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# Norwegian Government Pension Fund - Global Annual Performance Evaluation Report – 2009

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1

## The role of Mercer and BNY Mellon Asset Servicing

### 1.1 Background

- This report was commissioned by the Norwegian Ministry of Finance (“the Ministry”) and has been prepared by Mercer Limited (“Mercer”) in accordance with the terms of a contract awarded by the Ministry to Mercer. The terms of reference for this work are set out in the Invitation to Tender issued by the Ministry on 11 February 2008.

### 1.2 Role of Mercer

- The purpose as set out in the Public Procurement document is for Mercer to verify Norges Bank’s internal performance measurements and to strengthen the Ministry’s basis for evaluating the competence and actions of Norges Bank. Mercer outsources the role of performance verification to BNY Mellon Asset Servicing (“BNY MAS”), an independent performance measurer appointed by Mercer.

### 1.3 Role of BNY Mellon Asset Servicing

- The function of calculating and verifying Norges Bank’s internal performance measurement is carried out by BNY MAS under the guidance of Mercer who retains overall responsibility for the process. BNY MAS calculates performance for the Norwegian Government Pension Fund Global (“the Pension Fund”) based on portfolio data and market values supplied by the custodians, JP Morgan Chase and Citigroup (until October 2009). From October 2009, all portfolio data and market values are supplied by a single custodian, JPMorgan Chase.
- BNY MAS employs the “time weighted” rate of return as the base performance statistic. This return measure takes into account investment income, as well as realised and unrealised capital profits or losses. The use of this statistic minimises distortions due to cash flows into and out of a portfolio which are, in general, outside the control of the investment manager. Further details about BNY MAS’ calculation methodology are contained within Appendix A.
- The performance measurement methodology employed by BNY MAS is consistent with the one employed by Norges Bank in periods where all cash flows occur at month end. Between June 2007 and June 2009 the strategic equity allocation was gradually increased from 40 % to 60 %. During this transition period, both mid month and month end transfers/rebalancing between the Equity and Fixed Income Segments

were carried out. Norges Bank calculates an exact time weighted rate of return using market values on each of the actual transfer dates. The performance methodology employed by BNY MAS makes an assumption that all cash flows occur at month end. Therefore, any cash flows occurring mid month until June 2009 can lead to differences between the performance returns calculated by BNY MAS and Norges Bank in the range of 0.10% to 1.00%.

# 2

## Summary of control function

### 2.1 Scope of control function

- Mercer has, in conjunction with BNY MAS, performed control and verification functions throughout 2009, in accordance with the terms of the contract awarded by the Ministry.
- The objective of this process has been to check Norges Bank's internal performance measurements and to perform wider verification checks, both at portfolio and benchmark levels, according to instructions received from the Ministry.

### 2.2 Controls conducted in 2009

- During the course of 2009 Mercer has, in conjunction with BNY MAS, measured and verified the monthly returns of the Pension Fund, along with the respective benchmark returns, in both the currency basket measure and Norwegian Kroner terms.
- Throughout the report, performance in respect of the Equity and Fixed Income Segments of the Pension Fund for 2009 and longer periods has been sourced from BNY MAS (with the exception of the currency basket return and benchmark calculations prior to 31 December 2003).
- The monthly performance of the Pension Fund at the Total, Equity and Fixed Income levels has been reported to the Ministry by means of a report issued directly by BNY MAS.
- In the event of discrepancies in performance calculation between Norges Bank's internal performance measurement and BNY MAS's calculations, when measured to two decimal places (e.g. a 0.01% difference in absolute terms), further checks are made, the results of which are reported to the Ministry by means of a report accompanying the monthly report. Additionally, Norges Bank provides a summary explanation of the differences in market values and performance reporting between Norges Bank and BNY MAS on a monthly basis.
- A comprehensive summary of the data processing and reporting process that BNY MAS carries out as a result of its role in the Control Function is contained within Appendix B.

# 3

## Pension Fund details

### 3.1 Performance objective

- The Ministry has delegated the operational management of the Pension Fund to Norges Bank who manage the Pension Fund in accordance with a mandate stipulated by the Ministry in public regulations. The performance objective is to maximise returns given the restrictions imposed by the regulations and the desired risk profile. The risk tolerance for the Pension Fund is determined to be an ex-ante tracking error of 1.5% p.a. relative to the benchmark allocation.
- The Ministry specifies the benchmark portfolio, comprised of equity and fixed income instruments reflective of the Pension Fund's investment strategy.

### 3.2 Pension Fund benchmark

- The strategic benchmark for the Pension Fund is set by the Ministry of Finance. Over time, divergent price movements will affect the size of the Fund's holdings in each asset class. A rebalancing plan, as set by the Ministry, is therefore applied to realign the Pension Fund's holdings in each asset class with the strategic benchmark.
- In 2007 the Ministry decided, with the Storting's approval, to amend the strategic benchmark from 60% fixed income/ 40% equities to 40% fixed income / 60% equities. To achieve this objective, Norges Bank carried out both mid month and month end transfers/rebalancing between the Equity and Fixed Income Segments of the Pension Fund. The progression to the new benchmark was a gradual process conducted throughout 2007 and 2008 and was completed in June 2009.
- A new fixed income benchmark was introduced in 2002, which is constructed from the Lehman Global Aggregate family of indices (Barclays Capital Global Aggregate indices from 20 September 2008). In 2006, the strategic weights within the customised fixed income benchmark were changed from 55% Europe, 35% Americas and 10% Asia/Oceania to 60% Europe, 35% Americas and 5% Asia / Oceania.
- The equity benchmark uses FTSE equity indices for companies in forty-six countries. This has increased due to the addition of emerging markets to the portfolio. In 2006, the strategic weights within the customised equity benchmark was changed from 50% Europe and 50%

Americas/Asia/Oceania/Africa to 50% Europe, 35% Americas and Africa and 15% Asia / Oceania.

- In the fourth quarter of 2007, the composition of the equity benchmark portfolio was extended to include small capitalisation companies.
- In the third quarter of 2008, the composition of the equity benchmark was extended further to include companies from emerging market countries.
- The reader should note that one-off transaction costs are incurred when new transfers are made into the Pension Fund. Such costs are not deducted when the index supplier calculates the return on the benchmark. For the purpose of this report the benchmark return has not been adjusted for such costs, despite the presence of transaction costs detracting from the Pension Fund's returns. In addition to the transaction costs outlined above, the Pension Fund pays tax on share dividends in a number of countries. Since 2004 the equity benchmark is adjusted for tax on share dividends.
- Further detailed information on benchmarks is contained within Appendix B.

# 4

## Fund performance

This section of the report analyses the Pension Fund's and corresponding benchmark's monthly performance over the twelve month period to 31 December 2009, along with longer term analysis. Numerical performance shown in the charts and performance commentary is illustrated to two decimal places.

For the purpose of this report all Pension Fund and benchmark returns contained within sections 4.1 and 4.3 of this report are expressed in terms of the basket of currencies contained within the benchmark. The currency basket measure is relevant when assessing the Pension Fund's performance against the stated objective of maximising the Pension Fund's international purchasing power. Section 4.2 shows performance expressed in Norwegian Kroner.

Sections 4.1 and 4.2 consider the Pension Fund's performance along with the monthly performance for the Equity and Fixed Income Segments of the Pension Fund over the twelve month period to 31 December 2009. Section 4.3 considers longer term performance for the Pension Fund.

The process of moving to the 40% fixed income / 60% equity strategic benchmark as set by the Ministry, which commenced in 2007, was completed in June 2009. To achieve this objective, Norges Bank carried out both mid month and month end transfers/rebalancing between the Equity and Fixed Income Segments of the Pension Fund.

The performance methodology employed by BNY MAS makes an assumption that all cash flows (arising from transfers/rebalancing between the Fixed Income and Equity Segments of the Pension Fund and the transfer of newly generated capital into the Pension Fund) occur at month end. Until June 2009, the performance methodology employed by Norges Bank did not make this assumption. Therefore, any cash flows occurring mid month until June 2009 can lead to differences between the performance returns calculated by BNY MAS and Norges Bank in the range of 0.10% to 1.00%. Since July 2009, all cash flows have been assumed to take place at month end by both Norges Bank and BNY MAS.

Norges Bank and BNY MAS both independently calculate performance returns in NOK initially and then convert them to 'currency basket terms' using currency weights at the beginning of each period and the returns of each currency relative to NOK over that period. When all cash flows occur at month end (which is the normal case except for the transition period between June 2007 and June 2009), these periods correspond to calendar months.

The return in 'currency basket terms' provides the return to the Pension Fund as if the Pension Fund were a local investor for each asset held, effectively stripping out the

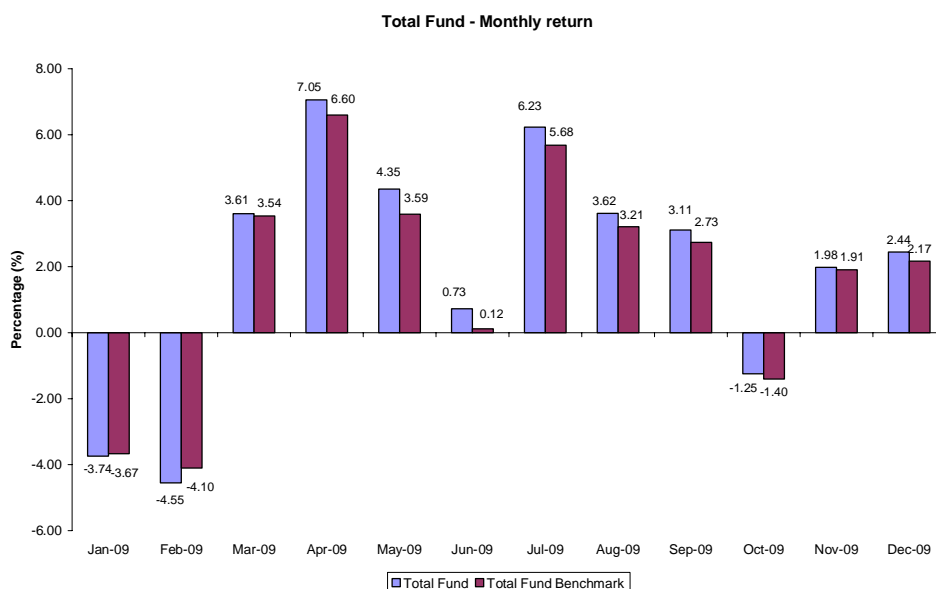


impact of foreign currency fluctuations on NOK returns. The currency returns for the Equity and Fixed Income Segments and the Total Fund are calculated based on the relative weights of each asset and the return for each asset. To change these returns to 'currency basket terms', the component of the return that is due to fluctuations between NOK and the currency basket is removed.

Discrepancies between the currency basket returns reported by BNY MAS and Norges Bank may occur due to the following reasons; BNY MAS assumes that rebalancing of the currency basket occurs at each month end, whereas until 30 June 2009 and as outlined above, Norges Bank rebalanced the Pension Fund from 60% fixed income/ 40% equities to 40% fixed income / 60% equities at both mid-month and month end. The returns used for each currency may differ and the relative currency weights (for the Equity and Fixed Income Segments) and the asset weights (for the Total Fund) may differ. These differences may cause discrepancies of usually no more than 0.01% to two decimal places.

