than for short-term mispricings. Few investors will be able to exploit these long-term opportunities. An active manager with the capacity to hold positions for a relatively long investment horizon may therefore have an advantage.
- Investors can have a tendency to categorise securities in various ways, for example by geography or index. Many investors also concentrate on a smaller selection of securities than are investable globally, due partly to transaction costs, trading restrictions, regulations, or limited information. This may result in the segmentation of investors into groups which focus on different parts of the financial market. For a global investor investing in different asset

classes, it will be appropriate to attach importance to the level of efficiency in each individual market and the opportunities to exploit mispricings between market segments.

- Over the past 20 years, a rising number of new factors have been documented as being associated with higher returns over time than can be explained by the capital asset pricing model (CAPM); these are known as anomalies. There is not agreement as to whether these reflect an inefficient market or systematic risk which is not captured by pricing models. Developments in academic finance show that our understanding of financial markets is evolving rapidly. New factors will, in all probability, be identified and incorporated before declining in importance. In this light, it is crucial for a long-term investor to have sufficient flexibility to adapt quickly to new insights.

1.2 The empirical basis for active management

Extensive research exists on the profitability of active management. Most of this research is based on US mutual funds where the data are of high quality and are readily available. However, some studies have also been conducted on mutual funds outside the US, institutional managers, endowment funds, and hedge funds and these may in several respects provide a more useful basis for comparison for the Government Pension Fund Global.

There are various methods for evaluating the performance of fund management. For an investor, the relevant measure of whether or not fund management has been successful will be return in excess of the benchmark index less costs. However, excess return can be calculated in a variety of ways. In the academic literature it is customary to decompose excess return into various factors that have a systematic impact on the price of securities. The term beta is often used to refer to the part of excess return that can be attributed to systematic factors, whereas alpha is the excess return over this. If it is assumed that these factors are risk factors, beta can be interpreted as the part of excess return that is attributable to compensation for exposure to the various risk factors. Alpha will then be interpreted as that part of excess return that cannot be attributed to passive exposure to systematic risk. In academic studies, alpha is used as a measure of whether or not management has been successful.

Against this background, various definitions of alpha are used. If the market alone is applied as a risk factor, the resulting alpha estimate is referred to as Jensen's alpha or the CAPM alpha. In the case of equity portfolios, the most commonly used models are the Fama-French three-factor model, or a variant

thereof, augmented by a momentum factor. These models are often referred to as Fama-French three-factor-alpha model or Carhart four factor-alpha model.

1.2.1 Equity funds

The profitability of active management has been the subject of academic focus since the first study of equity funds in Jensen (1968).

Two overall conclusions can be drawn on the basis of the research conducted since Jensen. First, as a group, US equity funds have not succeeded in generating excess return for their investors over their individual benchmark indices after management costs. These studies are based on the figures recorded for the returns of these funds, i.e. return on stocks, cash, and other securities held by the fund less both transaction costs and management fees [see for example Gruber (1996), Carhart (1997)]. Second, those studies that consider the stock-picking talent of managers viewed in isolation reveal that the managers, on average, have succeeded in identifying securities that outperform the rest of the market. Generally, these studies look at the actual portfolio of stocks held by the individual fund and then consider whether this portfolio of stocks has out- or underperformed the benchmark index of the fund. This approach allows cash and other securities to be excluded from the analysis. This provides a more precise picture of whether the active stock-picking has contributed to out- or underperformance [see for example Grinblatt and Titman (1989, 1993), Grinblatt, Titman and Wermers (1995), Daniel et al. (1997) and Wermers (1997)].

In one study, Wermers (2000) compares the two alternative approaches by decomposing excess return into three parts: one showing the stock-picking talent of the manager; one showing costs and one showing the return on the non-stock holdings of the fund. The study reveals that during the period 1974 to 1994, the portfolio of equities held by the funds outperformed the market by an average of 1.3 per cent per annum. In other words, the stock-picking generated excess return. However, during the same period the net returns of the funds after costs underperformed the market by one per cent. Of this difference of 2.3 per cent, 1.6 per cent can be attributed to transaction costs and management fees, while 0.7 percentage point is attributable to the fact that the bonds and cash held by the funds produced lower returns than the equities market in the period 1974 to 1994.

Part of the excess return generated by the manager can be attributed to exposure to various systematic risk factors. Wermers shows that of the total excess return of 1.3 per cent attributable to the equity choices of the manager, only 0.6 per cent can be ascribed to exposure to the traditional risk factors. The

remaining 0.7 per cent can be attributed to the stock-picking talent of the manager. These too are positive, statistically significant results. However, risk adjusted excess return after all costs is negative and statistically significant using a 4-factor Carhart model. These results are confirmed by Fama and French (2009), who also find that mutual funds in the United States have succeeded in achieving risk-adjusted excess return before costs using a 4-factor Carhart model. However, after costs are deducted, the risk-adjusted excess return is negative.

There have been few studies of equity funds outside the US. Otten and Bams (2002) analysed the performance of mutual funds in the major European countries in the period 1992 to 1998. The results suggest that European managers on average generated risk-adjusted returns after costs using a 4-factor Carhart model. Excess return was particularly high for funds investing in small companies. Ferreira et al. (2009) study mutual funds on a global basis over the period 1997 to 2007. The various funds are classified as either domestic or international. Domestic mutual funds have a positive CAPM alpha after costs. However, with a 4-factor Carhart model, alpha is negative, but not statistically significant. There are, however, major differences between the countries. Whereas the estimated Carhart alpha for the United States is below the global average, the alpha for countries such as India, Indonesia, Malaysia, Poland, South Korea and Thailand are markedly higher. The estimated alpha for international equity funds is consistently lower than for domestic funds.

Persistence is normally understood as the extent to which a fund that has performed well during one period will also have a tendency to perform well in the following period. If we assume that excess return can be attributed to the skill of the manager, we would expect to find persistence in the returns on the funds that perform well, assuming that the managers remain the same. The degree of persistence has been a subject of discussion since the first study of mutual funds in Jensen (1968). Since then, a number of studies have found signs of persistence [see for example Brown and Goetzmann (1995)] whereas Carhart (1997) demonstrated that all persistence disappears if account is taken of the momentum effect. This has long been the dominant view, see the discussion in Cochrane (2000). A number of more recent studies, however, [for example Bollen and Busse (2005), Cohen, Coval, Pastor (2005) and Avramov and Wermers (2006)] show that predictability is found in the returns of mutual funds even after adjustment has been made for momentum effects, while Fama and French (2009) find no support for persistence. Bessler et al. (2008) note that every year a high proportion of managers of mutual funds are replaced, and that funds that have generated excess return have a tendency to underperform if a new manager is appointed. By the same token, funds that have performed poorly during a period and thereafter change manager have a tendency to improve their performance. Evidence would thus suggest that mutual fund management skills are dependent on the individual manager and that the replacement of managers makes it difficult to identify persistence in excess return at the fund level. Adjusted for the effect of changes of fund manager, the degree of persistence is amplified considerably

according to Bessler et al. (2008). The extent of persistence or predictability in mutual funds remains an open question.

Whereas persistence measures the extent to which last year's excess return can be applied for the purpose of estimating next year's excess return, more recent studies have focused on whether managers who deliver good results over time have common characteristics. These studies identify a number of characteristics that are typical of good managers. The degree of persistence will also be greater if the analysis is confined to fund managers with these characteristics.

1.2.2 Bond funds

There have been relatively few empirical studies of actively managed mutual bond funds. Blake, Elton and Gruber (1993) study returns on US bond funds during the period 1979-1998. In their analysis they use multifactor models incorporating various systematic risk factors for the bond market, such as return on the bond market as a whole, return on corporate bonds and return on mortgage-backed bonds. The results indicate that on average the bond funds were unable to deliver excess return relative to the relevant benchmark indices. Nor were there signs of persistence in the returns on these funds. Huij and Derwall (2007) adopt the same approach as Blake et al., but based on a broader data set comprising 3500 mutual bond funds during the period 1990 until 2003. The results indicate that on average the risk-adjusted excess return was negative for the bond funds in the study. On the other hand, the findings of this study indicate a high degree of performance persistence in the excess return. This suggests that there is a clear tendency for bond funds that perform well in one year to also perform well in the following year, which may be related to the fact that some managers are more skilful than others. In a more recent study Chen, Ferson and Peters (2009) study US bond funds during the period 1962 until 2007. Their results show that bond funds as a group significantly outperform benchmarks before costs, but significantly underperform benchmarks after costs. Accordingly, the studies that we have reviewed present a mixed picture of whether it is possible to generate excess return through active bond management. Nevertheless, all the studies show that bond funds are unable to deliver excess return for the clients of these funds after costs have been deducted.

1.2.3 Hedge funds

The amount of capital under management by hedge funds has increased significantly over the past 15 years, particularly as a result of capital inflows from institutional investors. There is no clear and unambiguous definition of a hedge fund. The term is normally used as a catch-all designation for

professional fund managers who have a relatively free hand as regards their investments. Hedge funds often apply specialised investment strategies that demand specialist expertise and infrastructure. Many hedge fund strategies are presented as strategies tailored to deliver a high return without exposure to traditional systematic risk factors. As a result, the hedge fund industry has also been the subject of academic research. Taken as a whole, the research findings indicate that hedge funds generate excess return adjusted for traditional risk factors. However, the risk-adjusted excess return largely disappears if the results are adjusted for factors that represent other risk premiums that hedge funds traditionally attempt to harvest, such as volatility and trends [Fung and Hsieh (1997), Agarwal and Naik (2005), Fung et al. (2008), Ang et al (2008), Brooks, Clare and Motson (2007)].

The data on the returns recorded by hedge funds suffer from a number of weaknesses. One of these is that the data do not include the results from a number of funds that have been shut down as a result of poor results (survivorship bias). Fung et al. (2008) study the performance of hedge funds during the period 1995-2005 using a database where attempts have been made to adjust for this. The study shows that the hedge funds are capable of generating risk-adjusted excess return, but only in one of the sub-periods covered by the study is the excess return positive and statistically significant. However, there are major variations between the hedge funds. The degree of persistence proves to be markedly higher for the group with high excess return than for the group with low excess return. Jagannathan, Malakhov and Novikov (2009) have also analysed the degree of persistence among hedge funds and have reached the same conclusion. This might suggest that the best hedge funds have managers who are capable of outperforming the market over time. The study conducted by Brooks et al. concludes that hedge funds as a group have generated 13.2 per cent excess return on average per annum after costs and management fees. The risk-adjusted excess return is estimated to be 5.7 percentage points per annum.

1.2.4 Institutional funds and endowments

Relatively few studies have looked at the management of endowments or funds directed at institutional investors. Nevertheless, those studies that have been conducted indicate that institutional management of US products has generated excess returns [Ferson and Khang (2002), Busse, Goyal and Wahal (2008)].

Busse, Goyal and Wahal (2008) use data on institutional mutual funds on the US stock market. The study shows that between 1991 and 2007 institutional fund managers as a group, on average, generated 0.5 per cent in excess return per quarter after transaction costs (but not management fees). This is statistically significant. 0.1 percentage points of this can be ascribed to the three Fama-French factors. If an additional allowance is made for the momentum effect, the study shows the risk-adjusted excess

return of approximately 0.3 percentage point per quarter. Small niche products post better returns than large products. Busse, Goyal and Wahal find that the dispersion in return over the various products is considerable and attempt to identify characteristics that can be applied in distinguishing the well-performing funds from the poorly performing funds. The results indicate that the risk-adjusted excess return is significantly higher for funds that are restrictive in their use of advice and analyses provided by the analysts of investment banks and broking houses. Similarly, they find a statistically significant relationship between the risk-adjusted excess return recorded by the funds and a variable representing the quality of the fund's employees.

Brown, Garlappi and Tiu (2009) analyse the return recorded by university endowments over the period between 1990 and 2005. These endowments typically have broad investment mandates and, as well as stocks and bonds, also have exposure to alternative asset classes such as hedge funds, unlisted markets, and commodities. Although the endowments enjoy a broad degree of discretion in determining their exposure to the various asset classes, it seems that they exploit this opportunity only to a limited degree. The part of the return enjoyed by the endowments that derives from allocation between the various asset classes is accordingly fairly similar across the range of endowments, whereas generally the active choices of securities within the individual asset classes distinguish the high performing endowments from lower performing ones. Brown, Garlappi and Tiu demonstrate that, as a group, the endowments have delivered excess return in the period 1990-2005, which reflects the findings of Lerner Schoar and Wang (2008). The risk-adjusted excess return is also significantly positive if a 3-factor Fama-French model is applied. If a momentum factor is included, the risk-adjusted excess return remains positive but not statistically significant.

1.2.5 Private investors

Empirical studies of private investors consistently indicate that on average this group achieves a markedly lower return than the market [Barber and Odean (2000), Frazzini and Lamont (2008)]. Moreover, there are many indications that this group of investors is particularly susceptible to the influence of the prevailing mood of the market. A limited ability and capacity to make informed investment decisions may lead investors of this type to buy and sell shares that are visible in the normal news media [(Barber and Odean (2006))].

Cohen, Gompers and Voulteenahe (2002) look at the interplay between institutional managers and private investors. The study finds support for the view that institutional managers purchase shares from private investors in response to positive news. At the same time the authors show that institutional

managers sell shares to private investors when the price has increased and without there having been positive news about fundamental conditions. This is one reason that institutional managers on average achieve a higher return than private investors.

1.2.6 Summary of the empirical basis for active management

- Our review of empirical studies into the profitability of active management within various asset classes suggests that under certain conditions it is possible for investors to build up an informational advantage that can be applied in generating excess return. However, the level of transaction costs and management fees will be critical as regards the proportion of the excess return that accrues to the client.

1.3 The theoretical basis for the management of systematic risk

1.3.1 The benchmark portfolio and systematic risk

An investment strategy is generally expressed by means of a benchmark portfolio which reflects the owner's desired exposure to various asset classes. The allocation indicated by the benchmark portfolio will often be based on assumptions about expected return and risk, the covariance between the asset classes and an understanding of the owner's risk-bearing capacity and horizon. An alternative to viewing the investment strategy as an allocation to various asset classes is to see it as an expression of an allocation to various risk premiums in the financial market [Cochrane (1999)]. In efficient markets it will be possible to achieve a higher return than the risk-free rate only by accepting a certain systematic risk, which we call a risk premium. For example, the allocation to equities will earn the risk premium of the stock market, or the expected return on the stock market over and above the risk-free rate, while the composition of the fixed income benchmark should earn a term-structure premium and a credit premium on the fixed income market.

Discussions about the quality of active management are often based on the assumption that the benchmark portfolio provides a perfect expression of the required exposure of the owner to all systematic risk. If this is the case, active management should be directed towards achieving alpha, or excess return that is independent of systematic risk. However, a number of factors indicate that an investor should also adopt an active approach to the management of systematic risk.

A widespread approach among institutional investors is to apply fixed weights to various asset classes. If the markets are efficient, market capitalization will at any given time reflect the available investment opportunities. An investor adopting this approach should rebalance to a lower proportion of equities than the original point of departure if a major rise in share prices occurs. If the investment opportunities vary over time and a downturn in the stock market results in expectations of a higher risk premium on equities, the optimal approach will be to rebalance to a higher proportion of equities than the original level. The use of fixed weights and a rebalancing regime means that the investor's fund management will be based on time-varying risk premiums and that a certain degree of active management of systematic risk is institutionalised. A rebalancing regime of this nature will ensure that an investor has a rule in place that will increase exposure to an attractively priced risk premium in situations characterised by unrest and decision-making difficulty.

Within an asset class, a market capitalisation-weighted benchmark portfolio will be appropriate only for investors with average risk aversion. An investor with a lower-than-average risk aversion and a long-term investment horizon should have greater exposure to different risk premiums than indicated by the market portfolio [Cochrane (1999), Campbell and Voulteenaho (2004)]. Within individual asset classes the investment opportunities will also vary over time and optimal allocation with respect to systematic risk factors will also vary. In addition, new sources of systematic risk are constantly being identified, and systematic risk factors exist that cannot readily be represented by simple indexes. The management of systematic risk should form an integral part of the overall operational management. This will ensure that there is sufficient flexibility in relation to new opportunities and may play a part in improving the trade-off between expected return and risk.

1.3.2 Time-varying risk premiums

For the purpose of allocation decisions, the risk premium in the stock market is the main consideration. The expectation that over time equities will afford a higher return than investments in fixed income instruments provides the justification for a high allocation to equities. If investment opportunities change over time and there is confidence in the quality of the predictions of the returns on the equities market, it could be argued that the actual allocation of assets should be dynamic. Since the 1990s, the view that the stock market is predictable has gained increasing support in academic circles. However, this proposition was recently questioned by Goyal and Welch (2008) who reviewed various predictive regressions proposed in the academic literature. They conclude that "...the profession has yet to find some variable that has meaningful and robust empirical equity risk premium forecasting power." Campbell and Thomson (2008), however, show that imposing simple restrictions deriving from investment theory on the predictive regressions would allow investors to create value by exploiting

strategies whereby exposure to the stock market is varied over time. Cochrane (2008) and Ang and Bekaert (2007) also argue in favour of the predictability of stock market returns. These studies could indicate that a fund with a sufficiently long investment horizon could exploit changes in the risk premium even when this positioning will generate a return only in the longer term.

Assuming that we accept the argument that a risk premium exists for the size and value factors described earlier, it will not necessarily be the case that the actual exposure of the portfolio to these factors should remain fixed over time. Cochrane (2000) points out that the risk premium for the size factor has declined on the US market over time since it was described in the academic literature and that this may be an outcome of the exploitation of the risk premium by investors. There may be grounds for arguing that the risk premium associated with investing in small cap companies can now best be earned in less developed markets. Here again, active management is best suited to performing a review of the opportunities for improving returns by means of an allocation to smaller equities.

Cohen, Polk and Voulteenahe (2003) show examples of the predictability of the value premium, based inter alia on the differences between the valuations of value and growth stocks. One of their main conclusions is that the value premium is especially high when this difference is high and market prices are low. Kong et al (2009) point out that most of the academic literature on the equity premium focuses on aggregate values. The authors find predictability for a number of components of the market portfolio such as low market capitalisation and value stocks. The authors show that this predictability can improve the return on the portfolio through adjustment of exposures over time.

The momentum effect changes continuously. The satisfactory representation of the factor in a traditional benchmark portfolio will therefore not be possible. A strategy directed at exploiting the risk premium which follows from the momentum effect must be implemented as part of the operational management.