#### 4.1 Pension Fund returns (currency basket)

##### 4.1.1 Pension Fund – Total returns (currency basket)



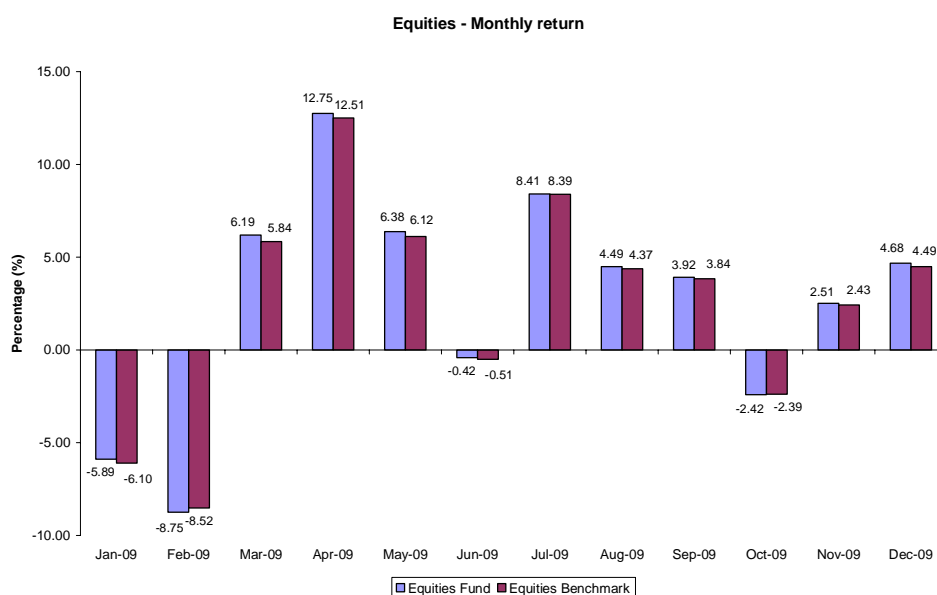
Data source: Returns calculated by BNY Mellon Asset Servicing (c) Copyright 2010 BNY Mellon Asset Servicing.

- Over the twelve month period to 31 December 2009, the Pension Fund produced a cumulative return of 25.44%, 3.80% above the benchmark return of 21.64%. Norges Bank have calculated the twelve month Pension Fund return to be 25.62%. The 0.18% difference between the cumulative twelve month return calculated by BNY MAS and that calculated by Norges Bank can mainly be attributed to differences in transfers reported by the custodians of the Fixed Income segment of the Fund, in particular, the transfer of bonds from JPMorgan Chase to Citigroup as part of the standard asset management procedures of the Fund in April and July leading to discrepancies of NOK 948.9m and NOK 633.6m respectively. The discrepancies arose from differences in the processes and accounting conventions used by JP Morgan Chase and Citigroup in applying

exchange rates to value the bonds. JPMorgan Chase reported these transfers using historic exchange rates to value the bonds, while Citigroup used current exchange rates.

- The difference between the cumulative twelve month returns calculated by BNY MAS and Norges Bank can also be attributed to write downs in January and February arising from the omittance of financing charges on Contracts for Differences (“CFDs”) by the custodians. State Street Bank, operating as a back office for JP Morgan’s equity related assets, had omitted financing charges from their reporting on CFDs in the period February to March, and November to December during 2007 in addition to all of 2008. A manual adjustment was made by Norges Bank to account for the omittance of these financing charges. This adjustment was not made by BNY MAS. In addition, differences in the adjustments to the settlements amounts due from the bankruptcy of Lehmans as recorded by Norges Bank and the custodians contributed to return discrepancies. Please refer to Section 6 of this report for further explanation of the returns deviations between BNY MAS and Norges Bank experienced during January, February, April, May and July.
- Over the twelve month period to 31 December 2009, BNY MAS reported a twelve month benchmark return of 21.64% whereas Norges Bank has reported 21.52%. The vast majority of this difference in benchmark returns is due to the fact that BNY MAS is lagging behind the actual bi-monthly adjustments of the equities allocation in the total benchmark. Any remaining residual is as a result of the restating of benchmark returns or rounding effects in the calculations.
- Total Fund performance outperformed the benchmark in all months apart from January and February where the fund underperformed by 0.07% and 0.45% respectively. The months where outperformance was greatest were May and June where the Pension Fund outperformed the benchmark returns of 3.59% and 0.12% by 0.76% and 0.61% respectively.

#### 4.1.2 Pension Fund - Equity returns (currency basket)

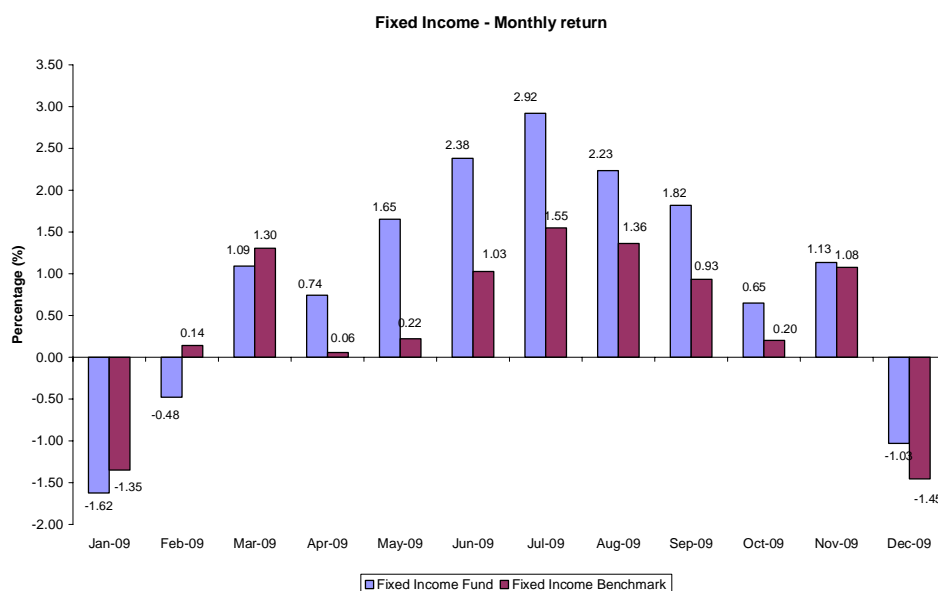


Data source: Returns calculated by BNY Mellon Asset Servicing (c) Copyright 2010 BNY Mellon Asset Servicing.

- Over the twelve month period to 31 December 2009, the Equity Segment of the Pension Fund produced a cumulative return of 34.27%, 1.73% above the benchmark return of 32.54%. Norges Bank have also calculated a twelve month Pension Fund return for the Equity Segment to be 34.27%. On a month by month basis, any differences between calculated performance return can mainly be attributed to the timing of significant cashflows and the difference between how Norges Bank and BNY MAS allowed for these cashflows within their respective performance calculations. As previously noted, cashflows may arise from the transfer of newly generated capital injected into the Pension Fund or alternatively, transfers between the Equity and Fixed Income Segments of the Fund as part of the rebalancing between asset classes to align with the strategic benchmark of the Pension Fund as set by the Ministry. Please refer to Section 6 of this report for an explanation of the returns deviations between BNY MAS and Norges Bank experienced during January, February, March, April and May.
- Over the twelve month period to 31 December 2009, BNY MAS reported a twelve month benchmark return of 32.54% whereas Norges Bank has reported 32.46%. This difference is mainly attributed to significant cashflows occurring during the year, most notably, a NOK 23.79bn inflow which occurred mid month during February. The performance methodology employed by BNY MAS makes an assumption that all cash flows occur at month end. Until June 2009, the performance methodology employed by Norges Bank did not make this assumption. Therefore, any cash flows occurring mid month until June 2009 can lead to differences between the performance returns calculated by BNY MAS and Norges Bank.

- On a month-by-month basis, the performance of the Pension Fund's Equity Segment outperformed the benchmark in all months, with the exception of February and October, where performance was below the benchmark by 0.23% and 0.03% respectively. Outperformance was greatest during the months of March, April and May where the Equity Segment outperformed the benchmarks of 5.84%, 12.51% and 6.12% by 0.35%, 0.24% and 0.26% respectively.

#### 4.1.3 Pension Fund - Fixed income returns (currency basket)



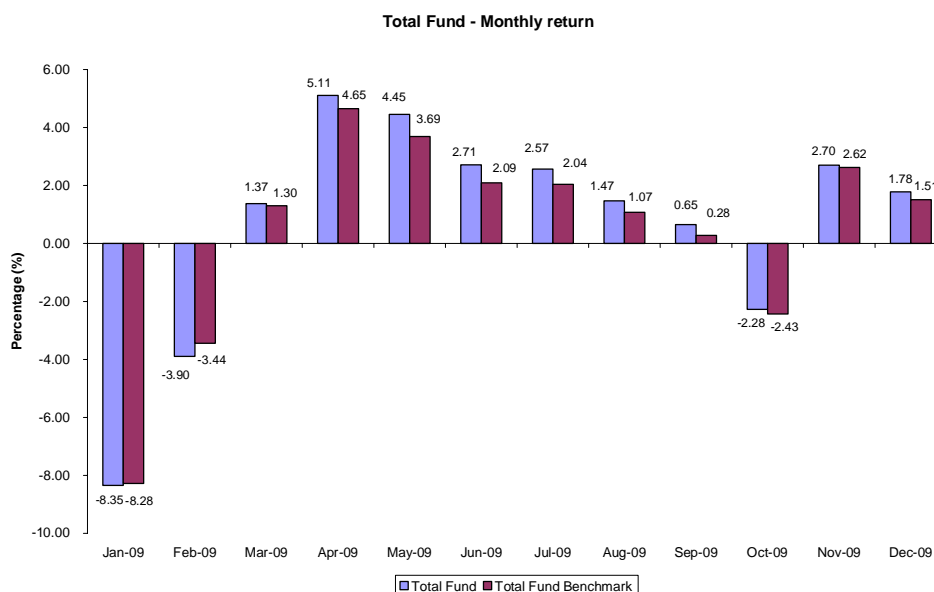
Data source: Returns calculated by BNY Mellon Asset Servicing (c) Copyright 2010 BNY Mellon Asset Servicing.

- Over the twelve month period to 31 December 2009, the Fixed Income Segment of the Pension Fund produced a cumulative return of 12.00%, 6.86% above the benchmark return of 5.14%. Norges Bank have calculated the twelve month Pension Fund return for the Fixed Income Segment to be 12.49%. The 0.49% difference between the cumulative twelve month return calculated by BNY MAS and that calculated by Norges Bank is mainly attributed to differences in transfers reported by the custodians of the Fixed Income Segment of the Pension Fund, in particular, the transfer of bonds as part of the standard asset management procedures of the Fund in April and July. The discrepancies arose from differences in the processes and accounting conventions used by JP Morgan Chase and Citigroup in applying exchange rates to value the bonds. JPMorgan Chase reported these transfers using historic exchange rates to value the bonds, while Citigroup used current exchange rates. Please refer to Section 6 of this report for a more detailed explanation of the return deviations between BNY MAS and Norges Bank experienced during January, February, March, April, May, July, and August.
- Over the twelve month period to 31 December 2009, BNY MAS reported a benchmark return of 5.14% whereas Norges Bank has reported a benchmark return of 5.13%. This 0.01% difference is within the tolerance stated in Section 2.

- On a month-by-month basis, the Pension Fund's Fixed Income Segment exceeded the benchmark in nine of the twelve month periods but underperformed in each of the first three periods. The greatest outperformance occurred in May, June and July where the Fixed Income Segment outperformed the benchmark return of 0.22%, 1.03% and 1.55% by 1.43%, 1.35% and 1.37%. Underperformance was greatest in February where the Fixed Income Segment underperformed the benchmark return of 0.14% by 0.62%.

## 4.2 Pension Fund returns (Norwegian Kroner)

### 4.2.1 Pension Fund - Total returns (Norwegian Kroner)



Data source: Returns calculated by BNY Mellon Asset Servicing (c) Copyright 2010 BNY Mellon Asset Servicing.