As is the case for the other risk premiums, the size of the credit, forward, and foreign exchange premiums will vary over time. The ways in which these anomalies can best be exploited will also change over time. The return on a strategy that seeks to earn a credit premium will for example depend on the segment of the bond market within which the investor operates. The flexibility to continuously assess how and where in the fixed income market the best return can be secured for taking this type of systematic risk will therefore be a prerequisite for exploiting these risk premiums efficiently. The credit, forward, and foreign exchange premiums are anomalies that in various ways are associated with both liquidity risk and the risk of extreme events. A large, long-term investor will enjoy an advantage in being

able to bear this type of risk and will thereby also earn the risk premiums associated with these anomalies.

The volatility premium is also time-varying and how and where an investor will secure the best return for taking this type of risk will also vary over time. Exposure to this risk premium can therefore best be safeguarded within an active mandate for managing systematic volatility risk across all asset classes. The volatility premium is in part a result of a structural imbalance in the financial market where multiple investors and investment banks seek to hedge against risk, but where there are insufficient counterparties capable of bearing this risk. A large, long-term fund with a high risk-bearing capacity will have an advantage in that it will be capable of undertaking this type of risk and generating excess return by earning risk premiums on these markets.

1.3.3 *The liquidity premium*

At some point or another all investors will have a basic need for liquidity. The need for liquidity derives from the need to immediately perform a transaction, for example to meet a payment commitment. However, not all investors need liquidity at the same time. This means that investors who do not require liquidity will, at a given point, be in a position to benefit by offering liquidity to investors who do need it. This profit can be termed a liquidity premium. Liquidity has many dimensions and manifests itself in different ways for different classes of assets [see Amihud, Mendelson and Pedersen (2005) for an overview]. Accordingly, there is no unambiguous and generally accepted way of identifying and isolating systematic liquidity risk. For this reason, liquidity exposure cannot be attained simply and cheaply through ordinary indices. Against this backdrop, it will be very difficult to reflect the required exposure to systematic liquidity risk with the aid of a benchmark portfolio. Exposure to different forms of systematic liquidity risk can best be attained through active management of various investment strategies which directly and indirectly exploit this risk premium.

Investors with a long investment horizon, and little need for liquidity of their own, will be well positioned to benefit as providers of liquidity. A long investment horizon generally ensures that the liquidity risk, or the risk that a short-term need for liquidity will arise, will be low. Accordingly, investors of this type will be in a position to earn a premium by offering liquidity and thus bearing the liquidity risk. Because of their long horizon, the liquidity risk will be minimal for these investors and the liquidity premium can accordingly be viewed as compensation for bearing a risk that for them is relatively low.

Liquidity risk plays a central role in a number of the anomalies identified in the financial markets. Evidence suggests that the return on strategies that exploit the size and value effect in the stock market and the credit and term structure premium in the bond market can in part be attributed to exposure to liquidity risk. In addition to these familiar anomalies, there are many other dynamic trading strategies that also entail indirect exposure to liquidity risk. Khandani and Lo (2007) argue that the return on an investment strategy which exploits reversal effects where an investor underweights stocks that have increased greatly in value during the course of the last week and overweights stocks that have decreased greatly in value can to a large extent be interpreted as compensation for taking liquidity risk. A number of other investment strategies widely used within the hedge fund industry can be understood in the same way [Gibson and Wang (2008)].

The significance of liquidity in the pricing of financial assets is a large and active area of research within the field of academic finance. Our understanding of this risk factor and the development of new methods and instruments for use in gaining exposure to liquidity risk will change over the coming years. Active management of this risk factor will ensure that the management strategy can rapidly be changed in the light of new knowledge.

The traditional value and momentum effects were originally identified in the US stock market. Since then, researchers have found equivalent effects in other countries and in other classes of assets. Thus, this research suggests that these effects are universal in that they apply globally, at several levels of aggregation and to multiple classes of assets. Confirming this, Asness, Moskowitz and Pedersen (2009) document value and momentum effects within several countries, across country equity indices and in the markets for government bonds, currencies and commodities. The study also reveals that the value effects (momentum effects) are correlated positively across asset classes and that the value and momentum effects correlate negatively both within and across different asset classes. The consistent patterns of correlation are an indication that the value and momentum effects can be related to one or more common global factors. Asness et al. argue that liquidity risk is a key common driver. Whereas the value effect is positively related to liquidity risk, the momentum effect appears to be negatively related to liquidity risk. Changes in liquidity risk might therefore help to explain why each of these effects is positively correlated across asset classes, and also why value and momentum are negatively correlated both within and across asset classes. Against the backdrop of these relationships, Asness et al argue that studying value and momentum effects simultaneously and across all asset classes can offer major advantages over studying the individual anomaly within each asset class in isolation. This broader approach to these effects could make it simpler both to identify and to exploit these risk premiums. Against this background, a large, global manager represented in multiple asset classes may be in a better position than other managers to succeed in actively managing this type of systematic risk.

1.3.4 Summary of management of systematic risk

- A long-term investor with a high risk-bearing capacity should seek to exploit systematic risk factors. Risk premiums can play out over extended periods of time and some can be viewed as compensation for bearing liquidity risk or the risk of extreme events.
- A traditional benchmark portfolio based on asset classes and regional allocation cannot provide an optimal expression of all the known risk premiums to which an investor should be exposed. Moreover, the areas in which an investor receives the best payment for exposure to a given risk factor will also change.
- Certain systematic risk factors have an asymmetric return distribution. This requires that an expected positive long-term return must be balanced against the likelihood of major short-term losses. An investment strategy aimed at exploiting this type of risk premium must accordingly be well communicated, understood and anchored in the control structure.
- Since investment opportunities change over time, a long-term investor should have sufficient flexibility to make the required adjustments. Actively managing systematic risk may improve the trade-off between risk and return and may, in certain situations, play a part in reducing overall risk.

1.4 Features of successful active management

Sharpe (1991) points out that the return for all investors in the market must be equal to the return for the market (before costs) since all shares in issue are owned by investors and the market return is simply the return on all these shares. Every investor who does not own the entire market portfolio is, for these purposes, defined as an active investor. Modern efficient market theory accordingly holds that values in the market will be transferred from investors with little information and high costs to investors with good information and low costs. The literature documents certain properties and characteristics that can help to explain and predict who these managers will be. The findings of this research are the

subject of this section. We have opted to distinguish between features of governance structure, the organisation, the structure of management and the incentive structure.

1.4.1 Governance structure

1.4.1.1 Aligned interests

The goal of commercial enterprises is to earn profits for their owners. The same applies to fund management companies. As a consequence, conflicts of interest may arise between the clients, who seek to earn money on their investments, and the fund management company, which seeks to earn money on the clients. Bogle (2008) points out that the optimal structure for avoiding this type of conflict of interest will be one in which the client owns the fund management company. In the same study, Bogle finds that of the 50 largest fund managers in the US, four of the best managers in terms of returns are neither publicly owned nor part of a major financial conglomerate. Investment management firms within major financial conglomerates occupy the 17 lowest-ranking places on the list. In another study, Ferris and Yan (2007) show that publicly-owned investment management firms in the US consistently deliver poorer returns than unlisted independent investment management firms.

1.4.2 Organisation

1.4.2.1 Size

Investment management offers economies of scale. In addition to the cost-related advantages afforded by a larger base across which to distribute fixed costs, size can offer better access to information as well as to investment opportunities. However, size also poses a number of challenges. These relate primarily to transaction costs following from higher trading volumes as well as potential bureaucracy and hierarchy-related costs. In the US, Chen, Hong, Hunang and Kubik (2004) find that large management organisations outperform smaller organisations but at the same time that large individual funds (equities) underperform smaller funds. According to this study, the latter circumstance is primarily a problem for large funds investing in small companies where frequent trades in less liquid shares result in higher transaction costs. The best solution according to Chen et al. (2004) is to opt for smaller funds within a large organisation. In a study of mutual funds in 27 countries, Ferreira, Miguel and Ramos (2006) find that outside the US and within global funds, larger funds outperform smaller funds. Nevertheless, they point out that funds in the US are consistently much bigger than funds in other markets. Their findings are accordingly not considered to conflict with the findings of Chen et al. (2004).

In the case of hedge funds, Ammann and Moerth (2005) find that medium-sized funds outperform large and small funds alike. Busse, Goyal and Wahal (2006) find no connection between returns and size in the case of bond funds.

1.4.2.2 *Delegated decision-making authority*

A committee can derive benefit from several heads thinking at the same time, the members can correct each other's mistakes and complement each other. However, a number of studies have suggested that a committee structure can create the illusion that all possible events are under control (Kogan and Wallach (1965), Kahneman and Tversky (1979), Pelled, Elisenhardt and Xin (1999)). Within a structure of this nature, there is a considerable risk of group thinking where the committee strives to achieve unanimity at the expense of the quality of the decision (Janis 1982). There are also indications that group members are less motivated in situations in which they are working in a committee than when they are working individually (Williams, Nida, Baca and Latané (1987), Weldon and Gargano (1988)). In the field of investment management, Chen et al. (2004) find that US mutual funds managed by decision-makers with delegated authority outperform funds managed by committees. This underperformance is attributed to a hierarchy cost where a relatively high proportion of resources is expended on persuading other group members rather than on seeking new investment ideas. Ferreira et al. (2006) found corresponding results in their global study. Han, Noe and Robello (2008) suggest that the higher returns observed in funds managed by decision-makers with delegated authority can be attributed to the attractiveness of the structure to skilled managers rather than to the organisational form as such.

1.4.2.3 *Human capital*

Several studies document a significant positive relationship between the abilities of managers to achieve excess return and various measures of the formal qualification and abilities of the managers, such as level of education (Chevalier and Ellison (1999), Gottesman and Morey (2006), Busse, Boyal and Wahal (2008), Grinblatt, Keloharju and Linnainmaa (2009)).

1.4.3 *The structure of management*

1.4.3.1 High degree of specialisation

Grossman and Stiglitz (1980) demonstrate that managers with information gathering costs that are lower than the marginal cost of the market should, in theory, be rewarded with positive excess return. Specialisation facilitates greater access to detailed information, while at the same time reducing the costs associated with information gathering. Specialisation here involves concentrating on a limited part of the global market, such as a particular geographical area, industry or type of instrument on the fixed income market.

Geographical specialisation

Hau (2001) finds that German traders outperform traders trading in German equities from outside the country and that among foreign traders, those who speak German outperform the others. Choe, Kho and Stulz (2005) and Dvorak (2005) show that foreign investors in Korea and Indonesia underperform local investors. Ferreira et al. (2006) find that the estimated excess return of global mutual funds is consistently lower than that of the domestic funds. Foreign investors perform better if they speak the dominant language of the market in which they are investing. In their study of 32 countries, Bae, Stulz and Tan (2006) show that local analysts are more accurate in their estimates than those working from a base outside the country. This is particularly true in the case of emerging markets and companies whose primary targets are local customers and consumers. Even within an individual country, it has been shown that managers perform better where they invest in companies headquartered close to where they themselves are located (Coval and Moskowitz (1999, 2001), Chen et al. (2004), Malloy (2005)).

Sector specialisation

Specialists in particular industry sectors have in-depth knowledge of the industry chain and competition within a small portion of the global market. Van Nieuwerburgh and Veldkamp (2008) show that specialisation is important in order to achieve the efficient compilation of information. Kacperzyk, Sialm and Zheng (2005) show that managers who concentrate on a limited number of sectors consistently achieve better results than managers who spread themselves thinly over large portions of the market. Khorana and Nelling (1997) find that sector funds perform better than sector indices, and Bushee and Goodman (2005) find evidence of a link between sector expertise and informed trading. Cohen and Frazzini (2008) show that market pricing does not fully incorporate news about related equities (clients in this specific study). Huberman and Regev (2001) show how information published in a trade magazine

impacts fully on stock prices only when the same news is published in the New York Times. Thus specialist managers who monitor news in a specific industry can accumulate an advantage over managers who base their investments on information in the mainstream media. Cohen et al. (2008) emphasise the importance of a network of contacts for sourcing information. This type of network is easy to establish for managers who have repeated meetings and long-term associations with industry representatives.

1.4.3.2 Internal analysis capacity

The modern efficiency hypothesis suggests that share prices reflect general information available in the public domain, but that managers can achieve excess returns by obtaining information that is not yet widely available. Cheng, Liu and Qian (2006) find that fund managers who utilise independent internal analysis outperform those who base their decisions on brokers' analyses. Kacperczyk and Seru (2005) find that managers who base their decisions on information they have compiled themselves outperform managers who invest both in accordance with and against the advice of the broker department. Both studies find that small fund management firms base their decisions on brokers to a greater extent than is the case for larger management firms and that those who utilise broker information have a higher transaction volume and are more short-term. There are also indications that managers with access to internal analysis exploit long-term mispricings and non-event specific information (Kacperczyk and Seru (2007)).

1.4.3.3 The ability to think differently from other market participants

Findings by Wermers (1999) and Sias (2004) indicate that the price of shares purchased by a large number of investors (the herd instinct) will often rise during the course of the purchasing period and the subsequent months. This effect is greatest in the case of smaller companies. Gutierrez and Kelley (2009), however, find that three quarters later the same shares start to underperform the market. This suggests that the market participants are not simply pressing share prices upwards towards the underlying value of the shares, but through this level. Cohen, Gompers and Voulteenaho (2002) show that institutional investors often purchase shares from individuals in connection with favourable cash flow news. They thereby exploit the tendency of the market to underreact to positive news, as noted in the literature. When the price subsequently rises without new information having become available, the same institutions sell the shares back to individuals and the share prices drop. The results emphasise the importance of exercising caution before investing in securities that are already largely owned by multiple institutional investors. Cohen, Coval and Pastor (2005) present data demonstrating the

importance of knowing the identity of your co-owners. Cohen, Polk and Silli (2008) show that managers achieve the highest returns on large investments in companies that few other professional managers have as their largest investment. This suggests that the best place for managers to seek to achieve excess return is through investment ideas that other managers have not yet found.

1.4.3.4 Concentrated portfolio

Baks, Busse and Green (2006) find that portfolio managers with portfolios which in relative terms are concentrated outperform managers with broadly diversified portfolios in the US. Brands, Brown and Gallagher (2006) find the same results for Australia. Cremers and Petajisto (2007) introduce a concept called *active share* which measures the active difference between the portfolio holdings and the benchmark index. The authors show that managers with a high active share are able to create excess return relative to the benchmark portfolio (both before and after management fees) and that the return they achieve is significantly higher than funds that are closer to the index portfolio (even after adjustment for systematic risk factors such as momentum). Furthermore, the authors find that in funds with a high active share the link between historical and future returns (persistence) is strong.

Cohen, Polk and Silli (2008) show that the biggest positions held by managers generate higher risk adjusted returns than not only the market but also other positions held by the same managers. Moreover, the study shows that the average manager achieves positive returns on the biggest relative positions even if the manager's overall portfolio does not outperform the market. The results indicate that the typical professional manager is in fact able to pick stocks. A preference to bring new assets under management and thereby maximise the fee, might for example lead managers to include shares in the portfolio on which they have no views. Moreover, the need for day-to-day liquidity may force managers to hold many liquid shares in their portfolio. Thus the result of conflicts of interest and suboptimisation is that the portfolio that the manager ends up with does not generate excess return after fees.

1.4.4 Incentive structure

The principal-agent theory considers how best to proceed in handling the inherent conflict of interest in a relationship in which one party, the agent, is retained by a second party, the principal, to perform a specific task. In such situations the principal delegates decision-making authority to the agent. At the same time, the principal is aware that the agent's preferences and access to information may diverge from those of the principal. Jensen and Meckling (1969) and Ross (1973) conducted the basic work on

how a principal should design a reward structure in order to give the agent incentives to make the optimal efforts and adopt the optimal decisions. The agent should receive a share of the returns on the activity, the performance-based share of the reward should not be influenced by factors over which the agent has no control and the relationship between potential gains and potential losses should be symmetrical. The first two points reflect prevailing practice for the majority of portfolio managers, whereas the third appears only to be reflected to a limited degree in performance-based reward systems. However, reward systems where the annual disbursement is dependent upon results achieved over multiple years afford a certain degree of symmetry in the handling of annual gains and losses.

The general theory on performance-based rewards is not directly applicable in a situation involving delegated portfolio management. This is primarily because of the need to maintain a structure that contributes to optimal risk-taking on the part of the manager/agent. It will be difficult for the principal to identify the managers' ability to generate excess returns and the efforts the manager will make in utilising his/her skills.

The literature on delegated portfolio management highlights further challenges associated with the general prevalence of performance-based reward systems. First, an asymmetrical disbursement profile in the form of a minimum payment and a large potential upside can lead the portfolio manager to take excessive risk (whereas a symmetrical linear payment contract can entail low levels of risk-taking). Asymmetrical contracts can also give the portfolio manager an incentive to manipulate results by presenting systematic risk (beta) as unsystematic risk (alpha) (Grinblatt and Titman, 1989). Moreover, empirical findings suggest that an annual minimum payment may give managers who lag behind the benchmark index after the first six months of the year an incentive to take excessively high risk in the second half of the year. An annual maximum payment can lead managers who are ahead of the benchmark portfolio early in the year to reduce the risk taken towards the end of the year in order to safeguard their results. This type of behaviour appears to be most prevalent in the case of younger portfolio managers. This in turn may reflect the relative concern of younger managers with building their reputations.

Moreover, the multi-period aspect of delegated portfolio management could pose further challenges for the reputation-related concerns of managers. The fact that managers operate in a competitive market may lead the manager to position herself close to the market consensus rather than following potential private information signals.

Although the use of asymmetrical performance-based rewards involves challenges in the form of both adverse selection and moral hazard, the literature on delegated portfolio management tends towards the conclusion that in general the benefits of offering targeted incentives more than outweigh the costs. More specifically, the interplay between effort and risk-taking in a delegated decision-making structure entails that the general conclusion of agent theory concerning symmetrical reward systems will no longer be valid. Stoughton (1993) shows that a linear contract can result in an underinvestment in efforts on the part of the manager even under different assumptions about the trade-off between reward and results.

Li and Tiwari (2008) find that the inclusion of an asymmetrical element in the fee structure can result in a considerable improvement in the portfolio manager's production of information. The same study shows that on the margins the advantages of incorporating an asymmetrical performance-based fee in the form of improved incentives to achieve will more than outweigh the potential costs in the form of suboptimal risk sharing and distortions in the incentives for the manager to take risk. Moreover, it is the case that the greater the difference in risk aversion between manager/agent and owner/principal, the greater the underinvestment problem and the more there is to be gained by establishing contracts containing an asymmetrical performance-based fee. The relationship between the principal and the agent's degree of risk aversion is also discussed in Stoughton (1993), which shows that a non-linear asymmetrical contract will be the best option if the manager's risk aversion is at least five times greater than that of the principal.