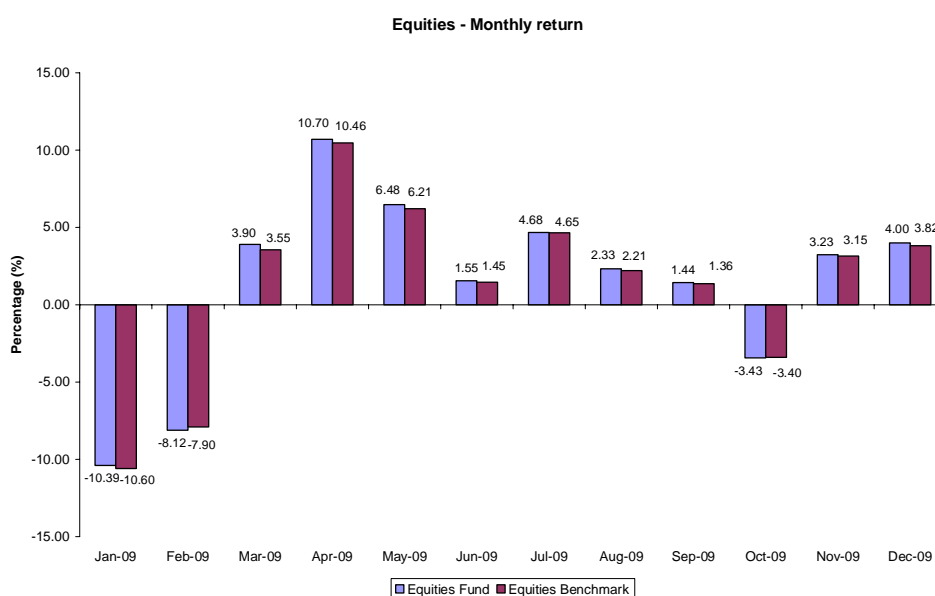
- Over the twelve month period to 31 December 2009, the Pension Fund produced a cumulative return of 7.75%, outperforming the benchmark return of 4.47% by 3.28%. Norges Bank have calculated a twelve month Pension Fund return of 7.88%. The 0.14%<sup>1</sup> difference between the cumulative twelve month return calculated by BNY MAS and that calculated by Norges Bank is mainly attributed to differences in transfers reported by the custodians of the Fixed Income Segment of the Pension Fund. In particular, the transfer of bonds as part of the standard asset management procedures of the Fund in April and July. The discrepancies arose from differences in the processes and accounting conventions used by JP Morgan Chase and Citigroup in applying exchange rates to value the bonds. JPMorgan Chase reported these transfers using historic exchange rates to value the bonds, while Citigroup used current exchange rates.
- The difference between the cumulative twelve month return calculated by BNY MAS and Norges Bank can also be attributed to the timing of significant cashflows, which occurred during February, March, April,

<sup>1</sup> Figures do not sum due to rounding

and June primarily as a result of the rebalancing of the Fund from 60% fixed income/ 40% equities to 40% fixed income / 60% equities and the difference between how Norges Bank and BNY MAS allowed for these cashflows within their respective performance calculations. Please refer to Section 6 of this report for an explanation of the return deviations experienced between BNY MAS and Norges Bank during March, April, May and July.

- Over the twelve month period to 31 December 2009, BNY MAS reported a benchmark return of 4.47% whereas Norges Bank has reported 4.36%. The vast majority of the 0.11% difference in benchmark returns is due to the fact that BNY MAS is lagging behind the actual bi-monthly adjustments of the equities allocation in the total benchmark. Any remaining residual is as a result of the restating of benchmark returns or rounding effects in the calculations.
- Total Fund performance outperformed the benchmark in all months with the exception of January and February where performance was below the benchmark returns of -8.28% and -3.44% by 0.07%, 0.45%<sup>1</sup> respectively. Outperformance was greatest in May, June and July where performance was above the benchmark returns of 3.69%, 2.09% and 2.04% by 0.76%, 0.62% and 0.53% respectively.

#### 4.2.2 Pension Fund - Equity returns (Norwegian Kroner)



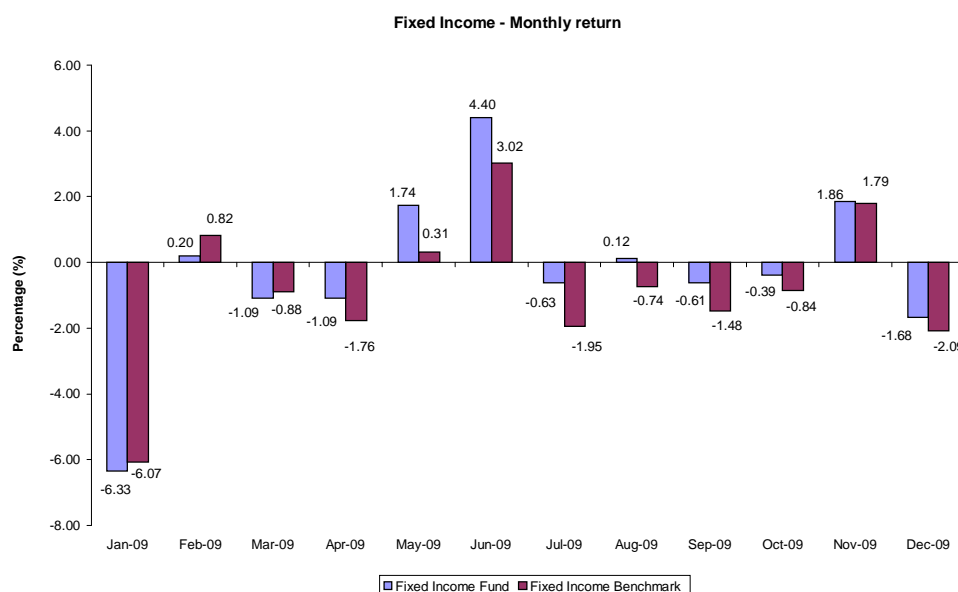
Data source: Returns calculated by BNY Mellon Asset Servicing (c) Copyright 2010 BNY Mellon Asset Servicing.

- Over the twelve month period to 31 December 2009, the Equity Segment of the Pension Fund produced a cumulative return of 15.33%, outperforming the benchmark return of 13.83% by 1.50%. Norges Bank have calculated the twelve month return for the Equity Segment of the Pension Fund to be 15.31%. The 0.02% difference between the cumulative twelve month return calculated by BNY MAS and that calculated by Norges Bank is mainly attributable to the timing of significant cashflows, which occurred during February, March, April and June primarily as a result of the rebalancing of the Pension Fund

from 60% fixed income/ 40% equities to 40% fixed income / 60% equities and the difference between how Norges Bank and BNY MAS allowed for these cashflows within their respective performance calculations. Please refer to Section 6 of this report for an explanation of the return deviations between BNY MAS and Norges Bank experienced during February, and March.

- Over the twelve month period to 31 December 2009, BNY MAS reported a twelve month benchmark return of 13.83% whereas Norges Bank has reported 13.80%. This 0.03% difference is mainly attributed to the timing of rebalancing within the benchmark and the differences between how Norges Bank and BNY MAS allowed for this rebalancing within their respective calculations.
- On a month-by-month basis, the performance of the Equity Segment of the Pension Fund exceeded the benchmark in all but two of the twelve months, February and October with returns below the benchmark by 0.22% and 0.03% respectively. The greatest outperformance occurred during the months of March and May where the Equity Segment outperformed the benchmark returns of 3.55% and 6.21% by 0.35% and 0.27% respectively. Other months of notable performance occurred in January and August where performance was above the benchmark by 0.21% and 0.12% respectively.

#### 4.2.3 Pension Fund - Fixed income returns (Norwegian Kroner)



Data source: Returns calculated by BNY Mellon Asset Servicing (c) Copyright 2010 BNY Mellon Asset Servicing.

- Over the twelve month period to 31 December 2009, the Fixed Income Segment of the Pension Fund produced a cumulative return of -3.79%, outperforming the benchmark return of -9.70% by 5.91%. Norges Bank have calculated the Fixed Income return as -3.39%, a

difference of 0.39%<sup>1</sup>. The difference between the cumulative twelve month return calculated by BNY MAS and that calculated by Norges Bank is mainly attributed to differences in transfers reported by the custodians of the Fixed Income Segment of the Pension Fund, in particular, the transfer of bonds as part of the standard asset management procedures of the Fund in April and July. The discrepancies arose from differences in the processes and accounting conventions used by JP Morgan Chase and Citigroup in applying exchange rates to value the bonds. JPMorgan Chase reported these transfers using historic exchange rates to value the bonds, while Citigroup used current exchange rates. Please refer to Section 6 of this report for an explanation of the return deviations experienced during January, February, March, April, May, July, August and October.

- BNY MAS reported a benchmark return of -9.70% whereas Norges Bank has reported -9.71%. This 0.02% difference (after rounding) is mainly attributed to timing of rebalancing within the benchmark and the differences between how Norges Bank and BNY MAS allowed for this rebalancing within their respective calculations.
- On a month-by-month basis, the Pension Fund's Fixed Income Segment outperformed the benchmark in nine of the twelve month periods but underperformed in each of the first three months. Underperformance was most significant in the month of February where the fund underperformed the benchmark return of 0.82% by 0.62%. This difference is mainly attributed to significant cashflows occurring during the year, most notably, a NOK 23.79bn inflow which occurred mid month during February. The performance methodology employed by BNY MAS makes an assumption that all cash flows occur at month end. Until June 2009, the performance methodology employed by Norges Bank did not make this assumption. Therefore, any cash flows occurring mid month until June 2009 can lead to differences between the performance returns calculated by BNY MAS and Norges Bank.
- This difference between the benchmark return calculated by BNY MAS and that calculated by Norges Bank is mainly attributed to significant cashflows occurring during the month of February and the differences between how Norges Bank and BNY MAS allowed for this rebalancing within their respective calculations.
- Outperformance peaked during the months of May, June and July where the Fixed Income Segment outperformed the benchmark of 0.31%, 3.02% and -1.95% by 1.43%, 1.38% and 1.32% respectively.

#### 4.3 Pension Fund (currency basket) Longer term performance

The following charts show quarterly performance relative to benchmark for the twelve year period ending 31 December 2009 for the Pension Fund and the Fixed Income Segment, and the eleven and three quarter year period ending 31

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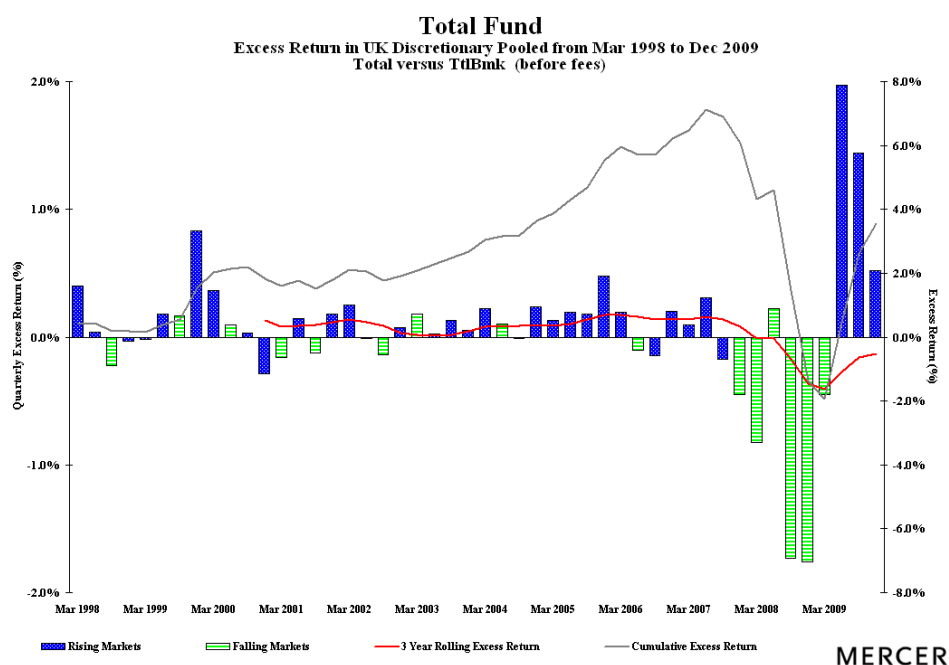
<sup>1</sup> Figures do not sum due to rounding.



December 2009 for the Equity Segment. In addition, the charts illustrate the three-year rolling and cumulative excess returns over the period ending 31 December 2009. As the charts evaluate relative performance, they can be used as a measure to assess the manager's ability to add value in excess of benchmark over a period of time.

- The charts are generated using Mercer Manager Performance Analytics (MPA) and use local returns from the currency basket measure. This is done to ensure that the rising/falling market indicator is not influenced by changes in the value of Norwegian Kroner.
- Performance since 1 January 2004 has been sourced from BNY Mellon. Prior performance has been sourced from Norges Bank.

#### 4.3.1 Pension Fund – Total returns (currency basket)



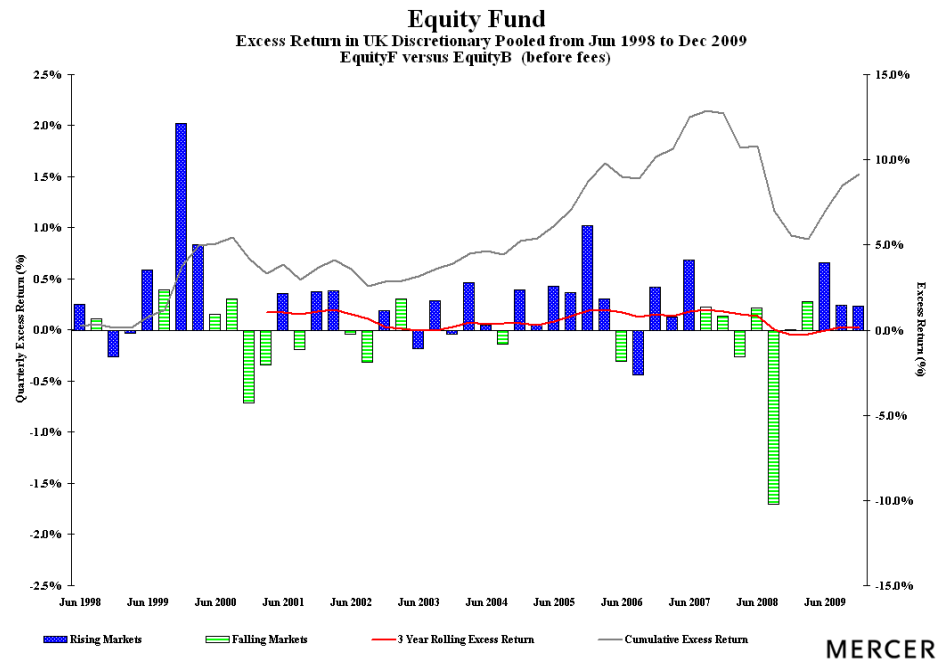
Source: Mercer MPA, Norges Bank and (c) Copyright 2010 BNY Mellon Asset Servicing.

- The Pension Fund has outperformed its benchmark on a quarterly basis in thirty one of the forty eight quarters under review.
- Long term relative performance became negative in 2008, primarily as a result of the significant decrease in the latter half of the year. The performance of the fund recovered sharply during 2009 following the improvement and stabilisation of global financial markets. Rolling three-year annualised excess performance was -0.5% p.a. as at 31 December 2009 after first becoming negative in September 2008. Norges Bank have reported a three year annual excess return of -0.4%. The cumulative excess return became negative for the first time in December 2008. The cumulative excess return over the twelve years ending 31 December 2009 stood at 3.6%; the annualised cumulative excess return over the period was 0.2% p.a. Norges Bank

calculated the annualised cumulative excess return over twelve years ending 31 December 2009 to be 0.3% p.a.

- It is notable that during periods of rising markets, the portfolio has had a tendency to outperform and that in falling markets, the portfolio has a tendency to underperform. This is based on observations and not statistical analysis.

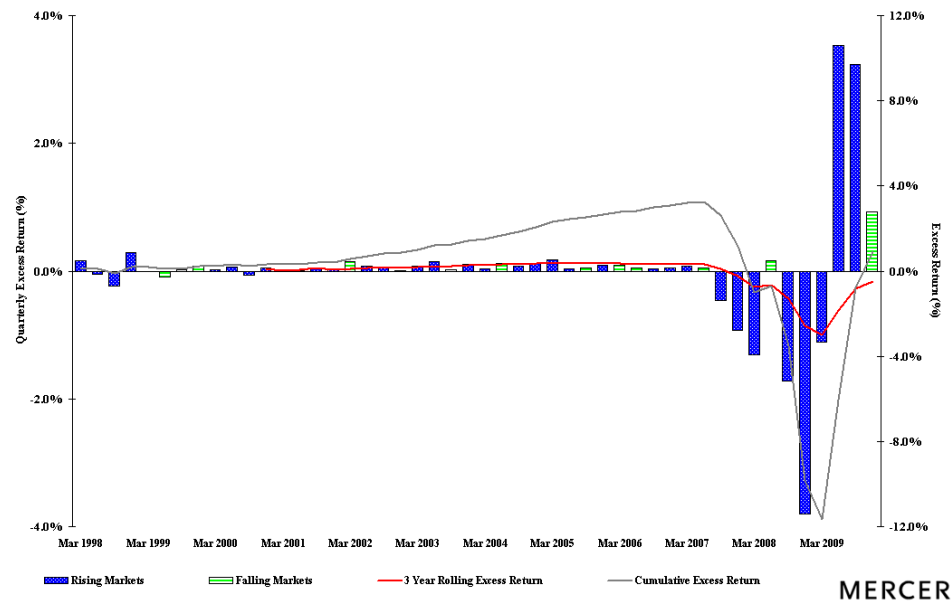
#### 4.3.2 Pension Fund - Equity returns (currency basket)



Source: Mercer MPA, Norges Bank and (c) Copyright 2010 BNY Mellon Asset Servicing.

- The Equity Segment has outperformed its benchmark in thirty three out of the forty seven quarters, underperforming in the remainder.
- Rolling three-year excess performance was strong in the periods to 2001 and the first part of 2002. Performance dipped to a low point in mid 2003 before recovering in later quarters. Rolling three-year annualised excess performance became negative during 2008, primarily as a result of underperformance in September 2008. Performance has returned to positive levels as a result of the strong performance across all quarters of 2009 with rolling three-year annualised excess performance returning a value of 0.1% p.a. as at 31 December 2009. Norges Bank's calculated the rolling three year annualised excess performance to be 0.2% p.a.
- The cumulative excess return for the period since inception, 1 February 1998, to 31 December 2009 is positive at 9.2%. The annualised cumulative excess return over the period was 0.6% p.a. in agreement with Norges Bank's calculations.
- During periods of rising markets, the portfolio has had a tendency to outperform. This is based on observations and not on statistical analysis.

### 4.3.3 Pension Fund - Fixed income returns (currency basket)



Source: Mercer MPA, Norges Bank and (c) Copyright 2010 BNY Mellon Asset Servicing.

- With the exception of the first three years, where performance was mixed, the Fixed Income Segment of the Pension Fund has consistently outperformed its benchmark over the nine and a half year period to 30 June 2007. For the second half of 2007 and over the first quarter of 2008, the fixed Income segment underperformed its benchmark. The fund then had marginal outperformance in the quarter to June 2008 with significant underperformance in the following three quarters. With the exception of the first quarter of 2009, the Fixed Income Segment has experienced significant outperformance over the last three quarters of 2009, the greatest outperformance experienced by the fund over the second and third quarters of 2009 with returns above benchmark by 3.5% and 3.2% respectively.
- Rolling three-year excess returns have been consistently positive up to 30 June 2007, however, as a result of underperformance during the second half of 2007 and throughout 2008, rolling three-year annualised excess returns fell into negative territory reaching a low point of -3.0% in March 2009. Since then, rolling three-year excess returns have improved significantly reaching a value of -0.5% p.a. as at 31 December 2009. Norges Bank calculated the rolling three-year annualised excess returns to be -0.3% p.a.
- The cumulative excess return has returned to positive levels, with a value of 0.9% over the twelve year period to 31 December 2009. Cumulative performance rose steadily over the nine and a half year period to 30 June 2007, but fell back sharply following the significant underperformance in 2008. Cumulative excess returns have now returned to positive levels for the first time since March 2008. The

annualised cumulative excess return over the period since inception was 0.0% p.a. Norges Bank calculated the annualised cumulative excess return over this period to be 0.1% p.a.

## 5

## Style research portfolio analysis

### 5.1 Introduction

- This section takes a closer look at the style characteristics of the Equity Segment of the Pension Fund over the four quarters to 31 December 2009.
- When analysing the Equity Segment's style characteristics we have used an analytical software package called Style Research Portfolio Analysis ("SRPA") provided by Style Research Limited. SRPA looks at the individual securities held within a portfolio at any one point in time (a "snap-shot") and uses a "bottom-up" approach to analyse the style adopted and risk taken by the investment manager. The snap-shot analysis is based on a detailed, multi-dimensional examination of the Equity Segment's composition at a point in time – it is not based on historical returns.
- The SRPA risk attribution model is different from the risk model used by Norges Bank. Norges Bank uses a risk model called RiskManager (developed by Riskmetrics) to measure expected tracking error.
- The charts shown in Section 5.2 highlight specific style characteristics of the Equity Segment as at 31 March 2009, 30 June 2009, 30 September 2009 and 31 December 2009. In addition, the style characteristics as at 31 December 2007 and 31 December 2008 are also shown to highlight changes over the last three years. The set of charts shown in Section 5.2 emphasise the key style features of the Equity Segment in terms of any "value" tilts (represented by the first group of blue bars) and "growth" tilts (represented by the second group of green bars). The analysis is conducted relative to the customised benchmark of the Equity Segment of the Pension Fund. When interpreting SRPA outputs, tilts (represented as Standard Deviations away from the benchmark mean) greater than  $\pm 1$  but less than  $\pm 2$  are regarded as statistically significant. Tilts great than  $\pm 2$  are regarded as statistically very significant.
- The second set of charts, shown in Section 5.3, plot the breakdown of the portfolio in terms of industry sector weightings and is again compared with the customised benchmark.