1.4.5 Summary of features of successful active management

- The literature documents several features of successful active management. It is essential to establish a concurrence of interest between the principal and the manager. Investment management affords economies of scale that can be used to establish high-quality human capital. Investment personnel should work within a structure incorporating delegated decision-making authority and the right incentives. Moreover, investment management should be based on a high degree of internal analysis and extensive specialisation and should be implemented through concentrated positions.

2 Investment strategy

2.1.1 *Distinguishing characteristics and advantages*

Active management is a demanding task which involves intense competition with other investors. It is important that the investment strategy is based on the distinguishing characteristics of the fund and the management mandate. These characteristics can provide a basis for investment strategies that differ from those that are appropriate for other investors. They may also provide a basis for advantages in our investment management that increase the probability of generating excess returns.

The most important distinguishing characteristics of the management of the Government Pension Fund Global are the fund's long-term investment horizon and size. Our ambition is to exploit these attributes in the development of our active management strategies.

The fund's long-term investment horizon is of great importance for the choice and orientation of our active investment strategies. A long-term approach requires a capacity to withstand periods of crisis and large fluctuations in the markets. It is crucial that the fund's owner adopts an approach that makes it possible to anchor a long-term active investment strategy which sets us apart from the average investor.

The fund's distinguishing characteristics probably give us greater scope than other investors to implement a strategy of this kind. Unlike most others, we are not dependent on short-term funding, we have no clearly defined obligations, and we are not subject to special rules that can require costly adjustments at inopportune times.

The foundations for long-term investment strategies are the fund's long expected life and the owner's risk-bearing capacity, while their implementation depends on a high degree of stability in the regulatory framework surrounding active management. A long-term approach provides opportunities to:

- Make investments whose underlying value may take a long time to realise
- Be patient in the execution of investments and increase risk-taking only when specific situations arise in illiquid or stressed markets
- Manage systematic risk with a view to improving the long-term trade-off between expected return and risk

The fund's size is its other main distinguishing feature. Size will often be counted as a disadvantage, because some niche strategies cannot be scaled up to generate a significant contribution to performance for a large fund. Nevertheless, size does have a number of advantages that it is possible to exploit:

- Size brings clear economies of scale. The cost base for our management is lower than for most other funds, and we are able to implement new investment strategies with very low marginal costs. Given that we can attain an informational advantage in our management, the cost advantage is crucial for our ability to generate excess return.
- Size makes it possible to implement targeted strategies in areas where smaller funds will find it uninteresting or impractical to deploy resources.
- Size brings bargaining power and makes it possible to secure better terms and more customised products from service suppliers.

Instead of the risk of owners redeeming at inopportune times, the fund benefits from inflows of capital. Necessary adjustments to the portfolio can be performed more efficiently than would be the case without these inflows.

2.1.2 *Investment opportunities for active management*

Norges Bank believes that most markets in which the fund currently invests are nearly efficient. However, there is reason to believe that the degree of efficiency can vary along several dimensions:

- Some markets will be less efficient than others, and active decisions will provide us with greater opportunities to obtain good results in these segments of the financial market.
- In periods of high volatility or reduced access to funding, a market that is normally efficient can present opportunities for an investor with risk-bearing capacity, solid funding and a long-term management approach.

- As an investor with a global investment universe, we can use active decisions to exploit persistent inefficiencies and discrepancies in the pricing of risk that can arise as a result of market or investor segmentation.
- There may be a premium in being able to apply a longer time horizon than other investors can.

2.1.3 Specialisation, diversification and delegated decision-making authority

Our investment strategy for active management is realised through three organisational principles. We attach importance to developing specialist expertise which is allowed to take independent investment decisions within a structure with delegated decision-making authority.

- Specialisation is necessary to develop expertise which can give us an advantage in collecting or analysing available information. With this specialist expertise, concrete investment decisions can be taken on the basis of our own analysis and independently of information that is publicly available.
- Delegation of authority is important to ensure that this informational advantage is reflected in investment decisions. Within the limits set for the individual portfolio manager, there are no committees influencing investment decisions. Purchases and sales of securities and decisions on external managers are made by the relevant portfolio manager in a structure with delegated authority.
- A diversified mandate structure promotes independent decision-making processes and reduces the risk of different mandates being exposed to the same underlying risk.

Our organisation of active management is in line with the features of successful active management described in the literature.

2.1.4 Norges Bank's main strategies

Financial markets are constantly evolving. The scope for different active strategies is considerable. One example of this is the strategy classification from Hedge Fund Research (HFR), which presents various

active strategies used by this group of investors (see Section 4.3). As an active investor, we must be willing and able to adapt to new opportunities. At the same time, we need to evaluate the strategies that we are actually using, and whether we are still justified in expecting them to add value to the fund. Investment strategies are established by the Executive Board through annual investment plans.

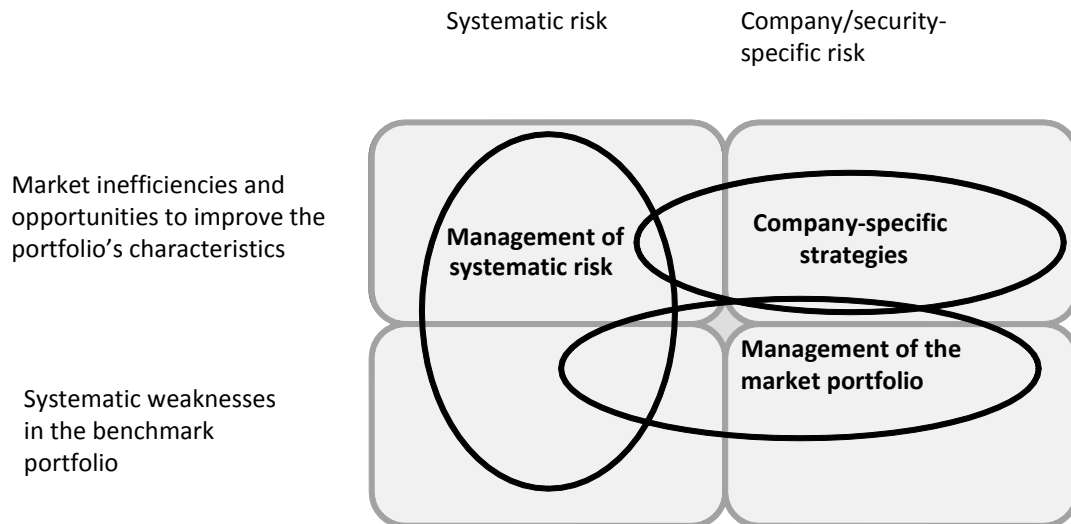
The decision on whether the risk limit for a strategy should be decreased or increased is an investment decision that requires an element of judgement. Historical return data and statistical analysis are of limited value in verifying whether a strategy should be included as part of our active management. Investment processes which appear to be verifiable will often have limited volatility but be exposed to systematic risk and larger losses than historical variations in return would indicate. Strategies with a lower expected information ratio cannot be verified within an operational time horizon of 3-10 years. They may, nevertheless, play an important role in the composition of active risk-taking. A qualitative assessment of the strategy and expected return must therefore be used.

In the following, we describe the implementation of Norges Bank's investment strategy through three main processes:

- The management of the market portfolio, where we take an active approach to the investment decisions involved in efficient management relative to a benchmark portfolio. The fund's size presents major challenges, because large transactions will impact on the market. At the same time, our size gives us opportunities to obtain specially customised solutions.
- The management of strategies based on analysis of securities issued by individual companies as part of their debt or equity financing. Low costs are a particular advantage here, but we believe that there is also potential in adopting a longer investment horizon and a more ownership-oriented investment style.
- The management of systematic risk, where we aim to exploit the fund's exposure to systematic (or aggregate) risk. Investment decisions in this area are taken with a view to increasing returns and improving the long-term trade-off between expected return and risk. The fund's long-term investment horizon and risk-bearing capacity have particular potential in this area of our investments. We aim to ensure that exposure to systematic risk factors increases when premiums are high, and decreases when premiums are low, rather than vice versa.

Figure 1 illustrates how these strategies are distributed in terms of exploiting systematic or company-specific risk, and whether the basis for risk-taking is opportunities arising in the market or opportunities arising as a result of developments in the benchmark portfolio.

Figure 1: Main strategies



2.1.5 Expected returns

An assessment of expected returns from the various main types of investment strategies can, to some extent, be illustrated on the basis of Figure 1.

- In the management of market exposure, considerable importance is attached to cost-effective solutions. There may be numerous different positions, but these will often have the characteristic of being based on relative value considerations. The more attractive of two securities with otherwise identical characteristics will often be the one that is least liquid. Although positions may be based on company/instrument-specific information, they will, from experience, be exposed to underlying commonalities. Extensive risk-taking in this area, possibly with the use of leverage, will be characterized by the management of systematic risk. The potential for returns from this type of management is normally limited, but it will deliver solid results with high levels of stability in normal markets.
- In the management of strategies based on company/instrument-specific risk, we expect greater contributions in the form of risk-adjusted return. Here, there is the potential for many independent positions based on specific information. The potential for returns is considerable,

and the distribution of returns is more symmetrical than for other strategies, in the sense that gains and losses will be more evenly distributed around the mean. These strategies are the most cost-intensive, because they require specialist expertise to be properly implemented. The sum of all these independent positions will, nevertheless, result in some systematic risk which needs to be managed at portfolio level.

- Exposure to systematic risk will often dominate the return on a large fund over time, even if investments are well-diversified. Section 2.4 discusses the management of systematic risk factors. We approach this from a number of different angles. First, systematic risk will arise from our fundamental strategies. We have a positive return expectation for this risk, and it is managed from a risk perspective. The opportunistic approach to systematic risk that we will describe has a relatively high risk, but can have an attractive return distribution if the positions are timed correctly. Finally, we discuss a dynamic exposure to systematic risk factors that aims to improve the trade-off between risk and return. This approach to risk-taking has a relatively large impact on the fund's returns.

Box 1: Expected return from our active management

The excess return that we aim to generate through active management is represented in (1) and consists of the sum of the risk-adjusted return on company/instrument-specific risk, plus the sum of the return on exposures to systematic risk, included or not included, in the benchmark portfolio, plus the return on exposure to the benchmark portfolio, less transaction costs from implementation.

Our goal is to generate an expected excess return after costs of 25 basis points over time. Given expected tracking error of 1 per cent, this means that the excess return can be expected to lie in the interval between -2.75 and 3.25 per cent, but with potentially larger variations in extreme markets.

$$(1) \text{ Excess return from active management} = \alpha + \sum_{i=1}^n \beta_i F^{REF} + \sum_{j=1}^n \beta_j F^{NOREF} + \beta BM - TC$$

α = Risk-adjusted excess return

β = Exposure to systematic risk factors

F^{REF} = Return on risk factors represented in benchmark portfolio

F^{NOREF} = Return on risk factors not represented in benchmark portfolio

BM = Return on benchmark portfolio

TC = Transaction costs

The excess return from a passive management strategy (2) consists of the sum of the return on the benchmark portfolio, less transaction costs from implementation. As a result, the return on a passive strategy will always be lower than the return on the benchmark portfolio. Below, we have estimated transaction costs at 5 basis points and the excess return from a passive strategy at -5 basis points. With today's exposure to emerging markets and small-cap equities, this has to be considered an optimistic estimate of the expected excess return with a passive indexing approach. This estimate assumes that the manager is given a degree of flexibility to adjust judiciously to index changes and inflows of new capital. If the manager is not afforded such flexibility, the transaction costs and negative excess return from a passive strategy may be substantially higher.

$$(2) \text{ Excess return from passive management} = BM - TC \approx -5 \text{ bp}$$

2.1.6 Limits for active management

Norges Bank operates within a limit for active risk of 1.5 per cent expected tracking error. This is the only explicit rule governing the management of the fund which can, in a given situation, force the management of the fund to make sub-optimal investment decisions in the short term.

Positions that have low risk under normal market conditions may be more volatile in stressed markets. If, in an extreme situation, we estimate a tracking error above this limit, this could lead to us being forced to close positions at inopportune times. It is therefore important that the relative risk in the management of the fund is not estimated in a way that is greatly influenced by short-term market movements. Tracking error should be calculated using a method that coincides with the investment horizon. For a long-term strategy, it may be more appropriate to have a measure of expected risk levels under normal market conditions rather than an absolute limit.

The strategic benchmark portfolio for the Government Pension Fund Global is long-term, while a number of active strategies will have a short time horizon. The fund's distinguishing characteristics can best be exploited if, in its management of the fund, Norges Bank also aims to exploit opportunities that have a longer time horizon than is usual for active strategies.

Systematic risk factors often have a skewed return profile which can result in large short-term negative variations in return. It is important that an investment strategy which aims to exploit systematic risk is properly communicated, understood and anchored in the governance structure. In the long term, it will probably be a considerable cost to the fund not exploiting opportunities for systematic risk-taking.

2.1.7 *Organisational requirements for successful active management*

An effectively operating organisation is important for success in active management. Norges Bank is organised with delegated decision-making and a high degree of specialisation among its portfolio managers, who base their decisions primarily on internal analyses. Skilled employees, appropriate incentives and low costs are factors of a more general nature that need to be given importance in the organisational setup.

2.1.7.1 *Human capital*

Employees' expertise is crucial for investment management results. The recruitment of qualified and competent personnel for all functions is therefore a priority for Norges Bank. We believe that an element of active management is important to attract quality personnel to all parts of the organisation, and not only in areas with direct investment responsibilities. Norges Bank is an attractive employer because its management mandate is long-term, the organisation is stable, and there are clearly defined goals for the management of the fund.

Norges Bank has one dominant client. Managers can concentrate on investment management and are given sufficient resources and support in their analytical work.

The fund's long time horizon makes it possible to recruit and train talented young people. We have launched a talent programme for young employees which gives them a thorough introduction to our entire operation. Norges Bank has offices in Oslo, London, New York and Shanghai. Our global presence enables us to recruit specialist expertise in these financial centres. We have an organisation with a delegated decision-making structure, where individuals are given the opportunity to specialise in a limited area.

Norges Bank believes that a performance-based remuneration system is important to attract and retain skilled managers and other key personnel. The appropriate balance between fixed and variable components may vary between different groups of employees, depending on their role in Norges Bank's investment activities. There are upper limits on both fixed and variable pay for all employees. These will vary between categories of employees and will be tailored to the local market in which the employment contract was concluded. Performance-based pay for professionals at investment and management level is based on results over a number of years.

Norges Bank's system for performance-based pay is designed to promote effective management by the Bank's board and management, sensible risk-taking, and effective supervision by the fund's governing bodies. The remuneration structure and pay practices should promote effective and sensible risk management in line with the risk limits and targets established for Norges Bank's investment activities. Norges Bank's Executive Board has set up a separate, advisory remuneration committee consisting of two external members. The remuneration system is in line with internationally recognised principles for sound remuneration and incentive systems.

2.1.7.2 *Low operating costs*

Keeping costs low has been an important goal for Norges Bank ever since the fund was established. Some costs will be dependent on assets under management, while other costs depend on the size of the management organisation. Net earnings are the ultimate measure of performance, and so costs and income in investment management must regularly be weighed against each other.

CEM Benchmarking Inc. (CEM) assists the Ministry of Finance in its evaluation of the management of the fund. The figures below are taken from CEM's report dated 29 September 2009 covering the period from 2004 to 2008. Figure 2 shows the fund's total costs and costs in the two main categories of *Investment management* and *Oversight, custodial and other costs*. The fund has managed to keep costs

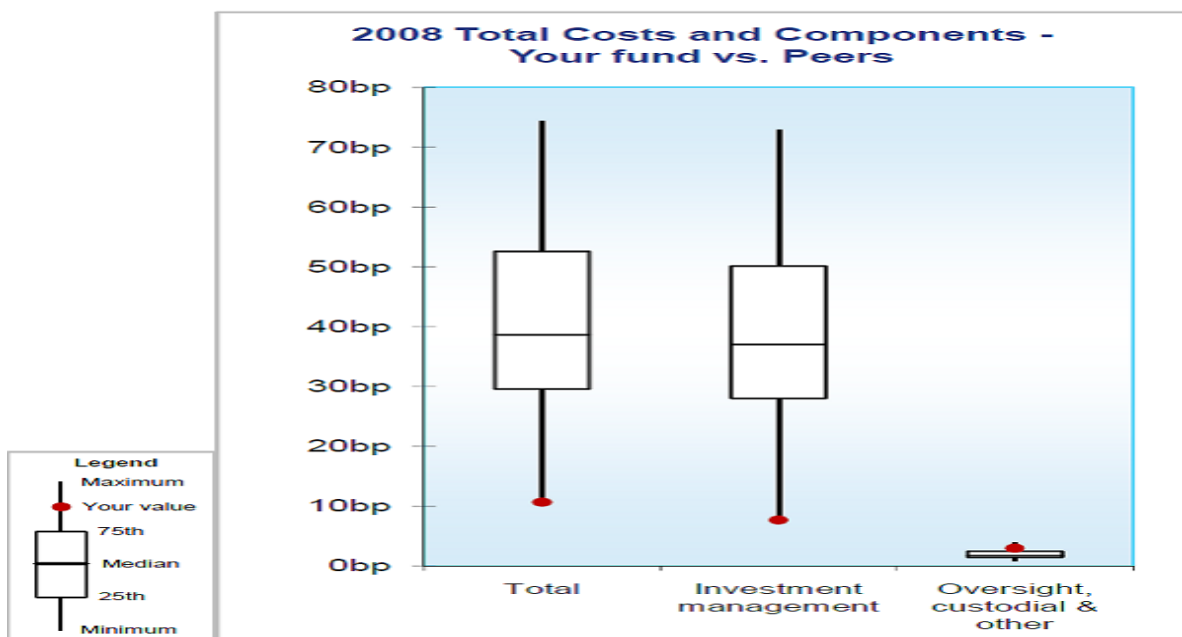
low, with total costs of 10.6 basis points, of which 7.7 basis points can be attributed directly to investment management and 3.0 basis points to general control functions. While we are at the upper end of the sample in terms of costs for control functions, low management costs mean that total costs are at the lower end of the sample¹.

Figure 3 shows Norges Bank’s total costs in relation to both comparable funds and the benchmark portfolio in more detail. The costs for the benchmark portfolio are defined in CEM’s report as follows:

“an estimate of your total operating costs assuming that you paid the peer median cost for each of your investment mandates and fund oversight”.