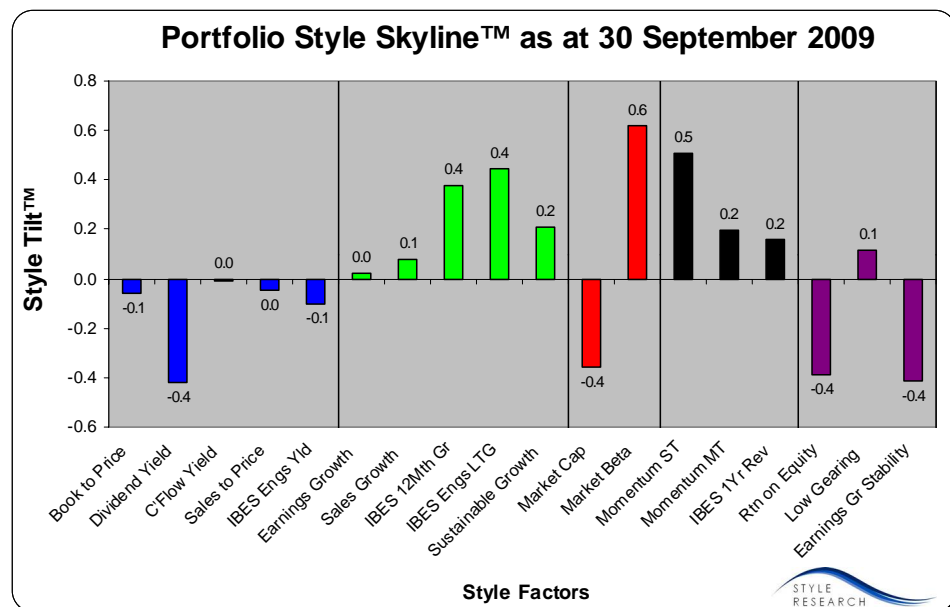
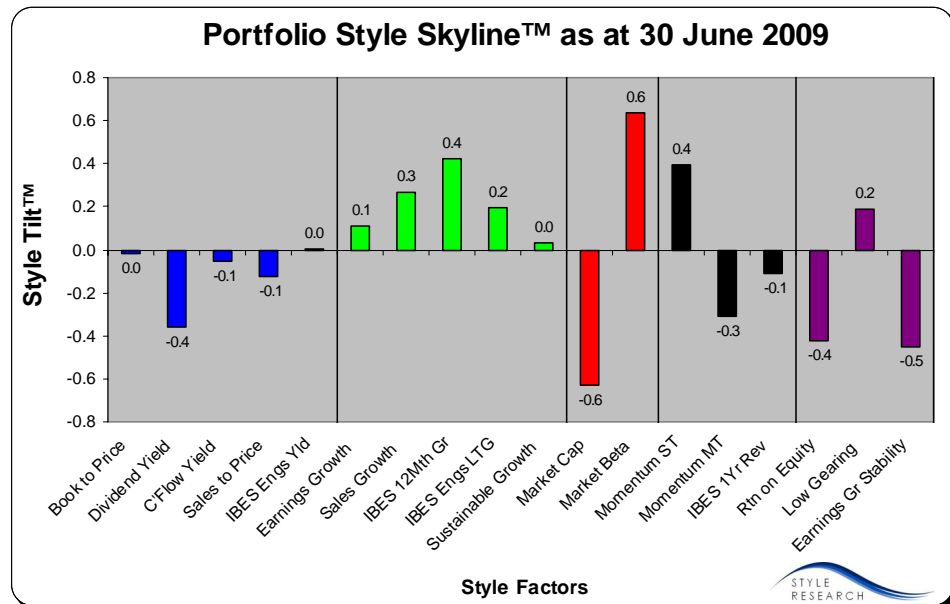
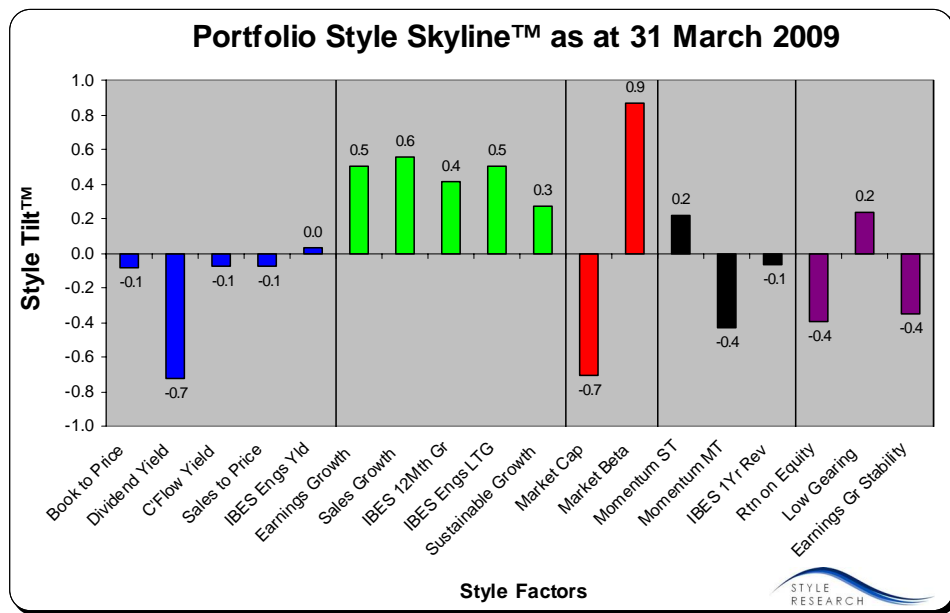
- The term “coverage” referred to in the charts contained within Section 5.3 is a measure of the Equity Segment’s exposure to the indices against which it is benchmarked. The output shown in Section 5.3 indicates a coverage level of circa 88% indicating that the Equity Segment has an overlap of circa 88% with the constituents of the indices against which the Equity Segment is benchmarked. Please refer to Appendix C for a more detailed explanation of the term “coverage”.
- The market capitalisation distribution of the Pension Fund and benchmark is illustrated in the charts shown in Section 5.4. The first chart shows a breakdown to the largest 40%, the next 40% and smallest 20% sized companies, as measured by market capitalisation. The second chart shows a breakdown of the largest 80% and the smallest 20% size companies, as measured by market capitalisation, and broken down between value and growth.
- The final chart shown in Section 5.5 analyses the risk profile of the Equity Segment of the Pension Fund as at 31 March 2009, 30 June 2009, 30 September 2009 and 31 December 2009 and breaks it down into its key risk Segments. In addition, the risk profile of the Equity Segment of the Pension Fund as at 31 December 2007 and 31 December 2008 are also shown to highlight changes over the last three years. For further explanation of Style Research Portfolio Analysis definitions please refer to the Appendix.

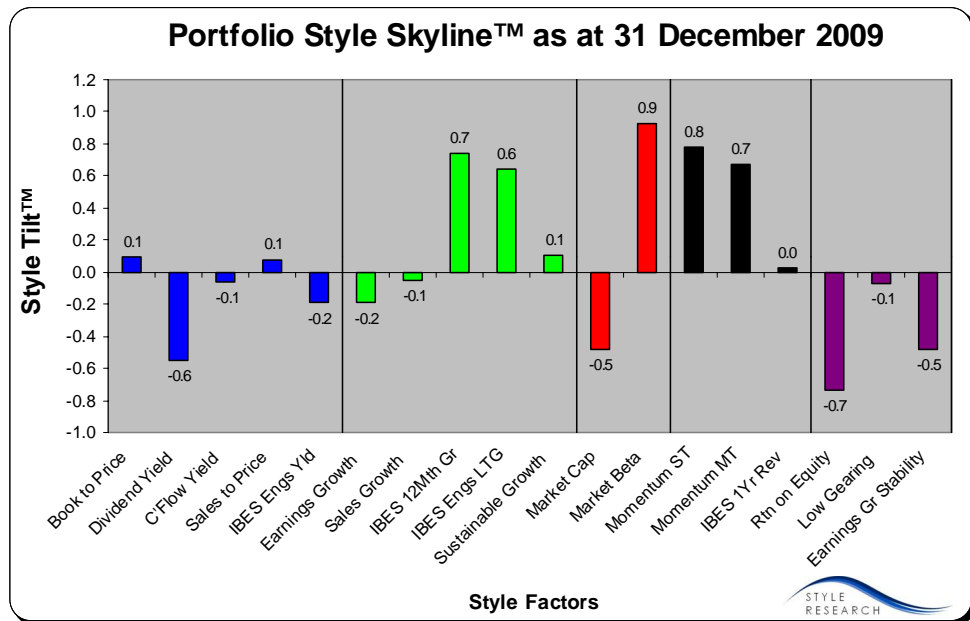
**Notes on data sources:**

- Security holdings have been sourced from BNY Mellon Asset Servicing © Copyright 2010.
- Benchmark data has been sourced from FTSE and adjusted to match the regional weightings as used by Norges Bank.
- Risk Model output has been sourced from SRPA.

**5.2 The portfolio style skyline**

To demonstrate the development of the Equity Segment’s style and risk characteristics, the portfolio style skylines as at the end of each quarter during 2009 are shown below. Please note that each quarter’s analysis is based on a historical “snap-shot” of the stocks held in the Equity Segments at an aggregate level as at the end of each quarter.





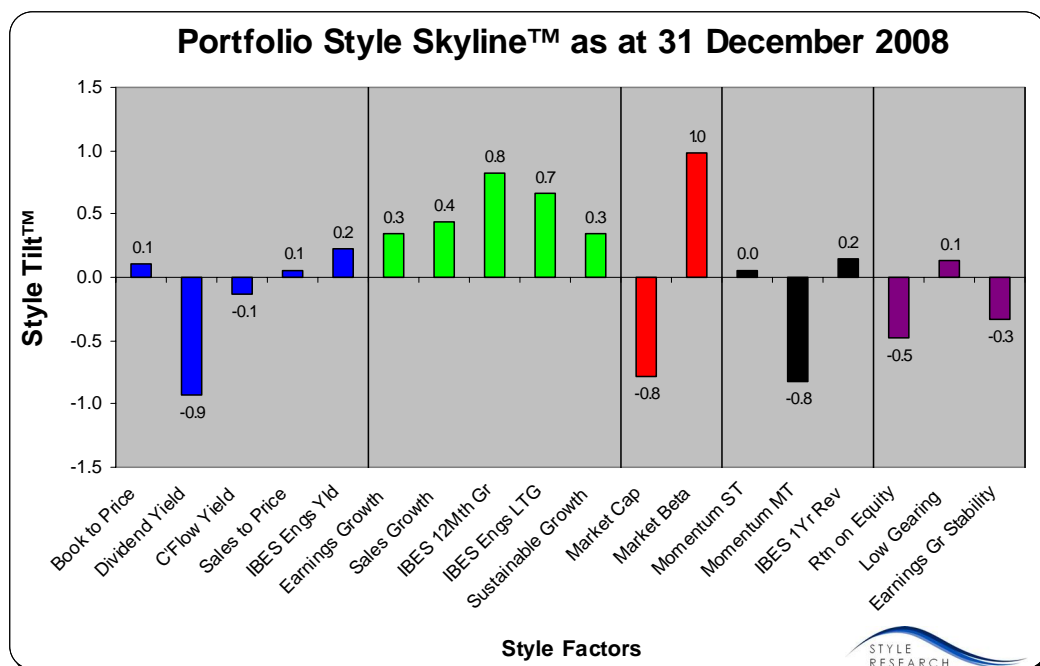
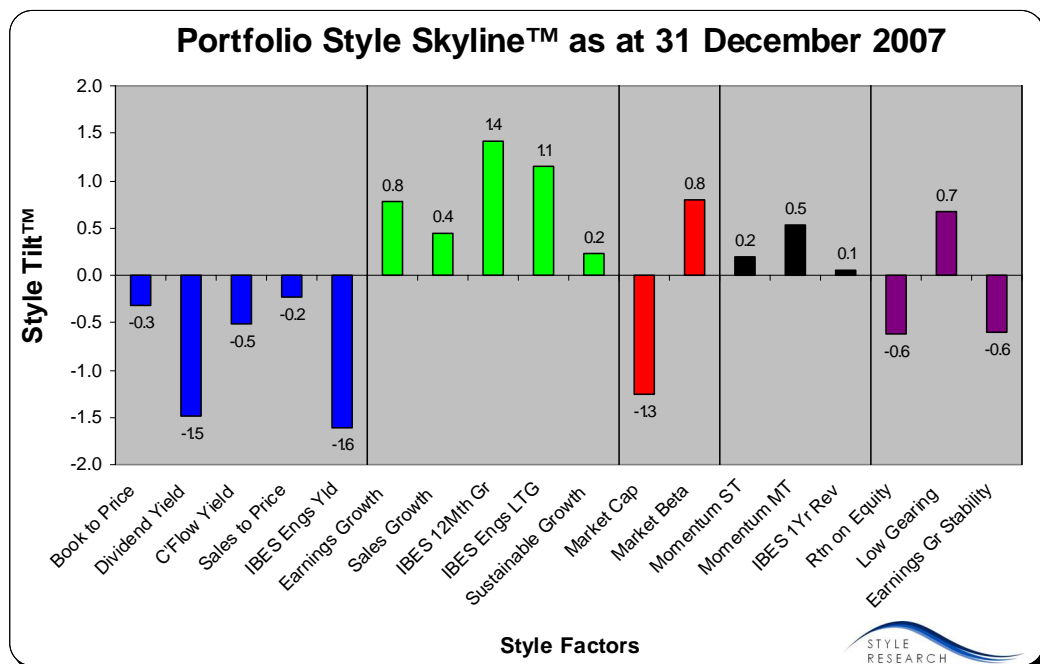
- Continuing the trend observed in 2007 and 2008, the Equity Segment's tilt away from value stocks and towards growth stocks became less pronounced over 2009 with the portfolio skyline converging to a more neutral position.
- The Equity Segment displayed no statistically significant tilts through any of the four quarters of 2009 indicating the neutral position of the portfolio throughout the year relative to the benchmark. Statistically significant tilts are illustrated by standard deviations of greater than +/-1.
- The portfolio did not display a significant tilt towards any growth indicator, although all were positive throughout the first three quarters of 2009 implying an overall minor tilt to growth stocks during the earlier part of the year. However, this was not significant.
- Although not statistically significant throughout 2009, the portfolio continues to exhibit a negative value for the Market Cap indicator, a trend which has been more pronounced in previous years. The negative 'Market Cap' indicator shows that the Equity Segment has consistently held a bias to stocks with lower market capitalisations than the benchmark mean. The extent of this bias has decreased from previous years.
- The positive 'Market Beta' indicator have remained one of the strongest factors in the portfolio skyline which shows that the Equity Segment has on average been biased towards stocks with a beta higher than the benchmark mean. Market Beta can be characterised as sensitivity to movement in the total market. The extent of this bias decreased marginally throughout the year but has returned to the start year values at year end 2009.
- Although not statistically significant, the Short Term Momentum factor remained positive throughout the year while the Medium term momentum factor became positive towards the latter half of 2009. The positive positions of both factors at 31 December 2009 indicated that stocks held