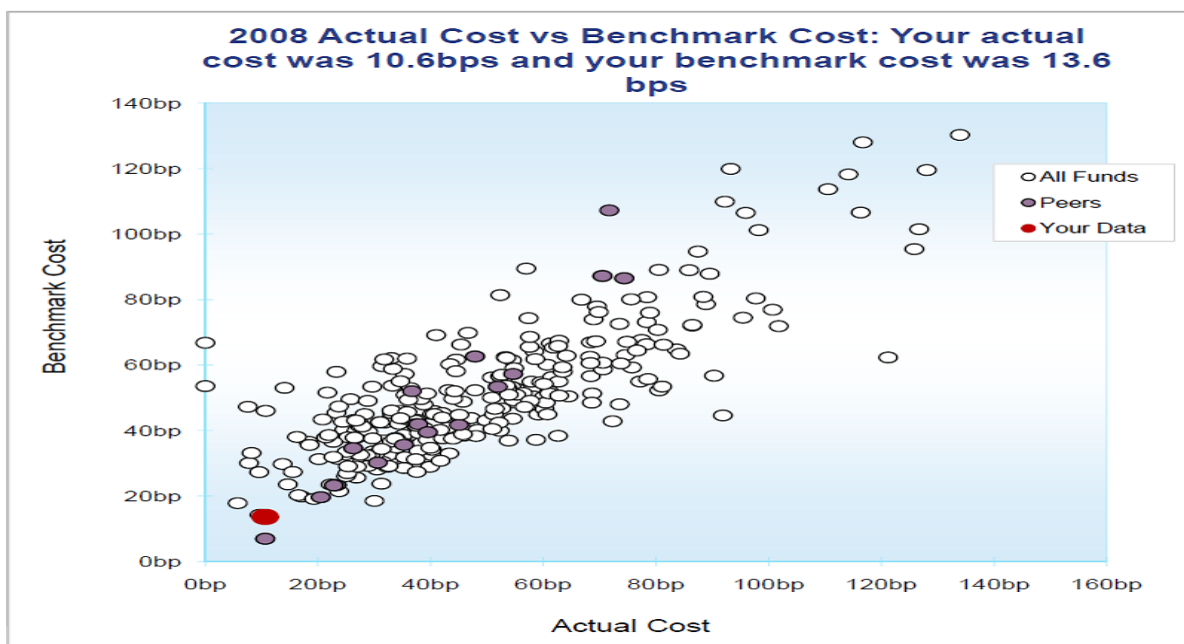
Norges Bank’s total costs in 2008 were 3 basis points lower than CEM’s estimate of total costs for the management of the benchmark portfolio as defined in CEM’s report. This is equivalent to approximately EUR 75 million.

Figure 2: The fund’s total costs in 2008 relative to comparable funds (source: CEM).



¹ For a more detailed description of what is included in the various cost categories, see page 78 of the report from CEM.

Figure 3: The fund's total costs relative to the benchmark portfolio and comparable funds (source: CEM)



Operating costs for the management of the fund (excluding fees to external managers) are attributable mainly to the management of the market portfolio. These costs are estimated to account for around 85 per cent of total management costs. We believe that a switch to passive index management would reduce operating costs (excluding fees to external managers) by approximately 15 per cent, corresponding to 1-2 basis points of assets under management. It is mainly staff costs that can be reduced somewhat through passive management. Staff-related IT costs can also be reduced. Figure 4 is an attempt to illustrate the relationship between management costs and market value. Our management of the market portfolio is best described as semi-active management.

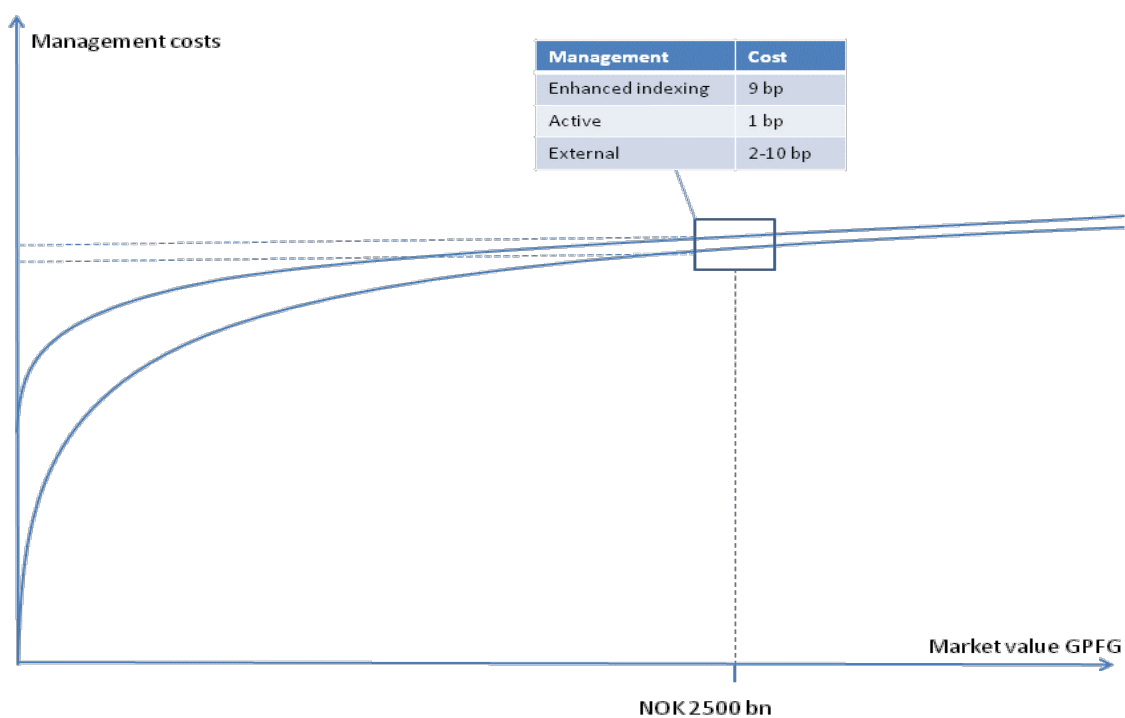
Custody, settlement and accounting are significant cost components in the management of the fund. These are costs which depend largely on the value of the portfolio. Costs of this type currently account for around a third of the fund's total operating costs (excluding fees to external managers).

Staff costs – salaries, performance-based pay, employer's contributions and so on – account for just under 25 per cent of total costs (excluding fees to external managers). The number of employees outside the investment departments depends largely on assets under management. This applies to employees in trading, control, operating and administrative functions. The number of employees in the investment departments will depend on management style, and a passive market portfolio could be maintained with slightly fewer employees in the investment departments than we have today.

Costs for IT infrastructure, IT hardware, software, licences, information systems and so on account for around 15 per cent of total costs (excluding fees to external managers). Assuming that the market portfolio is managed internally, there will still be a need for the same IT infrastructure, trading platforms and information systems. Costs of this type will, to some extent, depend on the number of employees, and may therefore fall slightly with fewer employees.

Norges Bank currently has offices in all major time zones. Global presence and expertise are key requirements for effective investment management. The cost of operating these offices will therefore be independent of the management approach.

Figure 4: Management costs relative to market value



2.1.7.3 Transaction costs

Norges Bank incurs transaction costs in connection with phasing new capital into the fund, internal index management, internal active management, and trading in connection with funding and de-funding externally managed portfolios. Trading encompasses securities such as equities and bonds plus derivatives and foreign exchange. Phasing new capital into the fund is one of Norges Bank's core tasks. We aim to keep the cost of this as low as possible.²

² A feature article in the annual report for 2004 provides a more detailed review of transaction costs in connection with phasing new capital into the fund.

The literature in the field underlines the importance of transaction costs for investment results. Freyre-Sanders et al. (2004) provide an overview of transaction cost models. Carhart (1997) puts observed persistence in equity fund returns down to exposure to common factors in equity returns and consistent differences in transaction and other costs ahead of good stock-picking. Chan and Lakonishok (1995), Keim and Madhavan (1997) and Keim and Madhavan (1998) look at variation in transaction costs for a selection of institutional equity trades and show that transaction costs vary partly with investment style, trading strategy and various equity-specific factors.³

Box 2: Transaction costs

Transaction costs are divided into direct and indirect costs. Direct transaction costs include settlement costs and commission to brokers and other counterparts who assist in executing trades. In some countries, taxes or duties are also paid in connection with purchases and sales of securities. Indirect transaction costs are more difficult to measure ; they are equal to the difference of the price at the time the order was submitted and the price at which the security was traded. Indirect transaction costs can be divided into liquidity costs, market impact, and opportunity costs.

When new externally managed portfolios are established, Norges Bank itself performs most of the trades to transfer capital to these portfolios. Similarly, Norges Bank will take over portfolios and trade them back to the index when external management mandates are terminated. An assessment of the expertise of the external managers' trading teams is a distinct element in the selection and follow-up of external managers.

Cost-effective trade execution in the fund is very important. Trading in securities, derivatives and foreign exchange is centralised in our trading team. On the equity side, traders specialise by sector or trading method (such as electronic transactions or illiquid trades). On the fixed income side, traders specialise on the basis of instrument and geography. We continuously analyse transaction cost data for all trades.

The roles of portfolio manager and trader are clearly separated. Traders have ownership of execution. This is combined with an incentive system that is more quantitatively-oriented than what is usual in the market and rewards a cost-effective trade execution.

³ Some empirical studies indicate that there are institutional traders who manage to deliver consistently lower transaction costs than the average. These studies include Anand et al. (2009), who look at various explanations for this, such as choice of broker, trading strategies and commissions.

We have previously highlighted size as one of our advantages in the management of the fund. When it comes to transaction costs, however, the picture is mixed. On the one hand, there are economies of scale in the gathering of information and trading systems investments. The fund's size and trading volumes also make it worthwhile for Norges Bank to be a direct member of some exchanges, which will be neither practical nor financially viable for a smaller investor. In addition, the fund's size and trading volumes make it possible for Norges Bank to be a member of various exchanges where it can trade directly with other institutional investors. This can be an important source of liquidity for large orders. The fragmentation of the market following the introduction of the EU's MiFID directive⁴ is increasing the importance of having good trading systems and access to many different sources of liquidity. The fund's size and reputation also bring bargaining power in dealings with investment banks and other relevant counterparties. The combination of size and a long-term investment strategy can help Norges Bank receive large allocations in initial public offerings and new issues, where we will normally receive a discounted price to the price expected to be traded in the market. Size will therefore help to reduce overall operating costs and direct transaction costs. On the other hand, size may lead to higher indirect transaction costs, as the degree of market impact increases with the size of trades. This is discussed in the literature – see, for example, Almgren et al. (2005) and Gerig (2007). Chan et al. (2009) analyse daily transaction data for active equity managers in Australia and find that total market impact costs are larger for large funds than for small funds. Norges Bank aims to organise its trading activities in such a way as to keep costs as low as possible, even as the overall size of trades increases.

Active management means larger overall trading volumes and better opportunities to conceal flows when phasing in capital. This may help to reduce the costs associated with phasing in new capital. In addition, traders who build up expertise in trading illiquid large orders for internal active managers will be able to use this expertise to trade illiquid segments of the index portfolios at the lowest possible cost. Large volumes internally also make it possible to cross trades internally, without having to go to the market to find liquidity. As noted earlier, index management will result in various instances of purely passive adjustments pushing up total transaction costs for both the fixed income and equity portfolios. The transaction costs associated with phasing in new capital and indexing the portfolios may therefore be higher without an element of active management.

Liquidity in the market varies over time. This results in an uncertainty for investors for which they will want to be compensated for bearing. The fund's long-term investment horizon provides Norges Bank the opportunity to capture liquidity risk premiums. Norges Bank can be more patient in the execution of

⁴ MiFID stands for the Markets in Financial Instruments Directive and is an EU directive which aims to harmonise the rules for investment services across the EU and EEA. The main aim of the directive is to promote competition between suppliers of this type of service and protect consumers' interests.

trades and will not need to trade at disadvantageous prices due to liquidity needs to the same extent as the average participant in the market. Norges Bank is therefore able to hold illiquid securities which high-frequency traders will avoid due to the high transaction costs for each trade.

Low transaction costs can give the fund a competitive advantage in its active management and provide potential for an excess return net of transaction costs.

2.1.8 Summary – investment strategy

- It is a particular strength of the management model that there is close alignment of interests between the fund's owner, namely the Ministry of Finance on behalf of the State, and Norges Bank as manager. The owner's approach makes it possible to establish a long-term active investment strategy which sets us apart from the average investor. The fund's long-term investment horizon makes it possible to withstand periods of extreme movements in capital markets. This attribute is only to the fund's advantage if there is stability in the regulatory framework surrounding active management.
- There are a number of distinguishing characteristics of the management of the fund which can provide an advantage in its active management. The fund's size brings economies of scale and bargaining power. We are independent of external financing and regulatory regimes and do not need to adjust investments to fund specific obligations.
- The investment strategy aims to exploit possible inefficiencies in financial markets. Some markets are more efficient than others, but mispricings arise at irregular intervals even in the more efficient markets. They may persist between market segments with a different investor base. There may be a premium in applying a longer time horizon to investment decisions than many other investors can. The strategy should also aim to improve the trade-off between expected return and risk through more explicit and active management of systematic risk.
- Our investment strategy for active management is realised through three organisational principles.
 - 1) It is important to develop specialist expertise which is allowed to take independent investment decisions within a structure with delegated decision-making authority.

2) Appropriate design of incentive structures with delegated responsibility for performance is important in active management. Our incentive systems have been designed in line with international principles.

3) Transaction costs reduce the return of the fund and need to be kept as low as possible. The largest cost components in investment management are custody services, information technology, decision support, and salary and staff costs in the core functions. Internal costs for active management are relatively marginal. Costs for external active management account for a substantial part of the cost base, but need to be weighed against the income from this management over time. The fund's distinguishing characteristics, such as its size, long-term investment horizon and inflows of new capital, can be used to reduce transaction costs.

2.2 Management of the market portfolio

The benchmark portfolio for the Government Pension Fund Global can be viewed as a proxy for the owner's appetite for risk in the management of the capital in the fund. The benchmark portfolios for equities and fixed income instruments should, in principle, reflect the investment opportunities in each asset class. In practice, however, the existing benchmark portfolios have weaknesses. This applies both to how representative these portfolios are of the broader securities universes and to how they change.

Opportunities for the fund may also arise as a result of market segmentation. We take active decisions to ensure cost-effective management of the market portfolios of equities and fixed income instruments. We refer to this strategy as the management of the market portfolio.

2.2.1 Biases in the benchmark portfolios

2.2.1.1 The benchmark portfolios' representativity

An investment in bonds gives the investor exposure to a term premium and a credit premium in addition to the risk-free interest rate. The motivation for investing will therefore be to capture these premiums to some extent. The market for fixed income instruments consists of bank loans, syndicated loans, bonds of various types, structured products, and derivatives of various types. The interest paid by the borrower will be either fixed or variable. Loans will normally be awarded a rating based on the borrower's creditworthiness, from sovereign states through to companies on the verge of bankruptcy. The size of the loans issued varies. Two otherwise identical loans may differ from each other in terms of

whether or not they are public. Another difference between two otherwise identical loans may be the degree to which covenants of some kind are attached to the actual loan beyond the interest rate and repayment profile.

The benchmark portfolio for fixed income management is the Barclays Capital Global Aggregate Index, which consists of approximately 10,600 bonds. The benchmark portfolio includes only public bonds which have a rating higher than BBB and a minimum amount outstanding equivalent to EUR 300 million. The benchmark portfolio includes no bonds with less than a year to maturity. Nor does it include any loans with a variable rate of interest or bank loans. The benchmark weights of each bond is calculated based on the notional value of bonds outstanding in the categories included in the benchmark portfolio. This means that issuers with relatively large amounts of debt are allocated a high benchmark weight, and that a passive manager will therefore automatically end up lending large amounts to issuers with high debt ratios.

The benchmark portfolio encompasses only a limited part of the investment opportunities in fixed income instruments. The rating criterion means that a passive investor will very rarely be exposed to bankruptcy risk unless a company goes directly from a BBB rating to bankruptcy. A passive manager will not therefore be able to collect any premiums arising as a result of this change in rating. A passive manager will also be forced to sell bonds a year before maturity without necessarily having any economic justification for such a sale since the index automatically removes these bonds from the benchmark when the bonds have 12 months maturity remaining. Taken together, this means that there are questions over whether the benchmark portfolio accurately reflects the characteristics that an investor is seeking from an investment in bonds.

The benchmark portfolio for equity management is defined as the FTSE Global Equity Index Series (GEIS). The index consists of around 7,300 equities and covers almost 98 per cent of the investable market value of the world's listed equities. The index is believed to be a reasonable approximation of the investment opportunities in this asset class.

2.2.1.2 *Changes to the benchmark portfolios*

In order to achieve the most efficient management and the lowest transaction costs, a manager should have more scope to deviate from the benchmark portfolio due to the way that the benchmark portfolios change. One example of this is that bonds which no longer meet the rating criterion due to a downgrade are removed from the benchmark portfolio at 5.15 pm CET on the last trading day of each month. At the same time, bonds that have been upgraded and now meet the rating criterion are included. It is often normal to observe considerable price variations at this time. A manager can reduce his overall transaction costs by choosing not to execute these particular transactions at that time.

Another weakness relating to changes to the benchmark portfolio is the way in which new issues are handled. It can take up to a month from a bond being issued for it to be included in the index. A passive manager will have to wait to buy this bond until the final trading day of the month in question. If the manager has scope to deviate from the benchmark portfolio, however, it is possible to collect a premium by purchasing the security during the new issue process. Alternatively, a manager can reduce his transaction costs by not purchasing the bond in question in the secondary market at the same time that it is included in the benchmark portfolio.

The benchmark portfolio does not take account of an issuer's loans that fall outside the benchmark portfolio, be these bank loans, syndicated loans, floating-rate loans or bonds placed in the private market. This means that the benchmark weight may give a distorted picture of the issuer's total debt. High debt ratios can be a risk factor. A passive manager will have to accept the benchmark weight, whereas an active manager can choose not to lend, or to lend less, to issuers with high overall levels of debt.

In addition, the benchmark portfolio does not differentiate between the liquidity of different bonds. Experience shows that there can sometimes be considerable differences in the liquidity of different bonds. A passively managed portfolio is forced to trade in bonds which may be difficult to trade when rebalancing the portfolio. This pushes up total transaction costs.

A minimum transaction size has been defined for bonds included in the benchmark portfolio. If a manager is to hold all of the bonds in the benchmark portfolio, this requires a certain size transaction for all trades in and out of the benchmark portfolio. In practice, depending on the size of the fund, such a requirement may be impossible to meet as it might deviate from the minimum transaction size. In addition, the benchmark portfolio is not adjusted for some bonds not being available in the market. There will therefore be deviations between the benchmark portfolio and the actual portfolio even for a passive manager.