over the past 6 months and 12 months have had a positive impact on performance.

- More detailed explanations of the terms used in the Portfolio Style Skyline such as 'Dividend Yield', 'IBES Earnings Yield', 'IBES 12 Month Growth Earnings targets', 'IBES Earnings Long Term Growth', 'Market Beta', 'Market Cap', 'Return on Equity' and 'Earnings Growth Stability' can be found in Appendix C.

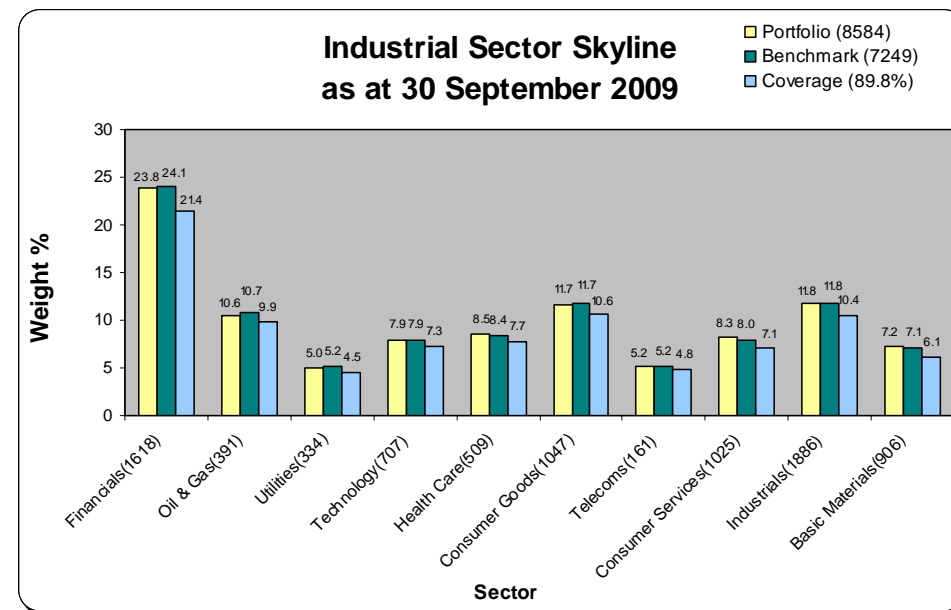
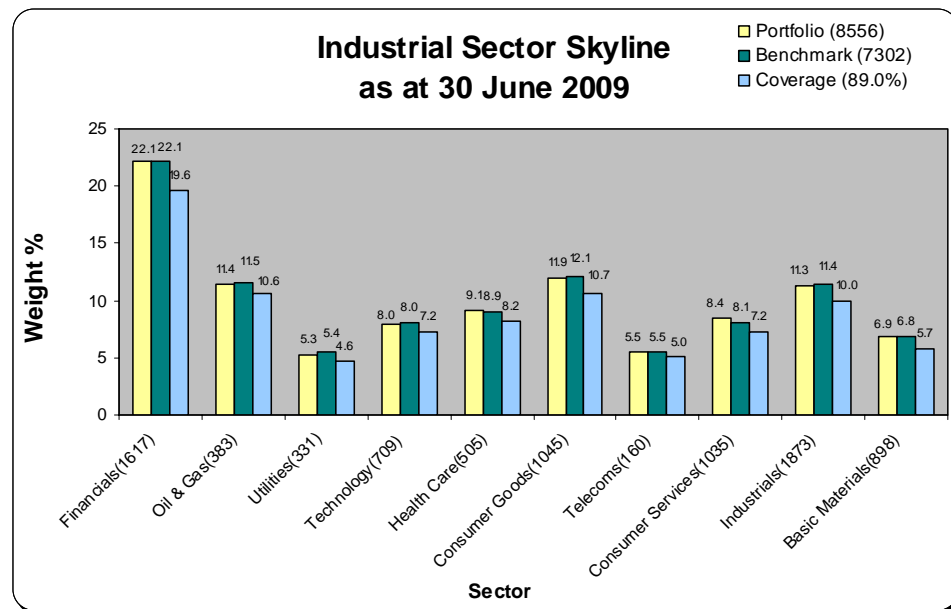
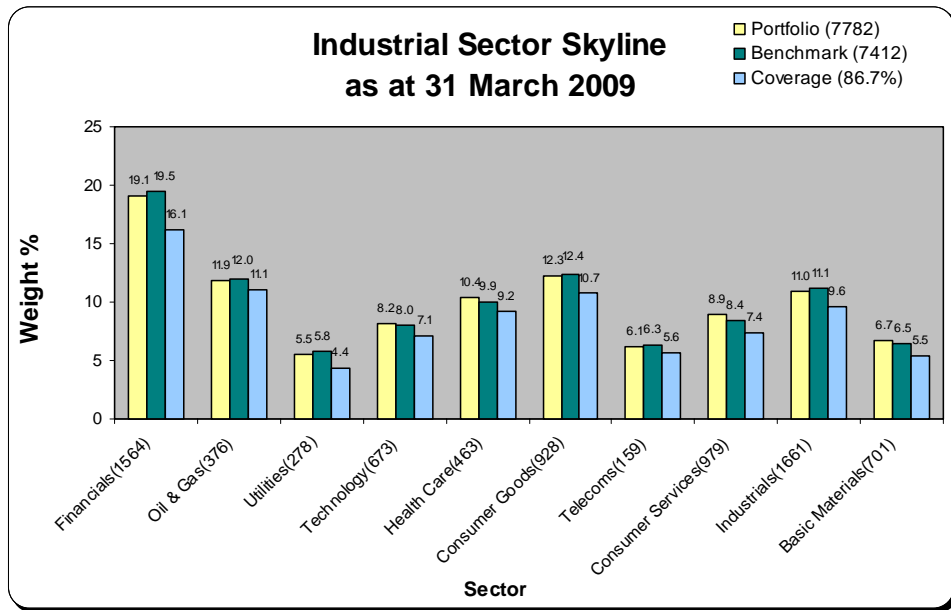
To demonstrate the development of the Equity Segment's style and risk characteristics over the last three years, the portfolio style skylines as at 31 December 2007 and 31 December 2008 are shown below.

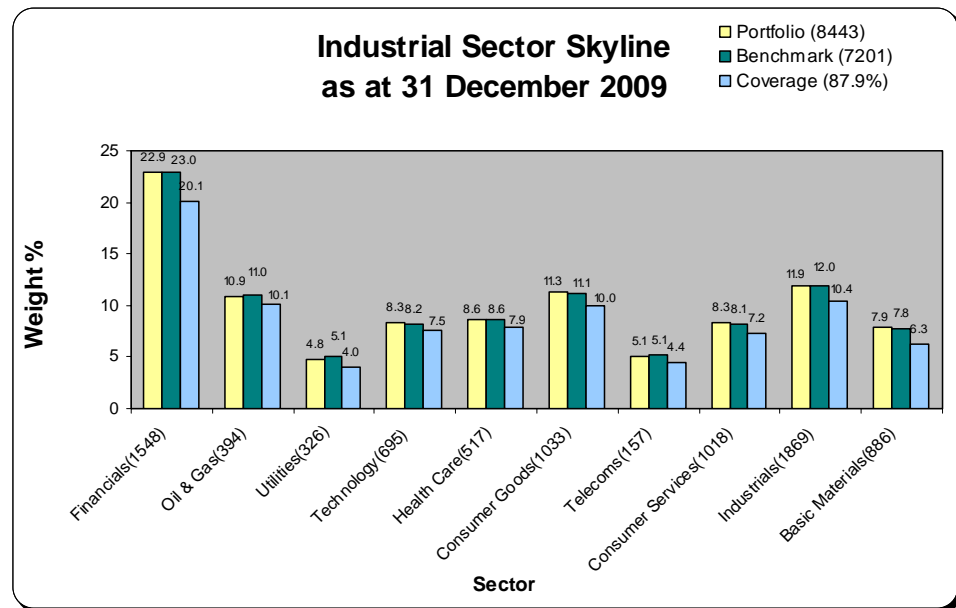


- The Equity Segment's bias towards growth and away from value factors reduced over 2007 relative to previous years. At each quarter end, the portfolio had a significant positive bias towards the growth factors, IBES 12 Month Growth and IBES Earnings Long Term Growth; and a significant bias away from the value factors Dividend Yield and IBES Earnings Yield, however the significance of each bias reduced over the course of the year.
- The Equity Segment converged to a more neutral position over 2008 with no significant value or growth factors as at year end. The Equity Segment displayed significant tilts away from Dividend Yield and IBES Earnings Yield as at the end of March and June 2008 respectively. The significance of each bias reduced over 2009.
- Prior to 2007, a consistent negative "market cap" indicator reflected the portfolio's bias towards small cap companies relative to benchmark. The extent of this bias decreased significantly when small cap stocks were included in the Equity Segment benchmark in the fourth quarter of 2007. This was against a market back-drop where smaller companies had a tendency to underperform the broader market benchmark. While a negative market cap indicator has remained a consistent feature of the Equity Segment, this factor was not significant during 2008 and whilst still negative, became even less statistically significant during 2009.
- The Equity Segment was biased towards stocks with a beta higher than the benchmark mean in 2008. While this factor was not statistically significant during 2009, the factor remains one of the most significant tilts at year end.
- Biases within the portfolio skyline of the Equity Segment have become progressively less significant over the last three years. In part, this can be explained by the extension of the benchmark universe to include small cap stocks in the fourth quarter of 2007 and emerging market stocks in the third quarter of 2008. These changes have resulted in a benchmark that more closely reflects the assets held within the Equity Segment.

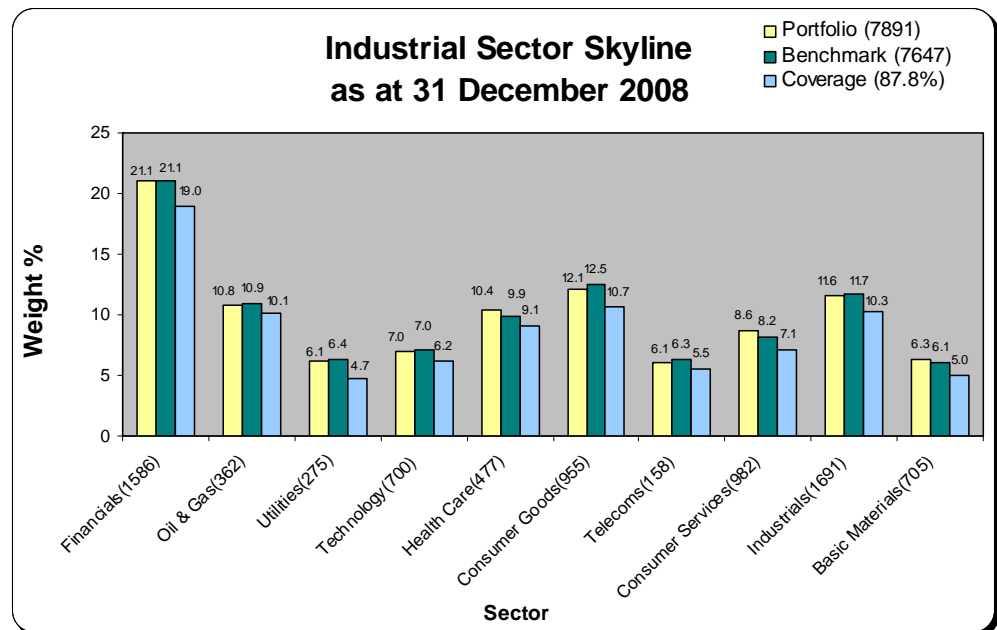
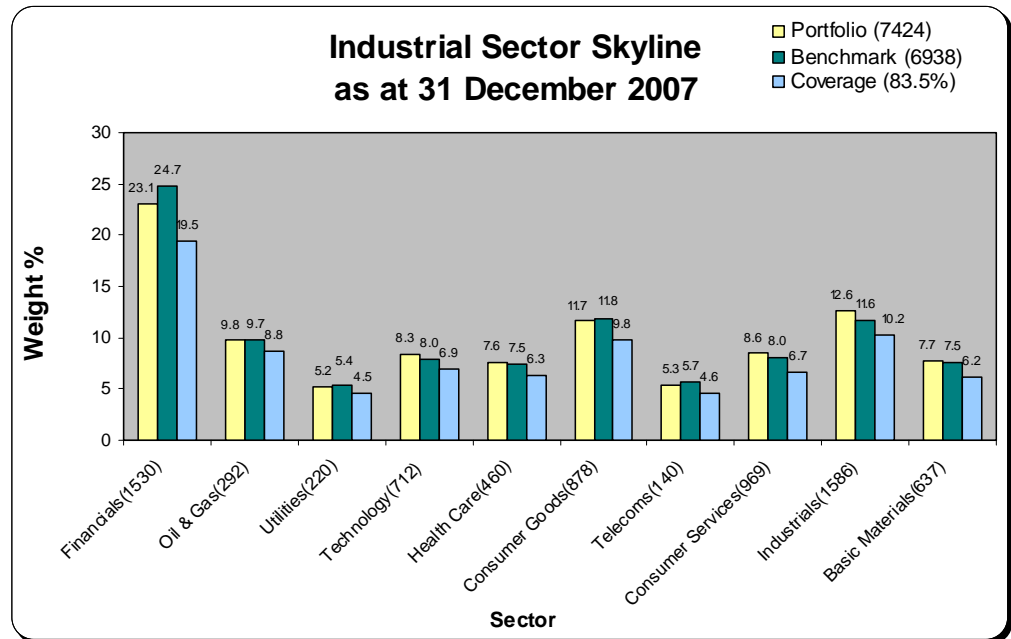
### 5.3 The portfolio sector skyline

To give a better impression of the development of the sector characteristics of the Equity Segment, industrial sector skylines as at the end of each quarter during 2009 are shown overleaf. Please note that each quarter's analysis is based on a "snap-shot" of the stocks held in the Equity Segment at an aggregate level as at the end of every quarter.





- Small cap companies were phased into the benchmark over the fourth quarter of 2007 and the first quarter of 2008. Further to this, the addition of emerging markets to the benchmark has resulted in a significant decrease in the number of countries held by the portfolio but not represented by the benchmark over the past three years. As at 30 June 2008, before the inclusion of emerging market countries in the benchmark, the portfolio was invested in sixteen countries that was outside of the benchmark universe. As at 31 December 2009, the benchmark included two countries that were not represented by the portfolio. Despite this, the number of stocks held in the portfolio continued to exceed the number of holdings in the benchmark at each quarter end over 2009.
- It is also evident that the number of stocks by which the portfolio exceed that of the benchmark has increased over 2009 while the number of stocks held in the benchmark remained relatively constant over the year.
- The industrial sector skyline has remained largely unchanged throughout 2009; furthermore, the charts illustrate that Norges Bank is not taking significant sector positions away from the benchmark in the management of the Equity Segment of the Pension Fund. Relative sector positions are similar to those taken during 2007 and 2008 (as shown in the analysis below).
- To demonstrate the development of the sector characteristics of the Equity Segment over the last three years, industrial sector skylines as at 31 December 2007 and 31 December 2008 are shown below.

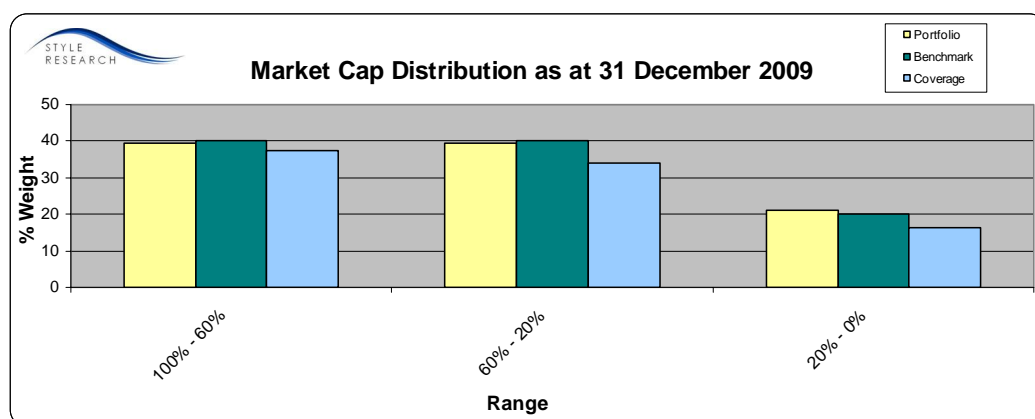


- Consistent with 2009, the number of companies held within the Equity Segment at the end of 2007 and 2008 exceeded the number of holdings within the benchmark. This corresponds with Norges Bank’s exposure to companies within emerging markets, which were not contained within the benchmark before the third quarter of 2008.
- Throughout 2007 and 2008, the industrial sector skyline remained largely unchanged; furthermore, the charts illustrate that Norges Bank did not take significant sector positions away from the benchmark in the management of the Equity Segment of the Pension Fund.

- As at 31 December 2007, the largest active sector positions included the Financials (-1.6%) Industrials (+1.0%) and Consumer Services (+0.6%) sectors. Overweighting Consumer Services is a continuation of the Equity Segment's long term position since 2005 and into 2009.
- As at 31 December 2008, the largest active sector positions included the Healthcare (+0.5%) Consumer Goods (-0.4%) and Consumer Services (+0.4%) sectors.
- As at 31 December 2009, the largest sector weight differences from the benchmark were Utilities (-0.3%), Consumer Goods (+0.2%) and Consumer Services (+0.2%) sectors.
- Coverage of the benchmark has increased from 83.5% as at 31 December 2007 to 87.9% as at 31 December 2009.

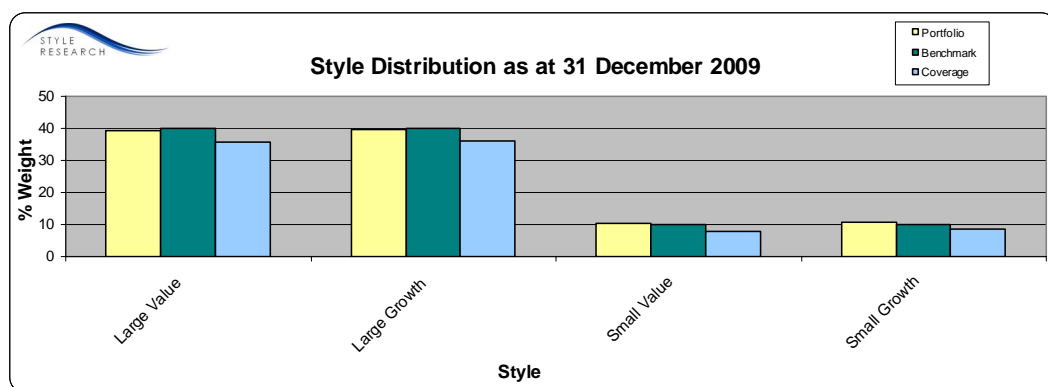
#### 5.4 Market capitalisation distribution

- The chart below describes the market capitalisation distribution of the Pension Fund and the benchmark. Smaller cap companies, as defined by SRPA, are the companies held within the portfolio that make up the bottom 20% of the market capitalisation of the portfolio. As at 31 December 2009, in this instance, a company with a market capitalisation of below circa 33bn NOK would be classified as being a small cap company.



- As at 31 December 2009, the Pension Fund was overweight small cap companies by 1.2%. A marginal small cap bias was observed throughout the year.
- A small cap bias has been observed throughout the last three years with an overweight position to small cap companies as at the end of 2007 of 2.5%. This bias has fallen significantly since 2007 due to the inclusion of small cap companies in the benchmark in 2007. The bias decreased to 0.6% as at 31 December 2008 and has increased marginally since then to a level of 1.2% as at the end of 2009.
- The chart overleaf describes the market capitalisation distribution of the Pension Fund and the benchmark in value and growth terms. Consistent with what has been described above, small cap companies, as defined by SRPA, are the companies held within the portfolio that make up the

bottom 20% of the market capitalisation of the portfolio. Conversely, large cap companies, as defined by SRPA, are the companies held by the portfolio that make up the top 20% of the market capitalisation of the portfolio.