Due to the factors discussed in this section, passive replication of the benchmark portfolio will result in high transaction costs. The return on the actual passively managed portfolio will be lower than that on the benchmark portfolio. For a participant of Norges Bank's size, mechanical adjustment to all changes must also be assumed to have a negative price effect, as all adjustments must then be made at a predetermined time. Petajisto (2008) shows that index management which mirrors the index through mechanical purchases and sales at given points in time will entail substantial hidden costs for clients.

Box 3: More about the strategy for the management of the fixed income market portfolio

Index changes

All changes to the benchmark portfolio are made on the last trading day of the month at the market prices observed at 5.15 pm CET. New benchmark weights are calculated, all eligible bonds issued in the previous month are included, and all bonds that are no longer eligible for the benchmark portfolio are removed regardless of their liquidity and price. In practice, it is impossible to rebalance the portfolio in line with new weights at the month-end, as this would entail trades in each of the index's 10,500 bonds. Norges Bank attempts to spread these transactions based on flexible strategies that take account of internal forecasts for inflows and outflows of capital, and changes in supply, demand and prices in the market. Passive management will be based on applicable index criteria determining the market-efficient portfolio, and the credit rating agencies' ratings will then dominate. Norges Bank is of the view that emphasis should also be given to qualitative assessments when it comes to index changes resulting from rating changes.

Primary market

When a company decides to raise money in the bond market, it will normally use banks as advisers and arrangers of the loan. Through discussions with the company and key investors, the banks identify these players' mutual preferences in terms of maturity, currency and interest rate structure. Through this process, the issuer will gain a good insight into the market's general capacity and interest to take up new bonds. Given its size and long-term investment horizon, Norges Bank will, as a rule, be invited to take part in these discussions. This gives Norges Bank an opportunity to influence the issue volume, price and other terms of the loan. For example, we may be able to convince a company to issue a bond with a term of seven years rather than three, as this could have positive portfolio characteristics for Norges Bank. On other occasions, we may be able to offer a borrower loan capital if it accepts special terms for the bond in question.

As a rule, a new issue from a borrower in the bond market will need to be at a discount to existing outstanding debt due to differences in supply and demand. Over time, this difference will be reflected in the spread between buying and selling prices. Once an issuer decides to go out into the market with a transaction, the details of the transaction will be more or less fixed. The actual subscription process will, as a rule, last only a few hours, and in some cases just a few minutes, as the issuer will often already have secured full cover for his borrowing needs during the initial discussions with key investors. Once the subscription process is over, the bonds are allocated to investors. There are no clear rules on how this process is to be carried out, but it can be said that investors involved in the initial discussions generally receive a more favourable allocation than other investors. After this, the bonds are available for trading in the secondary market, where standard transaction costs, such as the bid-ask spread, apply.

Like the fixed income benchmark, the benchmark portfolio for equities is subject to frequent changes. From the beginning of October 2008 to the end of September 2009, there were approximately 5,500 changes to the index. All changes are assumed to be implemented at the close of markets on the day on which the change is made. A single change in the benchmark portfolio will mean that a passive manager must make small adjustments to each of his assets. A passive indexing approach will therefore entail high transaction costs. The return on a passively managed portfolio must therefore be expected to be lower than that on the benchmark portfolio. To ensure efficient management, the manager should therefore have flexibility when adjusting to changes in the benchmark portfolio. For an investor of Norges Bank's size, mechanical adjustment to all changes must also be assumed to have a negative price effect, as all adjustments must then be performed at a predetermined time. Given our size, it would be practically infeasible to implement this number of mechanical adjustments.

There are reasons to suggest that the actual portfolio should be allowed to deviate from the benchmark portfolio. One example is that the benchmark portfolio does not take account of the liquidity of individual stocks. If the manager is forced to trade illiquid equities when rebalancing the portfolio, this will result in substantially higher transaction costs. Furthermore, a stock will, by definition, be included in the benchmark portfolio in the country in which the company is domiciled under the index supplier's definition, even if the company is listed on multiple exchanges. It is not a given that the principle for inclusion in the index corresponds to where the equity is most liquid. Through active decisions, a manager can assess different equities' liquidity in terms of a possible liquidity premium. Nor does passive index management give the manager scope to adjust to events at an individual company, such as buyback programmes, voluntary takeover bids, or dividend reinvestment programmes. Moreover, a passive manager is not able to participate in initial public offerings (see discussion below in Box 4 on strategies for the management of the equity market portfolio). In many cases, there will be a premium that can be earned in connection with this type of event.

2.2.1.3 *Inefficiency due to market segmentation*

A global, long-term investor should be able to exploit opportunities that arise as a result of market and investor segmentation. In the bond market, opportunities may arise as a result of participants such as life insurers and pension funds being required by applicable solvency rules to adjust the duration of their assets to the duration of their long-term liabilities. These adjustments impact price formation in fixed income markets and open up opportunities for a manager who is not subject to the same restrictions.

It is also possible to position investments to take advantage of mispricings due to market segmentation in the equity market. Investor preferences can mean that equities exposed to the same underlying cash

flows trade at different prices in different markets. Over time, it has to be expected that this discrepancy will be eliminated. A long-term, global investor can therefore benefit from being positioned for this. Another example is price differences between different share classes of equity.

Box 4: More about the strategy for the management of the equity market portfolio

Index changes

When changes are made to the index, all changes are made at the closing price on a given day. When an equity is included in the index, index managers minimise their risk in accordance with their mandate by purchasing in the closing auction. This means that the trading volume is often many times higher than usual, and this naturally affects the price. Nobody wishes to provide liquidity without being rewarded for this. A manager who has the option of making active decisions can therefore benefit from spreading the trade over a longer period in such a way as to benefit from the natural liquidity to be found in the marketplace.

Initial public offerings

When equities are offered for sale ahead of listing on a stock exchange, the price is usually at a discount to the price at which the equity is expected to trade once listed. This discount represents compensation for investors subscribing for an issue where they have no guarantee as to their allocation and will typically be locked in during the period between their subscribing for the share and the share being traded on the exchange. FTSE includes new equities in the index immediately they are issued if the market value of the company exceeds FTSE's published threshold. By way of illustration, six companies were included in the FTSE indices following new issues in 2008 and 11 in 2009. These were normally included at their closing price on the exchange on the first trading day. On average, the price at which these equities were included in the index was 9.4 per cent higher than the issue price. Over time, this issue discount means that, over time, it will probably be beneficial for Norges Bank to participate in initial public offerings. Norges Bank's size and long-term investment horizon make us an attractive shareholder and also mean that, in situations where the companies themselves can influence allocation, Norges Bank can be awarded a larger allocation than our existing holdings might indicate.

Acquisitions

When a company in the FTSE index is acquired, this will normally lead to the company being removed from the index. If less than 90 per cent of the company is acquired (because many shareholders are not happy with the price offered), the company may remain in the index, but with a reduced weight. It is often difficult to be sure of the outcome of a takeover process in advance. Passive indexing means waiting until the outcome is clear, and potentially having to sell the number of shares being removed from the index. Liquidity may be dramatically decreased if a high proportion of shareholders accept the offer.

2.2.2 Expected risk – management of the market portfolio

Norges Bank's management of the market portfolio yields a relatively symmetrical return distribution with a limited probability of losses that cannot be expected on the basis of daily fluctuations in positions. In principle, the positions that Norges Bank takes within this type of strategy will be of a short-term nature associated with index changes and concrete corporate events. In cases where the strategy is extended to encompass index substitution, however, the assumed distribution will change to become asymmetrical with a probability of larger-than-expected losses. Traditional index substitution involves selling an expensive index component and buying an inexpensive index component outside the index with virtually the same characteristics. Typical examples of this are on-the-run/off-the-run trades in fixed income portfolios (newly issued versus older bonds) and different classes of share in equity portfolios. The reason why there is increased asymmetry here is that we take on a liquidity risk, and there may also be situations where we have positions also held by many other participants, known as crowded trades⁵. In isolation, all types of crowded trades will have an asymmetrical distribution and a probability of larger-than-expected losses. Our exposures within strategies for the management of the market portfolio will generally relate to index changes and corporate events, but we will also, to varying degrees, have positions in index substitution. Strategies that have an element of extreme loss risk will be monitored particularly carefully, and there are limits on the size of such positions.

2.2.3 Summary – management of the market portfolio

- The benchmark portfolio for fixed income investments does not fully represent the characteristics of this asset class. The definition of the benchmark portfolio can introduce bias, because it excludes bonds with short maturities, bonds downgraded below a certain ratings level, and floating-rate bonds . Through active management, we can achieve a portfolio which represents the fixed income market in a broader and more cost-effective way.
- We take an active approach to the investments that make up the market portfolio. A passive investment strategy which aims to minimise active risk in the management of the fund will increase costs, because it will force us to make large mechanical adjustments at given points in

⁵ A crowded trade describes a herd mentality where specific positions or trades become extremely popular or common among participants in the market. Should something unexpected happen in this market, many will attempt to sell the same instruments during a short space of time. This will create a situation where there is a rush for the exit, and price variations can be abnormally large.

time. Such uninformed adjustments could be used by other players, such as investment banks and hedge funds, who exploit investors who adjust mechanically to changes in the benchmark portfolio.

2.3 Fundamental strategies

In the fundamental or company specific strategies, we make investment decisions on the basis of analysis of individual companies and the securities they issue as part of their debt and equity financing. The company-specific strategies are implemented both by our own managers and using external investment management organisations.

Internal management of company-specific strategies is closely related with active ownership, because the analysis of individual companies gives us expertise that we can use in our dialogue with individual companies' boards and management.

In our external equity management, we increase the emphasis on markets that we believe to have the greatest potential and where it is impractical or unrealistic to build up sufficient internal expertise. We currently have little external fixed income management activity.

2.3.1 *Internal fundamental fixed income management*

The benchmark portfolio for bond investments is weighted on the basis of market value and has a substantial content of corporate bonds. This market value weighting means that the relative weight of the companies that issue the most bonds will increase. The minimum requirement for inclusion in the benchmark portfolio is based on the ratings issued by the international credit rating agencies and is that bonds must be "investment grade" (S&P BBB-; Fitch BBB-; Moody's Baa3).

The rules for the composition of the benchmark portfolio do not take account of a number of factors that may be of considerable importance for a bondholder's rights to financial and tangible assets in the event of bankruptcy. The benchmark portfolio does not normally differentiate on the basis of jurisdiction, ownership or special covenants attached to the loan. The benchmark portfolio can include bonds issued by a subsidiary with a parent company guarantee, even if the subsidiary is located in a jurisdiction which has weaker regulation of debt issues than is the case for the parent company. Bonds issued by banks' holding companies may have weaker rights to assets than those issued by the bank

itself. A company may have bonds with different levels of collateral due to market conditions at the time of issue. Bonds that appear to be identical may have different priority if one is issued with special covenants.

Norges Bank believes that it is not satisfactory to base investments in corporate bonds exclusively on third-party ratings. Credit rating agencies came in for criticism during the financial crisis, because instruments with a high rating turned out to be risky investments. It is not a given that investors' interests will be adequately served by a system where credit ratings are the result of a process involving borrower, investment bank and rating agency. Investors who had based their decisions uncritically on credit ratings encountered the criticism that they have an independent responsibility to assess the quality of their investments.

Bonds differ from equities in that the investor cannot normally expect a large increase in value. The risk with bond investments is that the loan will not be repaid. An active approach to these investments will be to choose bonds that have better terms than equivalent investments. The quality of our portfolio will then be better than the quality of the benchmark portfolio. Credit risk can lead to substantial negative results in special situations. A portfolio of better quality than the benchmark portfolio will be able to limit such variations.

In our credit analysis of individual companies, we pay particular attention to companies that are downgraded and, above all, companies that no longer meet the minimum credit rating criterion for the benchmark portfolio. Many institutional investors are unable to hold these bonds. We may have a structural advantage in that we are not subject to this type of restriction. We aim to identify companies which could satisfy the benchmark portfolio's criteria at a later date and so provide a basis for future excess returns.

Norges Bank invests in both corporate bonds and equities. In some situations, it may be appropriate to look at our equity and bond investments in a particular company as one in order to achieve the best possible outcome for the fund. This requires specific expertise in the analysis of credit instruments.

2.3.2 *Internal equity management based on company analysis*

The Government Pension Fund Global is a large fund by international standards. For many companies, we are one of the largest shareholders, and we are the single largest investor in listed European equities. The fund's long-term approach means that companies will expect us to monitor their development over a long period.

In our internal equity management, it is crucial that we are in a position to make use of our size and our long-term investment horizon. A long-term investment strategy sets us apart from the average investor and puts us in a position to exploit the opportunities that can arise in a market dominated by more short-term participants. We believe that a long-term investor of our size needs to engage in ownership-oriented investment management.

Norges Bank uses a long-term investment horizon in its company analysis. This is reflected in the organisation of our internal mandates and in the incentive structure for our managers. We aim to promote a long-term ownership role in companies, with good interaction between our active exercise of ownership rights and our active investment management.

2.3.2.1 *Organisation, mandate structure and investment process*

We are retaining our fundamental principles for the organisation of the management of the fund, with a high degree of specialisation and diversification of risk-taking within a structure of delegated decision-making authority.

In view of its global investment mandate, Norges Bank has built up a management organisation outside Norway as well. Today, our portfolio managers work mainly at our offices in London, New York and Shanghai.

Internal equity management is organised by industrial sector. Each portfolio manager is a sector specialist with in-depth knowledge of the value chain and competitive structure of their industry.. This organisation is chosen since the return on individual equities seems to be explained largely by sector-specific factors. Specialist expertise in a particular industry can be applied by a manager across countries and regions.

Norges Bank's analytical coverage of the main sectors of the global equity universe has gradually been extended. We have considerable flexibility in the composition of the individual mandate, and in assessing whether there are parts of these sectors that we particularly want to prioritise in our management. This freedom to evaluate which part of the market has the greatest potential is in itself an advantage.

As a large investor in corporate bonds, we have the ability to look at a company's total capital requirements in aggregate. In some situations, it may be possible for us to exploit this position to achieve positive outcomes for the fund.

2.3.2.2 *Managers, information material and analysis*

To succeed with a strategy based on company-specific analysis, the quality of managers and the design of incentive structures are of crucial importance. Norges Bank recruits analysts with relevant backgrounds from investment banks and other industries. Managers will develop their expertise in a structure that values quality, long-term performance and capacity for independent thought.

The fund is a major shareholder in many companies, and the management of which usually expect us to remain owners for the long term.. It is therefore in our mutual interest to develop a good long-term relationship. The investment horizon for a long-term shareholder coincides with the strategic horizon that companies' management should have.

We attach importance to developing and cultivating the broadest possible range of information sources to performing internal analysis on the basis of this information. We aim to differentiate ourselves from investment banks through the breadth of sources we rely upon for information.

Our managers have a particularly good opportunity to develop a long-term dialogue with company managements, and the quality of this dialogue is founded on our specialists having a global approach and spotting trends that may be of interest for a company to discuss with a large, long-term shareholder.

Norges Bank aims to exercise transparent, principle-based and long-term ownership. We aim to be a reliable shareholder with whom companies can have a long-term and confidence-inspiring dialogue, given that the company managements shares our goal of achieving the highest possible long-term return for shareholders.

Our long-term approach and the size of our investments bring opportunities to influence developments at companies through active ownership. In some situations, active ownership can help to realise underlying value in a way that we can exploit only through active management.

Our internal active management is not based on a specific investment process or a common standard for valuing companies. The potential to adapt the investment process to changes in opportunities is reduced if we institutionalise a particular approach. This flexibility is a real advantage over more commercial investment managers, who must market a set approach and stand by it even if market conditions change.

Norges Bank gives each individual employee an opportunity to develop his or her specialist expertise and decide what is the best analytical tool given that manager's investment outlook and approach. This ensures diversity of the investment process and reduces the risk of group think.

The most important common factor for the internal mandates is that investment decisions are made on the basis of detailed financial and industry analysis, an understanding of individual company strategies, and other company-relevant trends, rather than on the basis of a broader analysis of the equity market.

2.3.2.3 *Portfolio construction and risk management*

Each individual manager is responsible for a small number of investments within a concentrated portfolio. Overall, Norges Bank aims to have a broad and well-diversified portfolio based on the investments made by our internal managers. Each individual manager contributes his or her best investment ideas. Factors such as liquidity and expected volatility in the return on individual positions are handled at a macro level.

In a structure with delegated decision-making authority and independent decision-makers, it is important that there is a strong control function which ensures that the risk in the overall portfolio is sufficiently diversified. To this end, Norges Bank has set up capital allocation, risk management and control functions, which operate independently of the management of company-specific strategies.

2.3.2.4 *Costs*

Low costs are one of our advantages in our internal equity management, as we can use an existing infrastructure. The additional costs for internal management are estimated at around 1.5 basis points. These costs consist mainly of salary costs and various variable costs for custody and settlement. Costs are kept low by executing transactions efficiently and by limiting portfolio turnover through concentrated positions.

Box 5: Environmental challenges can present investment opportunities

Environmental protection rules can affect companies' operating conditions in the form of subsidies and taxes, technical regulations and emissions permits, and building permits and licences for industrial facilities. Environmental protection rules can therefore also impact on companies' industrial opportunities, costs and income potential, and their profitability, risk, strategies and investment decisions.

Major changes to regulatory conditions may affect the valuation of a company's shares, especially if the changes are abrupt and unexpected or if there is uncertainty about the design and impact of the new rules.

One current example of this is the ongoing legislative process in the US concerning emissions of greenhouse gases. Whether the US authorities will introduce trading in emissions allowances, how potential emissions caps will be set, and what subsidy schemes will be established for carbon capture, are factors that could affect costs and investment opportunities for coal-based power generators, among others.

A knowledge and understanding of the climate change issue and its implications for power generators' business opportunities has therefore been one of a number of factors affecting the pricing of these companies' shares for some time. This industry is covered by Norges Bank's active sector strategies.

A number of other factors will also impact on market valuations, such as energy prices, demand, competition, technological advances, marketing, price regulation, and how management's strategies

2.3.3 Active ownership and active management

2.3.3.1 Active ownership

The purpose of our active ownership work is to safeguard the fund's financial interests. We aim to promote good corporate governance and high ethical, social and environmental standards at the companies in which we are invested. Good corporate governance supports the development of profitable operations and ethical awareness, as well as safeguarding shareholders' rights and the equitable distribution of profits.

When investing in a company, shareholders will, in practice, delegate decision-making responsibility to managers whose interests may differ from those of shareholders. The board has both a duty and the authority to play an important role in managing this proxy relationship on behalf of shareholders. This includes supervising management's performance and establishing the company's strategic priorities. A need for the active exercise of ownership rights arises when the board's duties are not being adequately discharged. The exercise of ownership rights is therefore an attempt to realise potential gains by reducing the conflicts of interests that can characterise listed companies [Jensen and Meckling (1976)].

A large fund has a variety of instruments at its disposal in the exercise of its ownership rights. These instruments range from promoting the principles of good corporate governance to voting at companies' general meetings and engaging directly with companies. This engagement might concern the fund's expectations concerning strategic priorities, ownership rights or issues relating to environmental and social sustainability (ESG).

The fund is now the single largest owner of listed equities in Europe. The challenge facing us as a shareholder can be illustrated by the criticism made against institutional investors in the wake of the financial crisis. The Walker Review in the UK highlighted shortcomings in active ownership on the part of UK banks and other financial institutions. Owners had failed to follow up their financial interests. One key message was that large institutional shareholders and the boards of the companies in which they invest have reciprocal obligations:

"The potentially highly influential position of significant holders of stock in listed companies is a major ingredient in the market-based capitalist system which needs to earn and to be accorded an at least implicit social legitimacy. As counterpart to the obligation of the board to the shareholders, this implicit legitimacy can be acquired by at least the larger fund manager through assumption of a reciprocal obligation involving attentiveness to the performance of investee companies over a long as well as a

short-term horizon. On this view, those who have significant rights of ownership and enjoy the very material advantage of limited liability should see these as complemented by a duty of stewardship.”

(A Review of Corporate Governance in UK Banks and Other Financial Industry Entities (The Walker Review), Final Recommendations, 29 November 2009, page 70)

As a large and long-term investor, we have a responsibility to follow up the fund’s financial interests. It is expected of us that we have a sound insight into the companies in which we invest and can engage in dialogue with their management. Among the issues that we may discuss are whether the organisation of investment management has an impact on the efficacy of ownership work and our opportunity to reap returns from our ownership activities.

Box 6: Active management strategies can open up opportunities for active ownership

Norges Bank has reported on its engagement with US energy companies on climate change issues, including in its annual reports for 2007 and 2008. The aim has been to express an expectation that companies will not partake in activities intended to obstruct adequate climate change legislation.

Among other things, we have argued, on the basis of in-depth analysis of the decision-making processes at federal level in the US, that the companies concerned may have more to gain from constructive participation in the design of future regulation than from attempting to block regulatory initiatives. It has turned out, for example, that a group of large power generators helped to lay the foundations for the draft legislation approved by the House of Representatives in June and the drafts currently being considered by Senate. Several of the oil majors appear to have adopted a different approach and are opting instead to concentrate their efforts on the shortcomings of current regulations.

Our top-level contact with these companies has built on our understanding of these companies and their operations as developed through our active investment management, and on these companies having a strong awareness that Norges Bank is an active, demanding and long-term investor.

2.3.3.2 *The efficacy and success of ownership activities*

It is difficult to identify and measure the results of concrete active ownership initiatives. The effects have to be expected to emerge gradually over a long period of time. Karpoff (2001) and Gillan et al.

(2007) highlight the various problems that are associated with measuring the efficacy of ownership activities, based on a substantial number of empirical studies.

In many cases, it will be difficult to identify and date ownership initiatives. While, for example, a vote at a general meeting is easy to date, it is far harder to date ownership initiatives based on direct discussions with companies. Furthermore, it is difficult to establish a causal relationship between active ownership and change. Three alternative ways of defining the effects are increases in shareholder value (in the short or long term), increases in measures of financial performance, and effects on operational or governance characteristics.

These three different ways of defining success have all been subjected to empirical analysis. The majority of studies of the short-term performance impact of institutional investors' ownership initiatives have not found any significant excess return [Karpoff, Malatesta and Walkling (1996), Smith (1996) and Wahal (1996)]. When it comes to long-term performance effects (after 1-5 years), the empirical findings are more mixed. While early studies of the cross-sectional type, such as Del Guercio and Hawkins (1999) and Wahal (1996), did not find any significant positive long-term effects, studies of individual institutions have found some indications of positive long-term effects. One example of this is studies of initiatives by CalPERS: Nesbitt (1994) and Anson (2003) found significant long-term positive equity returns at companies where investments resulted in such initiatives.

Finally, there are some indications of effects from active ownership work targeting specific aspects of operating profit and corporate governance. Del Guercio and Hawkins (1998) conclude that companies subject to this type of initiative show a higher frequency of corporate governance events in the three-year period after these initiatives. Operational changes have also been identified in the wake of active ownership work, especially in connection with sales of assets and reorganisations.

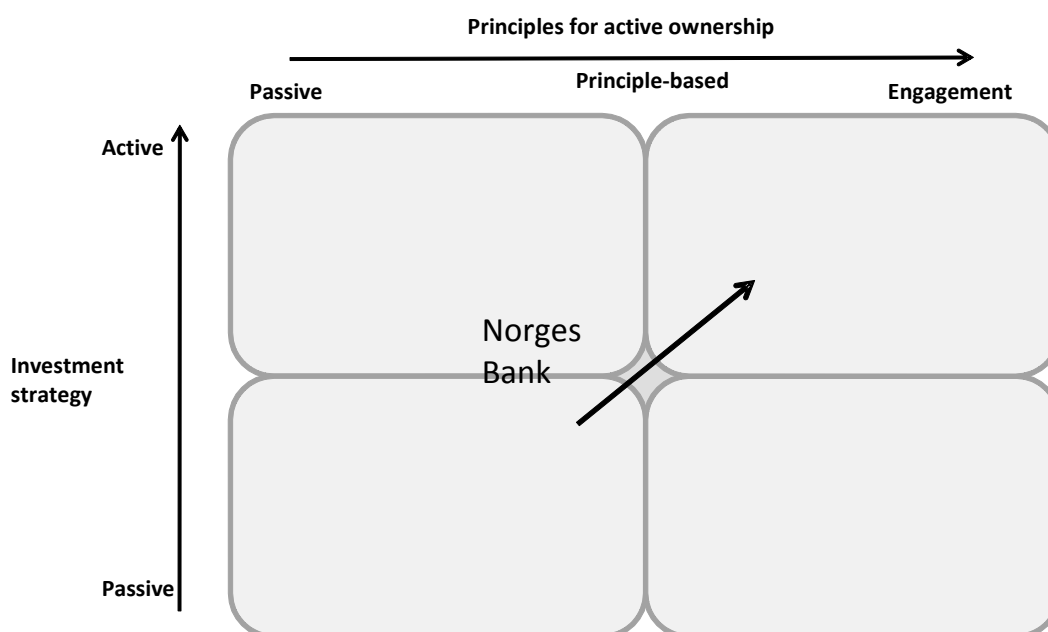
One development in the past decade has been hedge funds involvement in active shareholder initiatives. Empirical studies of these initiatives show more significant positive effects from active shareholder initiatives than has been the case for pension funds and mutual funds. Two recent studies, Brav et al. (2006) and Boyson et al. (2007), find evidence of a significant positive market reaction, in both the short and the long term, to initiatives from active hedge funds. A study by Becht et al. (2008) of active shareholder initiatives from Hermes UK Focus Fund finds a significant positive long-term excess return on the fund's portfolio of companies subject to such initiatives.

There is limited evidence to conclude that active ownership has, in general, delivered results as measured by traditional success criteria. However, the empirical results do indicate that there may be substantial potential for investors to move in the direction of being more active in their ownership.

2.3.3.3 Relationship between ownership role and investment model

Figure 5 illustrates the relationship between various models for the fund's ownership role and investment strategy.

Figure 5: Investment and ownership approaches



Ownership role

By a passive ownership role, we mean that the fund does not pursue its financial interests, but sees itself exclusively as a recipient of the financial return resulting from ownership. With a passive management strategy, the fund will not be able to take preventive action, such as selling a share, in cases where ownership activities do not get results. Even if the issues associated with an investee company are of such a serious nature that this has a significant negative impact on our financial interests, a passive investor will be tied to the index weight.

By principle-based ownership activities, we mean that the fund has scope to exercise its ownership rights, but that this is based mainly on fixed and general principles, such as through voting. Active engagement, at the other end of the scale, means a more opportunistic approach, where the institutional investor's ownership activities are motivated by a specific goal of realising the value of a particular company. This approach may be based on analysis of management-related, strategic or operational shortcomings or capital structure. In between these two ownership models we may identify various combinations involving varying degrees of analytical insight and active engagement with individual companies.

Investment model

Passive investment management means that the manager invests in a portfolio which stays close to a benchmark portfolio. The greater the deviations from the benchmark portfolio, the more “active” the management.

In the category of funds that combine active ownership and active management, we find funds with relatively few, large and long-term investment positions which engage in very active and involved ownership. The combination of active management and active ownership will result in relatively long-term and concentrated positions in order to be able to reap the potential rewards of the active ownership role.

At the opposite extreme of investment models is the low-cost index fund. Funds of this type seek to generate a return close to the chosen benchmark index at the lowest possible cost. Active ownership activities can result in significant costs, especially if they take the form of active dialogue with individual companies, and cannot be expected to generate a corresponding return without active investment positions. This type of passive fund will therefore, from experience, limit its ownership role to cost-effective, principle-based voting.

Norges Bank’s management mainly stays relatively close to the benchmark portfolio, and most of our active ownership activities to date have been principle-based in the form of voting. This puts Norges Bank in the centre of Figure 5. In recent years, Norges Bank has attached greater importance to active engagement with companies. Over time, this could result in the fund gradually moving towards the top right of the figure. It is primarily through long-term investment in individual companies that an investor can expect active ownership to result in higher returns over time.

2.3.3.4 *Relationship between active ownership and active management*

Admati (1994) and Coffee (1992) formulate a theoretical argument that an index manager tied to the market portfolio has an incentive to perform oversight and engage in active ownership activities, because the manager cannot discipline individual companies through exit. The Government Pension Fund Global is a large, long-term investor which will always be broadly invested in the markets, and this theoretical starting point is valid for our investment management with the current investment strategy.

The cost of performing oversight and exercising ownership rights is primarily private, whereas the potential gains from such activities are a common good which is available to all investors. This is an example of what is known as the “free rider” problem. From an investor’s perspective, it is not cost-effective to perform oversight of every single company in a broadly diversified portfolio [Barker (2009)].

Maug (1998) and Kahn and Winton (1998) show that shareholders who have sufficient influence to bring about changes at investee companies should be able to make gains by buying shares at a lower price which does not yet reflect the impact of these improvements. It is also possible, as emphasized in the report by The Albright Group and Chesterman (2008), that issues and problems identified in connection with active ownership can provide information of value in our active investment management.

The key issue is therefore whether the organisation of investment management is significant for the potential to achieve the desired results from active ownership. Active ownership requires expertise. Our internal equity portfolio managers monitor companies closely and have incentives to identify potentially undervalued companies. They may also spot situations where active ownership can release value. An active investment management approach means that the information and expertise needed to be able to exercise the best possible ownership strategy is available in the organisation.

Efficient implementation of active ownership demands considerable company and industry-specific expertise and analytical resources which will be difficult to develop within a passive investment mandate. While an organisation without active investment management will be able to establish a separate division to focus exclusively on ownership matters, it is unlikely that the necessary capabilities will be developed to the level that exists within active management. The ability to recruit qualified individuals, access to information, and the quality of corporate relationships are all enhanced by active management. Without this kind of role, analysts will have less of an incentive to hunt for undervalued companies where active ownership will be of particular value, reducing active ownership to a more general and principle-based function.

A passive investment mandate may create the risk that our ownership initiatives will be viewed as less relevant and less potent. This approach could undermine our legitimacy and negatively influence our dialogue with investee companies.

Given the fund's substantial holdings in individual companies, it is possible to safeguard the fund's interests through targeted engagement with individual companies. The exercise of ownership rights to influence companies is a long-term process, but the fund's long-term investment horizon allows us to be patient. A more active approach and the initiation of active dialogue with companies demands substantial resources and an in-depth knowledge of companies, sectors and markets. Our internal equity management with its active, sector-based specialists gives us the expertise and analytical resources needed to identify and analyse the companies which should be engaged in this type of dialogue. Given that there are substantial costs associated with an active ownership role, active investment in companies will give us the potential to reap the rewards of active ownership.

2.3.4 External equity management

Norges Bank awards external management mandates to organisations with specialist expertise in clearly defined investment strategies. We enter into agreements on concentrated mandates with management companies that we believe have an informational advantage based on company-specific analysis. In recent years, a growing number of these mandates have been awarded in markets that we believe to be less efficient and in which it would not be practical or realistic to build up internal expertise.

The choice of external manager is an investment decision in itself. We base our choice of managers on a number of sources of information and on a thorough review of all parts of the management organisation. We have considerable bargaining power and can obtain favourable terms.

2.3.4.1 Mandate structure

The composition of external management mandates has evolved over time. From a starting point where most external equity mandates were broad regional mandates, we have gradually changed the mix in favour of mandates focusing on industry sectors, on countries and investments in small and medium-sized companies. Today, most externally managed capital is invested in specialised country and sector mandates.

The mandate structure for external mandates is not determined by the size of their respective markets. A larger proportion of the fund is managed externally in markets where we believe the potential for active management to be greatest, and where it is not practical or realistic to build up internal expertise. Conversely, the level of external management is lower in markets where we believe the potential for active management to be smaller. We aim to use managers with capital that is in reasonable proportion to the opportunities within the mandate in question.

We look for local managers or managers with specialist expertise in a particular industry. For example, we currently have external management mandates for Indonesian and Malaysian equities, for Brazilian small companies, and for transport and health care technology. The mandate structure limits overlap between mandates, ensures a high degree of independence in risk-taking, and contributes to a good diversification of risk.

When an external mandate is established, we simultaneously reduce the internal allocation of that mandates sector or country in the market portfolio accordingly. The choice of external managers does not alter the fund's absolute country or sector allocations. The choice of manager is based exclusively on

analyses of the expected return for active risk.

One common factor among our external managers is that they aim to generate excess return by analysing company-specific information better than their competitors. They must therefore have substantial analytical resources in the field in which we choose to employ their services. The mix of suppliers is diverse, and we have limited dependence on specific managers.

At the end of the third quarter of 2009, external equity mandates accounted for around a fifth of the fund's overall equity portfolio.

2.3.4.2 *Sources of information and decision-making process*

Norges Bank is a large, long-term investor in the market for external investment management services. Our size and long-term approach provide an advantage in identifying, selecting and monitoring external managers. We are in a position to negotiate competitive terms and can use substantial resources to interface with the management of the funds.

The choice of external manager is an investment decision which is delegated within our organisation to the relevant portfolio manager. Norges Bank has access to a broad range of information sources when performing assessments. We attach considerable importance to our decisions being taken independently of consultants and third-party evaluations. We make our assessments on the basis of direct contact with potential suppliers' management, investment managers, analysts and traders. We can therefore form a complete picture of the investment management organisation. This process is lengthy and demands a considerable input of resources from the supplier. It will not be practically feasible for them to maintain an equivalent dialogue with many other potential buyers at the same time.

Our flexible mandate structure and extensive risk management put us in a position to invest in new products within established businesses.

Historical returns say little about how results have been achieved, and nothing about the people who contributed to them. Historical performance alone is of limited value when we are forming a picture of the potential for future value creation. We assess managers' historical portfolio and form a qualitative picture of how returns have been generated. Quantitative analyses of historical portfolio data give us a basis for assessing managers' presentation of their own investment process. We can therefore perform analyses of how a new manager might impact on the overall portfolio.

Monitoring existing managers is as important as finding new ones. We assess existing managers' results and risk profile on a continuous basis. We have a good insight into external managers' portfolios through the daily exchange of information on status and transactions. This information is used in our analysis and by our control functions.

2.3.4.3 Returns and costs

The level of management fees is of great importance for the size of excess return after costs external management can generate for the fund in the long term. The fund's size and long-term approach enable us to negotiate low fixed fees. All of our contracts contain an incentive structure which ensures alignment of interests between us and the manager.

Data from Mercer, eVestment and Morningstar's databases show that fund and institutional clients pay, on average⁶, 146 and 52 basis points respectively in fees for the management of equity mandates in developed markets. The corresponding figures for emerging markets have been estimated at 179 and 80 basis points respectively. Our management fees for external management mandates in the same regions are substantially lower. If our managers are reasonably successful in their management and we assume an information ratio⁷ of 0.25 per cent, our total fees (including performance-based fees) for mandates in developed markets are approximately 30 and 80 per cent respectively of what the average fund and institutional client pays. The equivalent figures for emerging economies are approximately 40 and 85 per cent. Available data indicate that our management fees are low relative to the average.

Our experience of external equity management has been positive. It has generated an excess return in nine out of eleven years (Section 4.2.3 presents the time series for this activity). Since the inception of the fund, external equity managers have made a net contribution of around NOK 13 billion.

2.3.5 Expected risk – management of company-specific strategies

⁶ Average refers here to the median investor.

⁷ The information ratio (IR) is a widely used measure for calculating a manager's excess return to the risk he has taken relative to the benchmark portfolio. The IR is defined as the ratio between excess return and relative volatility.

The fundamental equity strategies will generally have the same distribution characteristics as traditional management of equity portfolios. In practice, we will have a variety of smaller portfolios, which introduces diversification effects. This may mean that we have an overweight of value stocks in this part of the fund, which can, in turn, affect the risk picture. Our external equity management has had a long history of an overweight of growth stocks relative to value stocks. This may partially or wholly offset the fund's overall exposure to this risk factor. In general, the measurement and management of the fund's total exposure to all systematic risk factors will be a very important part of our risk function.

2.3.6 Summary – company-specific strategies

- Our fundamental strategies aim to exploit company-specific risks. A high degree of specialisation, delegated decision-making authority and concentration of positions are intended to ensure that each manager is in a position to attain an informational advantage. We use a long-term investment horizon in our company analysis. In a market dominated by participants concerned primarily with short-term potential, opportunities may open up for long-term, fundamentally oriented investors.
- Successful active ownership is based on the principles of good corporate governance and needs to be realised on the basis of long-term dialogue with individual companies. This dialogue must build on a knowledge of each company's operations and governance structure. The expertise needed for high-quality and effective active ownership is most efficiently gained through active management. In given situations, active ownership can help to bring the management of a company more into line with the owner's interests, and so realise underlying value in a way that the fund can exploit through active management.
- In our external active management, there is increased emphasis on markets that we believe to be less efficient and where it is impractical or unrealistic to build up sufficient internal expertise. Our size gives us an opportunity to develop an informational advantage over other buyers of investment management services. Size brings bargaining power and a cost advantage relative to other investors in equivalent products. Over time, external management on the equity side has made a significant contribution to overall management performance and more than justified the management costs.

2.4 Management of systematic risk

The systematic risk in investment management will typically be an important explanatory factor for an active manager's results over time. The management of systematic risk is essential from a risk management perspective, but may also be viewed as a potential source of excess return through active management of the exposure to the underlying risk factors. The following presents various approaches to the management of systematic risk.

2.4.1 Fundamental approach to systematic risk

Within a structure with delegated and independent position-taking, aggregated exposures to systematic risk will arise. If different strategies are exposed in varying degrees to different sources of systematic risk, this risk is not eliminated through diversification but is aggregated across these strategies.

In our management, we closely monitor such systematic risk exposures from a risk management perspective, using a number of different approaches. We attach particular importance to identifying and analysing exposures to company size, valuation, volatility and credit, but also a number of other potential sources of systematic risk and returns.

If the aggregate exposure at the fund level to specific factors or combinations of factors is undesirably high, we can adjust the overall portfolio structure to change this exposure. The management of systematic risk is therefore closely related to overall portfolio management.

The various components of our management will have different expected exposure to different types of systematic risk. Changes in the composition of strategies and the mandate structure within each strategy area lead to different exposures to systematic risk. The composition of different mandates and the risk limits for these mandates are therefore the most important instrument for risk management in the management of the fund.

Within these constraints, we can allocate capital to markets or market segments that are not represented in the benchmark portfolio if we find this an attractive opportunity for the fund. A number of decisions that have been made in the management of the fund in recent years have made a significant positive contribution to returns. For example, we included small-cap equities and a number of emerging markets in the active portfolio before these became part of the benchmark portfolio.

Similar assessments have led to us withdrawing from, or choosing not to enter, markets which we believe to be risky, despite these being included in the benchmark portfolio. We have, for example, chosen not to invest in a number of emerging markets that are included in our benchmark portfolio, because they do not meet market-related or operational requirements. We regularly review whether we should withdraw from markets in which we are invested. This may happen if the political risk associated with investments becomes too great.

2.4.2 *Opportunistic approach to systematic risk*

One approach we use is to take positions in systematic (or aggregate) risk when we believe part of the market to be out of balance.

We aim to identify these situations, analyse the underlying risk picture, and make investments that generate returns as the market normalises. This analytical approach can put us in a position to exploit the fund's distinguishing characteristics constructively. The definition of the investment universe will be broad. For example, positions in country risk or oil price risk might take the form of currency positions, whereas inflation risk might result in positions in nominal bonds. An assessment of refinancing risk might be reflected in a company-specific credit portfolio.

Opportunities of this kind can arise in extreme, stressed or illiquid markets. Extreme markets can be defined as situations where the pricing of assets deviates significantly from normal levels. A market shock can be triggered by an external event, sudden regulatory changes, or an unexpected and persistent imbalance in parts of the market.

These situations can coincide with stress in markets where there are large structural imbalances, especially as a result of many investors being forced to sell their positions. Fluctuations will be particularly large in illiquid markets.

Situations of this kind will arise at irregular intervals. A manager with a long time horizon will be able to wait for these opportunities to arise, and use them to generate an attractive expected return profile for his investments. Commercial participants with shorter investment horizons do not have the same opportunity.

2.4.3 *Dynamic approach to systematic risk*

Another, supplementary approach is to manage exposure to systematic risk directly. The starting point for this is that investment opportunities vary over time, and risk premiums reflect this. A long-term investor should approach these opportunities dynamically. The aim is then to improve the long-term trade-off between expected return and risk by dynamically increasing the fund's exposure to systematic risk factors that have a high expected return, and decreasing it when the expected return is low.

To the degree that the existing benchmark portfolio does not express all of the risk factors to which the fund should be exposed, we can make investments which provide this exposure. Such an approach may be appropriate for a long-term investor and can be implemented within the framework of our management mandate. A strategy of this kind can have a major impact on excess return in the short term as a result of exposure to risk factors that cause large negative variations in returns for periods. This strategy must therefore be properly communicated, understood and anchored in the management structure.

2.4.4 *Expected risk – management of systematic risk*

Risk can be measured along various different dimensions. In our internal risk budgeting, relative volatility is a key measure. If the expected return distribution shows significant asymmetry, a traditional analysis of risk and return based on relative volatility (information ratio) will not be meaningful. We therefore supplement risk budgeting with the assumed return distribution for the individual management strategy and the fund as a whole. To calculate estimated distribution characteristics, we use a combination of quantitative and qualitative assessments, where the quantitative analysis is based on historical simulations.

Asset allocation in the form of including or removing segments of the market which are not part of the benchmark indices can lead to increased risk and an increased probability of larger losses than can be expected on the basis of day-to-day fluctuations in positions. The reason for this is that, based on both experience and expectations, we will include more segments than we will exclude, and these will generally have a higher risk than the benchmark index.

When it comes to strategies that aim to make allocations when financial markets feature turbulence and a high level of uncertainty, it will, in principle, be difficult to say anything about expected risk. The

number of positions, choice of asset classes, and strategy for establishing positions will affect the risk picture. In general, we will be exposed to liquidity risk and volatility. If positions are established only in very turbulent market situations, this can help to reduce the probability of larger-than-expected losses (extreme events).

2.4.5 Summary – management of systematic risk

- We position the portfolio for systematic risk in a number of ways. The fund's benchmark portfolio evolves slowly, and we invest in parts of the market which are not part of the benchmark portfolio when we believe there to be attractive opportunities. We can also withdraw the fund from investments which are part of the benchmark portfolio if the risk is too great. These assessments lead to active risk, but will also improve the portfolio's long-term trade-off between return and overall risk. Our long-term investment horizon allows us to be patient and increase exposure to systematic (or aggregate) risk as opportunities arise.

3 Summary

The efficient market hypothesis has figured prominently in academic finance in recent decades. Modern financial theory shows that the degree of efficiency can vary over time and between market segments. There is no contradiction between the modern efficient market hypothesis and active management. In contrast, it is essential for a well functioning market that there are investors who take investment decisions based on perceptions of securities' fundamental value. Efficient markets presuppose that informed investors will take positions so that market mispricings are eliminated. This will be both risky and capital-intensive. Modern financial theory shows that risk capacity and capital may entail constraints on the extent of arbitrage and contribute to inefficiencies in financial markets persisting over time.

Investors can categorise securities in various ways, for example by geography or index. Many investors also concentrate on a smaller selection of securities than are investable globally, due partly to transaction costs, trading restrictions, regulations or limited information. This may result in different segments of investors focusing on different parts of the financial market. For a global investor investing in different asset classes, it will be appropriate to consider the level of efficiency in each individual market and the opportunities to exploit mispricings between market segments.

Over the past 20 years, a rising number of new factors have been documented that have been associated with higher returns over time than can be explained by the capital asset pricing model (CAPM). There is not agreement as to whether these factors are an expression of the market being inefficient or an expression of systematic risk in excess of general market risk which is not captured by pricing models. Developments in academic financial theory show that our understanding of financial markets is constantly evolving. New factors will, in all probability, be identified and incorporated before declining in importance. In this light, it is crucial for a long-term investor to have sufficient flexibility to adapt quickly to new insights.

Our review of empirical studies of the profitability of active management in different asset classes indicates that, under given assumptions, it is possible for investors to achieve an informational advantage which can be used to generate excess return. The level of transaction costs and management fees is, however, critical for how much of this excess return accrue to the client.

A traditional benchmark portfolio based on asset classes and regional distribution cannot provide an optimal expression of all known risk premiums. Risk premiums can play out over long periods, and some

can be viewed as compensation for bearing liquidity risk or the risk of extreme events. How and when an investor will be best rewarded for exposure to a given risk factor will also change. As investment opportunities varies over time, a long-term investor should have the flexibility to adapt to this. Active management can improve the trade-off between risk and return, and serve to reduce the overall risk for the fund in many situations.

Various features of successful active management are documented in the literature. It is important to ensure alignment of interests between client and manager. It is a particular strength of the management model for the Government Pension Fund Global that there is close alignment of interests between the manager and the fund's owner, namely the Ministry of Finance on behalf of the State. The owner's approach makes it possible to establish a long-term active investment strategy which sets us apart from the average investor. The fund's long-term investment horizon makes it possible to sustain periods of extreme movements in capital markets. This attribute is only to the fund's advantage if there is stability in the regulatory framework for active management.

The literature also provides support for the existence of economies of scale in investment management that can be used to establish an organisation with high quality standards and skilled employees. Employees should operate in a structure with delegated decision-making authority and appropriate incentives. Fund management should also be based on a high degree of internal analysis and extensive specialisation, and be implemented through concentrated positions. All of these factors features prominently in the way in which Norges Bank has organised the management of the fund.

We currently have three main strategies for active management: management of the market portfolio, management of fundamental strategies, and management of systematic risk.

The management of the market portfolio ensures cost-efficient exposure to asset classes and markets which is close to the owner's benchmark portfolio. The benchmark portfolio in the various asset classes is subject to mechanical rules and has a number of technical weaknesses, and it does not always fully represent the asset class. The latter applies particularly to fixed income investments. The definition of the benchmark portfolio can introduce bias, because it excludes bonds with short maturities, bonds downgraded below a certain level, and floating-rate bonds. Through active management, we can build a portfolio which represents the fixed income market in a broader and more cost-efficient way. We take an active approach to the investments that make up the market portfolio. A passive investment strategy which aims to minimise active risk in the management of the fund would be cost-generating, because it would force us to implement significant adjustments at given points in time. Such uninformed

adjustments could be used by other participants who exploit passive investors who adjust mechanically to changes in the benchmark portfolio.

We also aim to improve the portfolio by analysing individual investments in the companies in which we are shareholders or creditors. This management of company-specific risk builds up expertise and insight into the fund's underlying assets and forms the foundation for our active ownership. Our internal management is based on analysis of individual companies – known fundamental strategies – with specialists in different industries. A high degree of specialisation, delegated decision-making authority and concentration of positions are intended to ensure that each manager is in a position to attain an informational advantage. External active management gives increased weighting to markets we believe to be less efficient and where it is impractical or unrealistic to build up sufficient internal expertise. Size brings bargaining power and cost advantages relative to other investors in corresponding products.

Successful active ownership is based on the principles of good corporate governance and needs to be implemented on the basis of long-term dialogue with individual companies. This dialogue must build on knowledge of each company's operations and management structure. Active ownership can help to bring the management of a company more in line with the owner's intentions, providing the fund with an opportunity to realise underlying value through active management.

We analyse the fund's overall risk characteristics and take account of systematic risk factors along several dimensions. A given benchmark portfolio will not at any time provide an optimal or risk-neutral expression of the owner's investment preferences or risk tolerance. Based on analysis of these systematic risk factors, we manage the fund's overall risk in order to improve the trade-off between return and risk. The fund's benchmark portfolio evolves slowly, and we make investments in parts of the market which are not included in the benchmark portfolio when these opportunities are considered to be attractive. We can also shift out of investments which are included in the benchmark portfolio if the risk is assumed to be too great. These assessments result in active risk, but will also improve the portfolio's long-term trade-off between return and overall risk. Our long-term investment horizon means that we can be patient and increase exposure to systematic (or aggregate) risk as opportunities arise.

Norges Bank currently engages in active management along three main lines. The management of the market portfolio ensures cost-efficient exposure to asset classes and markets which is close to the owner's benchmark portfolio. We also seek to improve this portfolio by analysing individual investments in the companies in which we are shareholders or creditors. This management builds up expertise and

insight into the fund's underlying assets and forms the foundation for our active ownership. We also look at the fund's overall risk characteristics and attempt to improve the trade-off between return and risk in the overall portfolio through analysis of systematic risk characteristics.

Norges Bank cannot recommend a passive investment strategy which does not seek to achieve cost-effective market portfolio, insight into the underlying assets in which we are invested, or an understanding of the overall risk of our investments.

4 Appendix

4.1 Factor model for the equity and fixed income portfolios

In this appendix, we look at the systematic risk factors to which the Government Pension Fund Global has been exposed in the period 1998-2009. The results indicate that both the equity and fixed income portfolios have been exposed to substantial systematic risk during the period.

The annual report for 2008 presented a factor analysis of the equity portfolio. Here, we have updated these calculations and made changes to the choice of size and value factors. As explained in sections 1.1 and 1.2, Fama-French factors are commonly used in studies of this type. However, recent research has identified various problems with these factors. Cremers, Petajisto and Zitzewitz (2008) show that even broad, passive market indices such as the S&P 500 produce a statistically significant alpha when the Fama-French method is used, due to weaknesses in the method used in the design of the Fama-French factors. Huij and Verbeek (2007) note that the Fama-French factors are based on hypothetical equity portfolios and do not take account of transaction costs, market impact and trading restrictions normally faced by investment managers.

For this reason, Huij and Verbeek argue that the factor returns against which equity funds are often measured can be a misleading basis for comparison. As a result, we have chosen to use MSCI's global indices to construct value and size factors for the equity portfolio. The value factor (VAL) is the return on the value index less the return on the growth index, and therefore represents the return on a portfolio that is overweight in value stocks and underweight in growth stocks. Similarly, the size factor (SML) is calculated as the return on MSCI's large-cap index less the return on its small-cap index. As a momentum factor, we have used Kenneth French's UMD factor, as described in section 1.1. Equity markets in emerging economies have different risk characteristics to those in advanced economies. We have therefore introduced the factor EMG, which represents the return on a portfolio with an overweight of emerging equity markets and an underweight of developed equity markets. As a market factor (MKT) for the equity portfolio, we have used the return on the Government Pension Fund Global's equity benchmark.

For the fixed income portfolio, the return on the fixed income benchmark is used as the market factor. This factor will, among other things, be able to capture systematic exposure to the term structure premium, as discussed in section 1.1. As with most other return analyses of bond funds [Blake et al. (1993), Huij and Derwall (2007)], we also use three factors intended to represent the systematic risk from exposure to different corporate bond market segments. The factor CR1 represents the return from being overweight in corporate bonds with a credit rating of Aa and underweight in government bonds.

Similarly, the factor CR2 is the return from being overweight in corporate bonds in the Baa segment and underweight in the Aa segment, and CR3 is the return from being overweight in the Caa segment and underweight in the Baa segment. We also include a factor intended to represent liquidity risk. As mentioned in section 1.3, there are many different ways of representing liquidity risk. Here, we have chosen to use the TED spread as an indicator of liquidity risk (ILL). The TED spread is defined as the yield differential between the three-month interbank rate (LIBOR) and the three-month government bill rate, and is a measure of how hard or easy it is for banks to fund their activities. Brunnermaier and Pedersen (2008) show that the TED spread is related to liquidity risk in several different asset classes and in different markets. We have therefore used this factor for both the equity and fixed income portfolios.

In addition, we have included two factors with a non-linear return profile. The first (CRY) is intended to represent carry trades. This expression originates in fixed income management, but is often now used as an umbrella term for strategies that systematically collect risk premiums. These strategies are often compared with issuing insurance: there can be long periods of simply collecting premiums, but there can be a big loss if the sum insured has to be paid out. Within equity management, too, there are several examples of strategies that can be characterised as carry trades, such as arbitrage in takeover situations. In our analysis, we have used the return on a strategy that is systematically long on three high-yielding currencies and short on three low-yielding currencies as a proxy for carry trades. The other factor with a non-linear return profile (VOL) is the return on a strategy which has systematic exposure to implicit volatility, and therefore represents the return from being exposed to the volatility premium discussed in section 1.1.

The results indicate that the equity portfolio has been exposed to a number of priced risk factors, including the market (MKT), small companies (SML) and momentum stocks (UMD). The equity portfolio has also had significant negative exposure to the value factor (HML). This means that, on average, the equity portfolio has been biased towards growth stocks. Alpha, which is the estimated constant in the regression, is positive but not statistically significant. The other factor exposures are not statistically significant. Similarly, the fixed income portfolio has had exposure to illiquidity (ILL), credit risk (CR1) and volatility (VOL). Alpha is negative but not statistically significant.

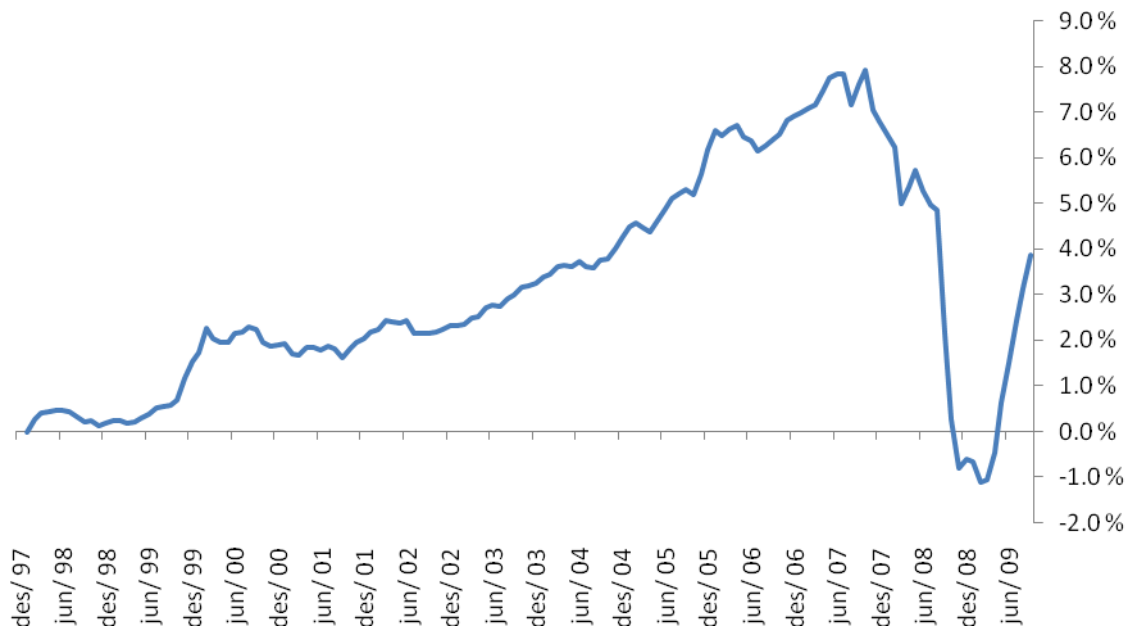
Estimation results. February 1998 to October 2009

	Equity portfolio		Fixed income portfolio	
	Coefficient	T-value ¹⁾	Coefficient	T-value ¹⁾
Alpha	0.0288	1.45	-0.0081	-0.44
MKT	0.0152	2.61	-0.0015	-0.04
VAL	-0.0373	-4.14		
SML	0.0367	3.93		
UMD	0.0067	2.02		
EMG	0.0073	1.03		
CR1			0.0588	2.80
CR2			-0.0025	-0.10
CR3			0.0003	0.11
ILL	0.0659	0.73	0.3997	4.82
CRY	-0.0032	-0.42	0.0150	1.66
VOL	0.0056	1.10	0.0173	2.19
Adj R ²	42.0%		62.2%	

1) Based on heteroskedasticity-consistent standard errors.

4.2 Returns over time

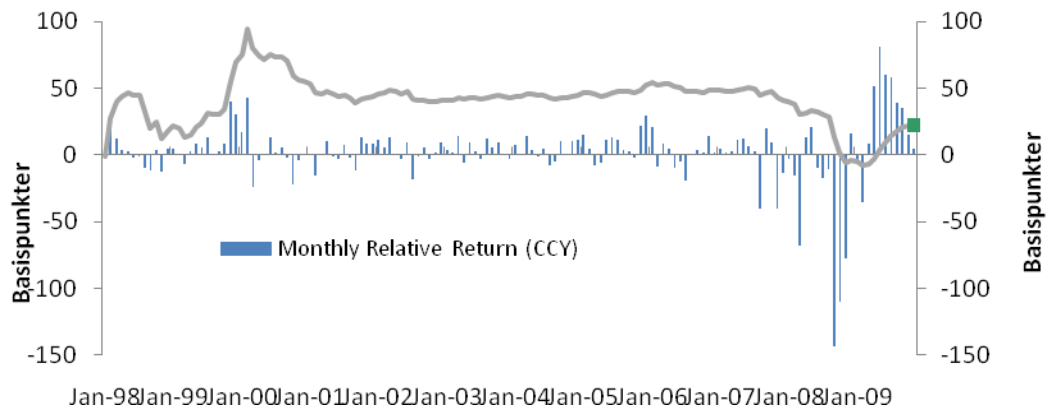
4.2.1 Accumulated excess return for the Government Pension Fund Global



1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0,18 %	1,54 %	1,91 %	2,05 %	2,31 %	3,23 %	4,23 %	6,19 %	6,90 %	6,80 %	-0,60 %	3,86 %

The chart shows the accumulated excess return for the Government Pension Fund Global in per cent expressed in the fund's currency basket from 31 December 1997 to 30 September 2009. The table shows the accumulated value at the end of each year.

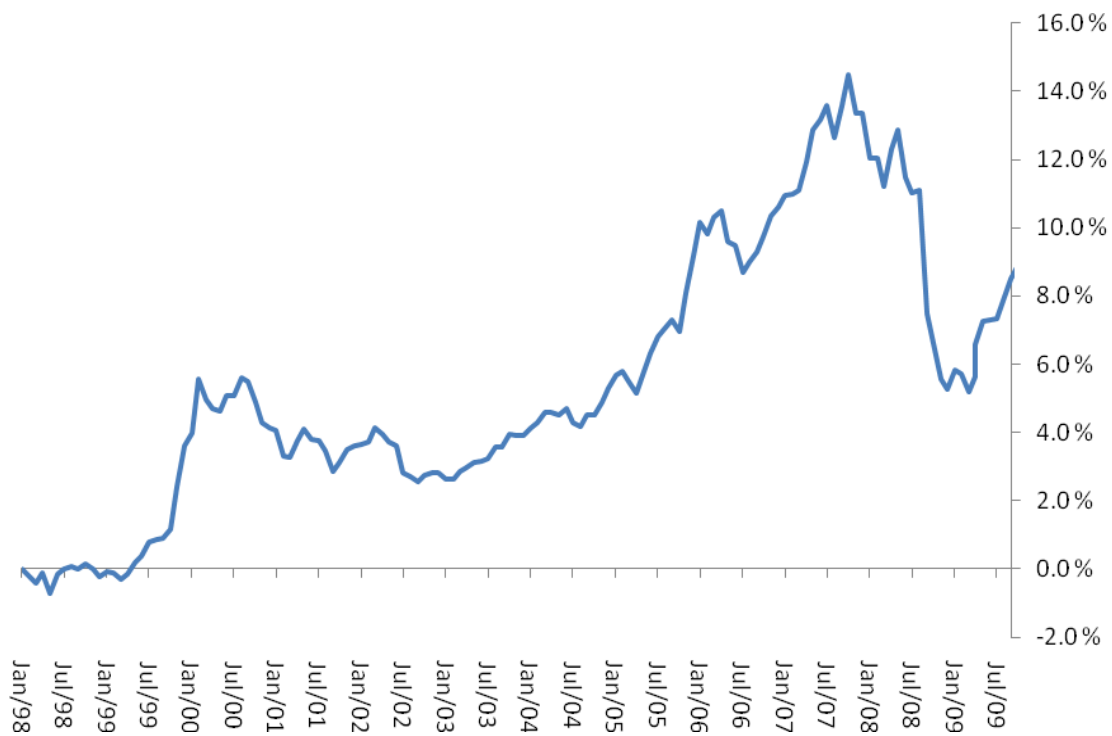
4.2.2 Annualised excess return for the Government Pension Fund Global



1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
22	75	54	46	41	44	47	55	48	40	-5	21

The chart shows the accumulated annualised excess return for the Government Pension Fund Global in basis points expressed in the fund's currency basket from 31 December 1997 to 30 September 2009. The table shows the annualised value at the end of each year.

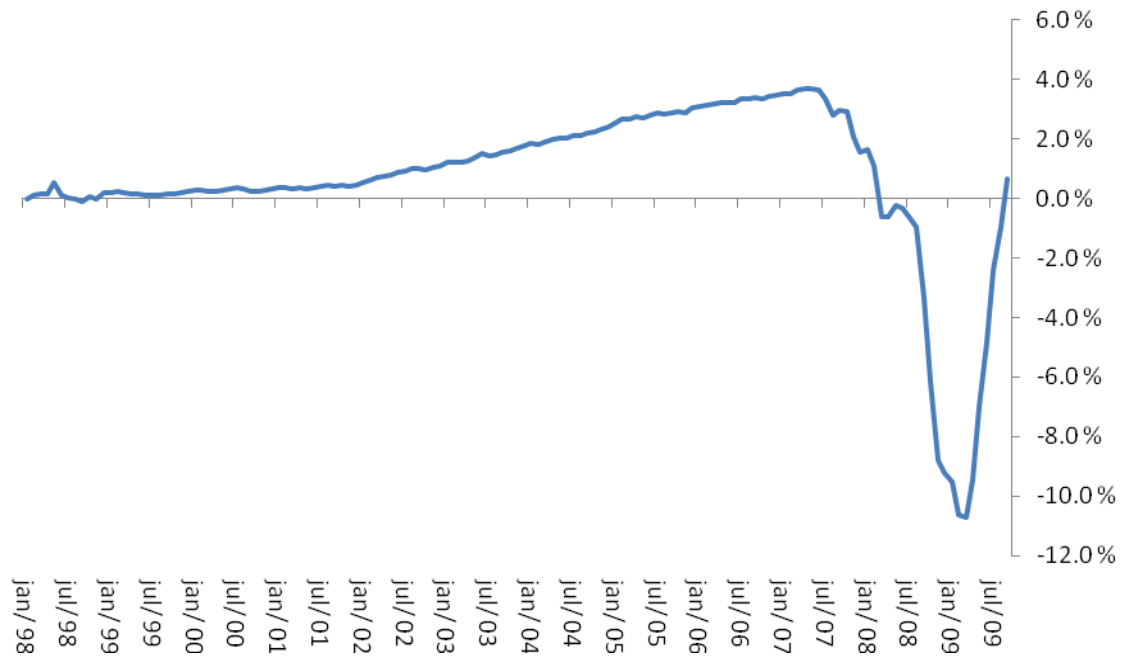
4.2.3 Accumulated excess return for the equity asset class



1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
-0,24 %	3,62 %	4,13 %	3,61 %	2,82 %	3,92 %	5,31 %	9,19 %	10,60 %	13,35 %	5,81 %	8,91 %

The chart shows the accumulated excess return for the Government Pension Fund Global's equity portfolio in per cent expressed in the fund's currency basket from 31 January 1998 to 30 September 2009. The table shows the accumulated value at the end of each year.

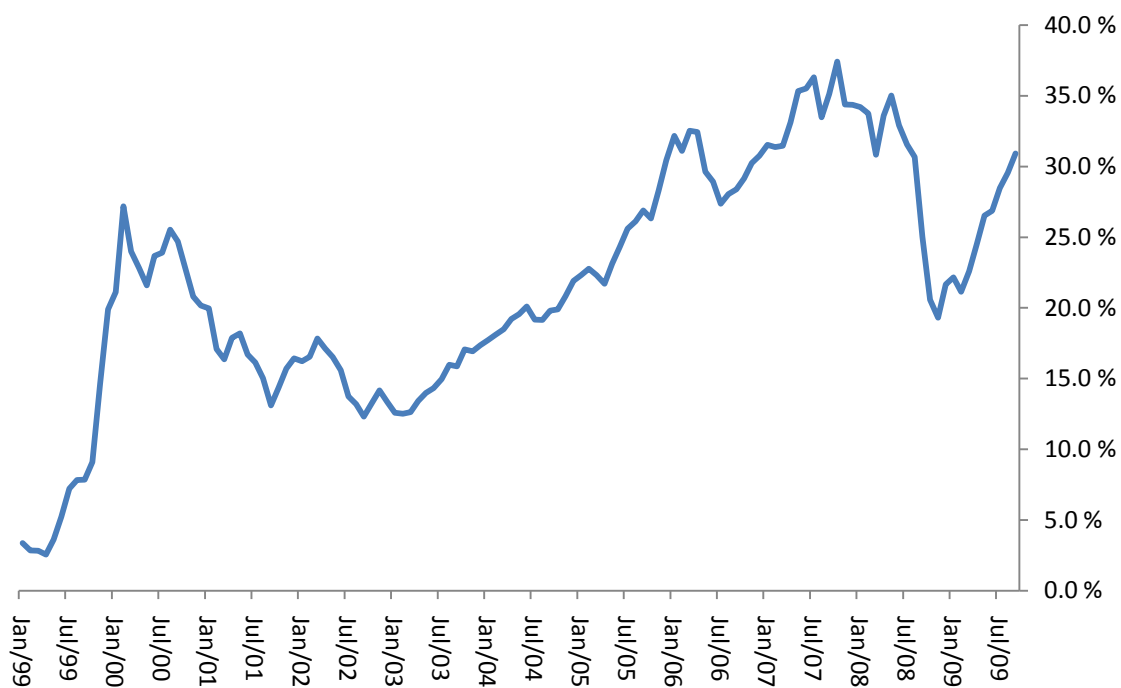
4.2.4 Accumulated excess return for the fixed income asset class



1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0,21 %	0,22 %	0,32 %	0,43 %	1,08 %	1,78 %	2,41 %	3,04 %	3,48 %	1,57 %	-9,22 %	0,67 %

The chart shows the accumulated excess return for the Government Pension Fund Global’s fixed income portfolio in per cent expressed in the fund’s currency basket from 31 December 1997 to 30 September 2009. The table shows the accumulated value at the end of each year.

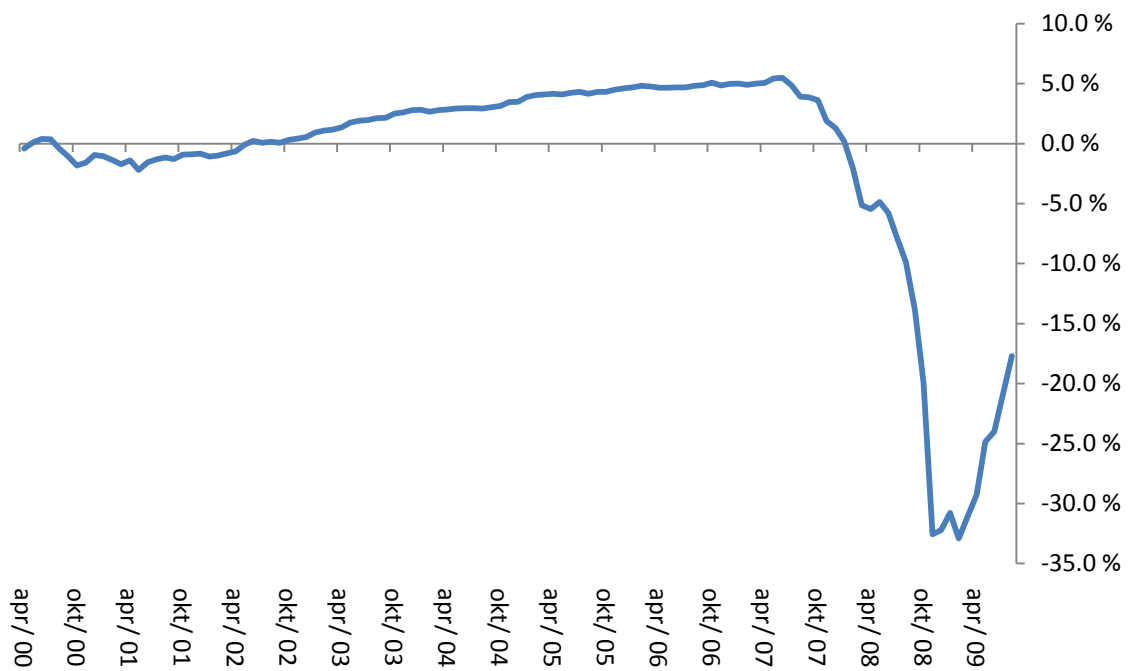
4.2.5 Accumulated excess return for external equity management



1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
19,91 %	20,18 %	16,43 %	13,35 %	17,36 %	21,91 %	30,43 %	30,77 %	34,36 %	21,65 %	30,92 %

The chart shows the accumulated excess return for the Government Pension Fund Global's externally managed equity portfolio in per cent expressed in the fund's currency basket from 31 December 1998 to 30 September 2009. The table shows the accumulated value at the end of each year.

4.2.6 Accumulated excess return for external fixed income management

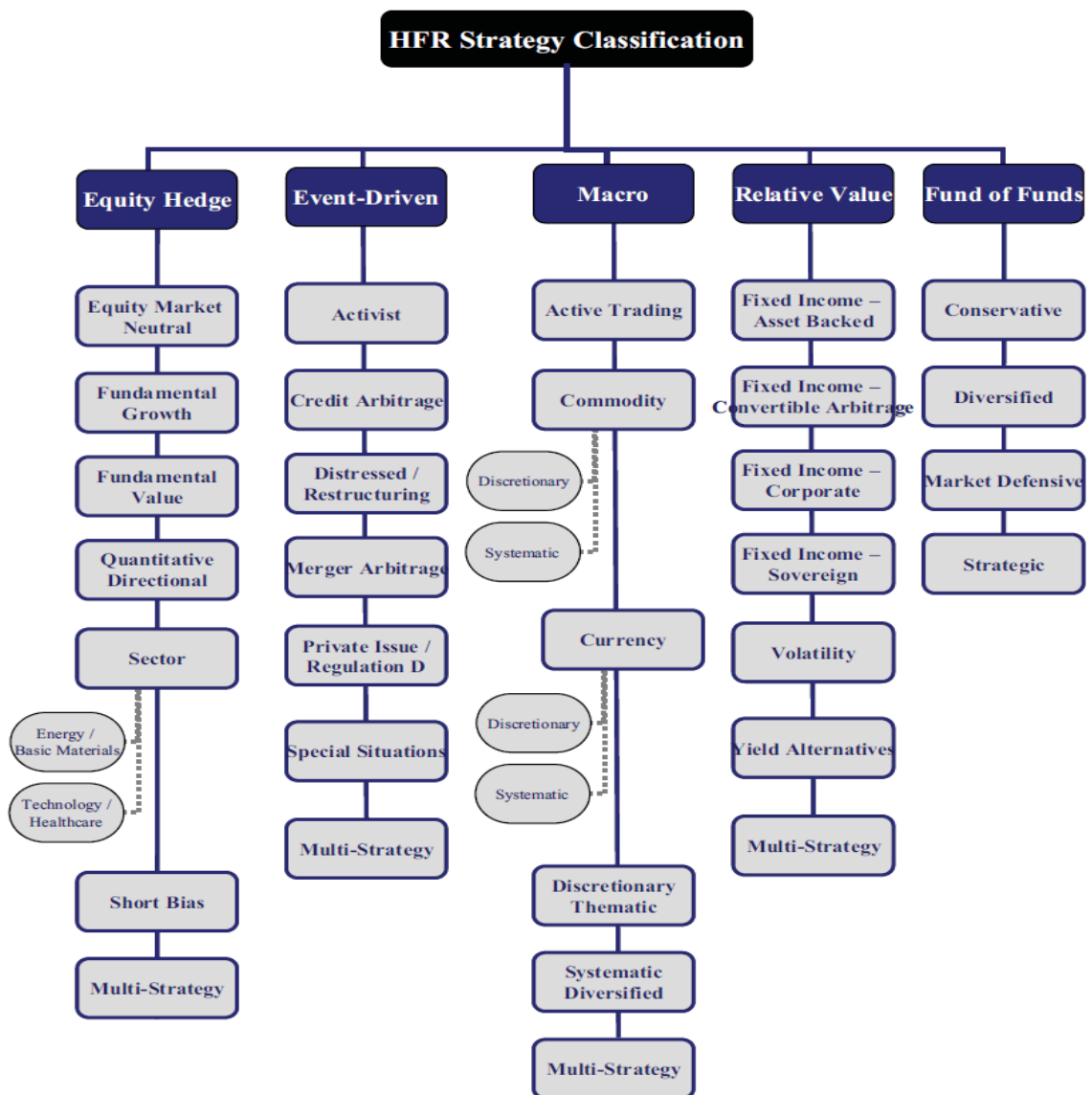


2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
-0,94 %	-0,84 %	0,56 %	2,79 %	3,49 %	4,59 %	4,99 %	1,30 %	-32,20 %	-17,69 %

The chart shows the accumulated excess return for the Government Pension Fund Global's externally managed fixed income portfolio in per cent expressed in the fund's currency basket from 31 March 2000 to 31 August 2009. The table shows the accumulated value at the end of each year.

4.3 Scope for active strategies

Norges Bank currently has three main strategies for active management: management of the market portfolio, management of company-specific strategies, and management of systematic risk. The figure below shows how Hedge Fund Research (HFR) defines the scope for active strategies and needs to be viewed as an illustration. The figure reveals that Norges Bank's active management currently covers only parts of the scope for active strategies. The investment strategy must be sufficiently flexible to adapt to new opportunities and new ways of approaching them.



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