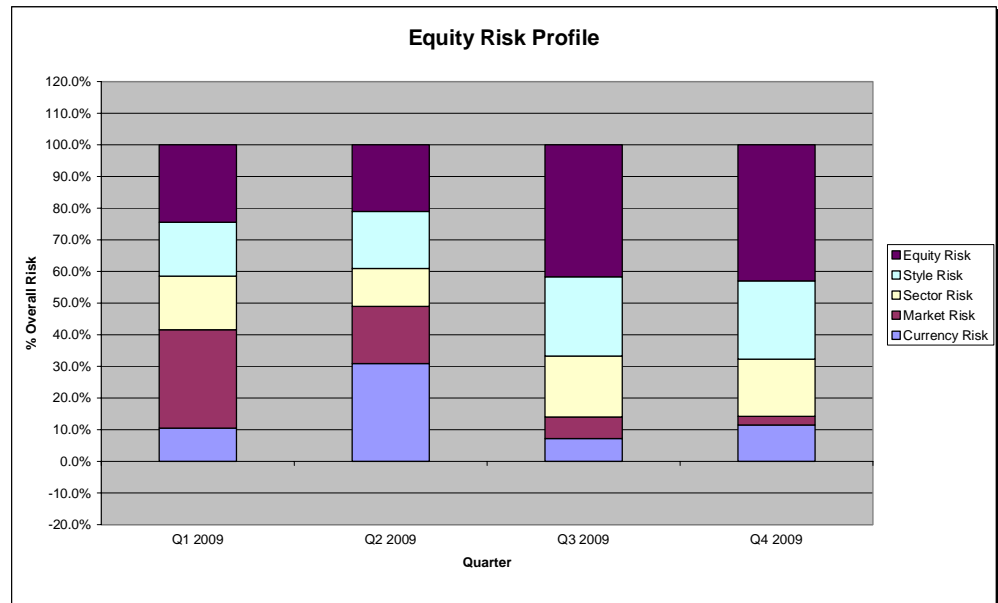
- As at 31 December 2009, the Pension Fund was marginally overweight in both small cap value and small cap growth companies and marginally underweight in both large cap growth and large cap value companies. A bias towards small cap growth companies is consistent with the position as at 31 December 2007 and 31 December 2008.

## 5.5 The Pension Fund – equity risk profile

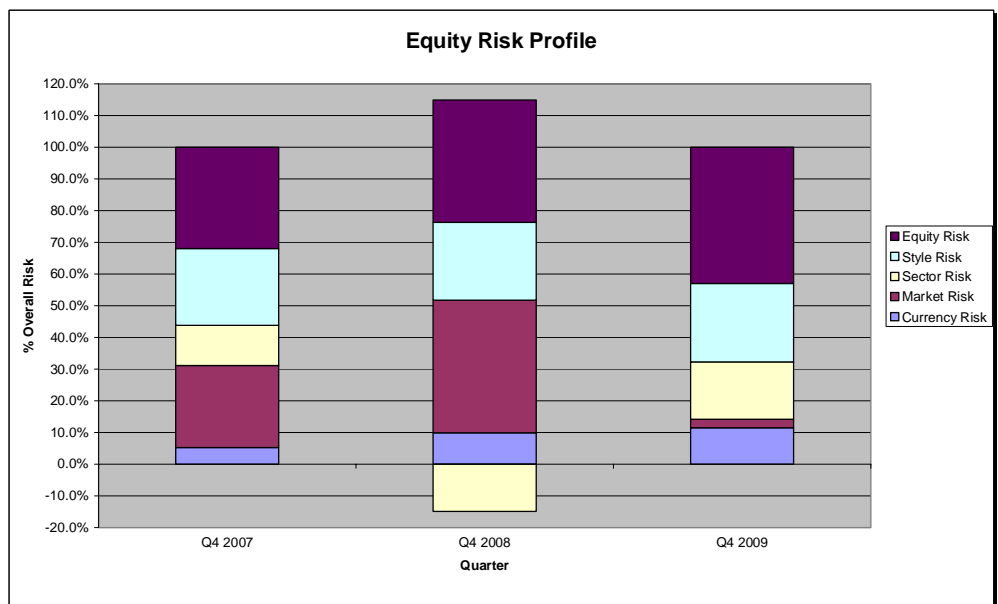
- Portfolio risk can be decomposed into contributions from Stock Selection (“Equity Risk”), Style Tilts, Sector Allocation, Market Allocation and, for multi-currency portfolios Currency Allocation. The Equity Risk Profile charts below decomposes the Tracking Variance (the square of Tracking Error) into these components and expresses them as percentages of the overall Tracking Variance. The actual risk level is dependent on the level of deviation from the benchmark and the correlation between the position the Equity Segment has taken and the benchmark position.
- A brief explanation of the risk terms referred to are as follows:
  - Currency Risk is the risk created by holding assets denominated in different currencies in different proportions to the benchmark.
  - Market Risk is the risk created by investing in different markets, or asset classes, in different proportions to the benchmark.
  - Sector risk is the risk created by taking different industrial sector positions to the benchmark.
  - Style Risk is the risk created by investing in stocks with different style attributes to the benchmark. For example, overweight growth stocks would cause style risk.
  - Equity Risk is stock specific risk from individual stocks and is the residual risk after assigning risk to the categories described above.
- The first chart below shows the risk in the Equity Segment broken down into different factors or segments as at the end of each quarter of 2009.

The second chart shows the contribution to risk as at 31 December 2007, 31 December 2008 and 31 December 2009. Details of the methodology behind the analysis are set in Appendix C.

- The analysis is prepared according to a SRPA risk model for multi-market risk attribution and provides a “snap - shot” breakdown of the different segments of portfolio risk relative to benchmark.



Note: Security holdings are sourced by (c) Copyright 2010 BNY Mellon Asset Servicing. Benchmark data sourced from FTSE; Risk model output sourced from SRPA.



Note: Security holdings are sourced by (c) Copyright 2010 BNY Mellon Asset Servicing. Benchmark data sourced from FTSE; Risk model output sourced from SRPA.

- The introduction of emerging markets to the benchmark in the third quarter of 2008 resulted in Sector risk becoming negative as at the end of 2008. The calculation methodology used takes into account the correlation of each risk term with other risk terms. The order in which



risks are measured does affect the outcome to some extent because we look at incremental additions to risk (we calculated risk in the following order: currency, market, sector, style, equity). The correlation between Style Risk and Sector Risk has impacted the Sector Risk value to the extent that Sector Risk is shown as negative and therefore the sector positions taken reduced overall the risk taken as at the end of the third and fourth quarters. The net value of all risk components each quarter is 100%.

- Style risk was the largest component of risk throughout 2007, until the last quarter (when the benchmark changed) at which point Equity risk became the most prominent. Throughout 2008 and 2009, the Style risk component has been broadly consistent. During 2008, Market risk was the dominating contributor to risk. This has reduced significantly during 2009 to become the smallest contributor to risk at year end. Equity risk has now become the most significant contributor to risk.
- In previous years and on a consistent basis since 2004, Currency Risk remained the smallest component of total risk. This has now been replaced by Market risk as the smallest contributor and although Currency risk fluctuated during the second quarter of 2009, it's contribution remains relatively small at year end and similar to as at the end of 2008.
- Throughout 2009, and consistent with the previous year, the main contributor to risk (as calculated by SRPA), from a size and style perspective, was an active position in larger cap growth and a tilt away from larger cap value (the portfolio was underweight large cap growth until emerging markets were introduced to the benchmark in the third quarter of 2008 upon which the portfolio became overweight large cap growth).
- The risk profile of the portfolio should be assessed within the context of the absolute predicted tracking error as measured by SRPA as at each quarter end. Over 2007, the predicted tracking error of the Equity Segment was c 0.7% p.a. Over 2008, the predicted tracking error fell to c 0.3% p.a. which can be attributed, in part, to the widening of the portfolio and benchmark investment universe resulting in the portfolios holdings more closely reflecting that of the benchmark. The predicted tracking error has remained at c 0.3% p.a. as at year end 2009, reducing somewhat from a level of c 0.5% as at the end of the first quarter 2009. It should be noted that due to the relatively small predicted tracking error over 2009, the analysis is more sensitive to the contribution to risk of each component.

6

## Pension Fund assets under management

The table below shows the market value of the Pension Fund as at the end of every month during 2009.

Month	Market value (NOK Millions)		
	Equity	Fixed income	Total fund
January	1,036,900	1,067,924	2,104,823
February	1,006,164	1,031,826	2,037,990
March	1,091,471	985,110	2,076,581
April	1,256,369	940,747	2,197,116
May	1,364,803	944,052	2,308,855
June	1,437,418	947,639	2,385,057
July	1,511,634	955,323	2,466,957
August	1,556,055	967,341	2,523,396
September	1,579,231	967,013	2,546,244
October	1,531,339	967,681	2,499,020
November	1,580,812	1,012,875	2,593,687
December	1,644,048	995,855	2,639,904

Data source: Calculations by BNY Mellon Asset Servicing. (c) Copyright 2010 BNY Mellon Asset Servicing

## Norwegian Ministry of Finance – Explanation of differences

BNY MAS will adjust data from the custodians in order to maintain consistency with Norges Bank in two situations:

- i. In the case of write downs of Mortgage Backed Securities (“MBS”), this is explained in more detail below; and
- ii. The value of swaps held with Citibank is agreed between Citibank and Norges Bank after Citibank release valuation statements to BNY MAS. BNY MAS will use the valuations agreed between Citibank and Norges Bank.

In any other situation, differences between custodian data and equivalent data at Norges Bank will result in differences in market values and performance reported between BNY MAS and Norges Bank, the majority of which can be explained by one or a combination of reasons which include the following (where relevant we also discuss differences in transfer values reported):

- Norges Bank discounts income from sell/buy backs and buy/sell backs whilst Citibank uses an accrued income accounting methodology.
- Changes in swap prices which occurred after Citibank closed their books.
- Citigroup uses their own systems to calculate accrued interest whilst Norges Bank’s performance systems use Bloomberg.
- Delays in reporting on hedge fund Net Asset Values, thus not correctly reported by JP MorganChase.
- Estimated income from securities lending allowed for by Norges Bank but not allowed for by the custodians.
- Throughout the year differences in transfer values were observed between those values reported by Norges Bank and those reported by JP Morgan to BNY MAS. This was due to interest rate compensation that JP Morgan includes in transitions, which Norges Bank does not.
- The performance methodology employed by BNY MAS makes an assumption that all cash flows (arising from transfers/rebalancing between the Fixed Income and Equity Segments of the Pension Fund and the transfer of newly generated capital into the Pension Fund) occur at month end. Until June 2009, the performance methodology employed by Norges Bank did not make this assumption. Therefore, any cash flows occurring mid month until June 2009 can lead to differences between the performance returns calculated by BNY MAS and Norges Bank in the range of 0.10% to 1.00%. Since July 2009, all cash flows have been assumed to take place at month end by both Norges Bank and BNY MAS.
- A decline of liquidity in the MBS market, on the back of the credit crisis which began in the latter half of 2007, caused the pricing of MBS securities to become difficult and not necessarily to provide a true representation of their fair market value. This has prompted Norges Bank to perform a write down against the Pension Fund’s MBS holdings as at the end of each month throughout 2008 and to the end of July 2009, to what Norges Bank view as fair market value. After this date, write downs have taken place at custodian level. This write down process did not take place at the custodians and therefore differences existed between BNY MAS’s reported market

values (calculations based on custodian data) and those reported by Norges Bank. To overcome this discrepancy, and to allow BNY MAS's calculations to reflect the fair market value adjustments made by Norges Bank, BNY MAS have sourced the write down values from Norges Bank and applied them to their custodian sourced data for both valuation and performance calculations. The adjustments made by Norges Bank occur after data has been published by the custodians. The performance returns provided within the body of this report therefore include the write downs at Norges Banks.

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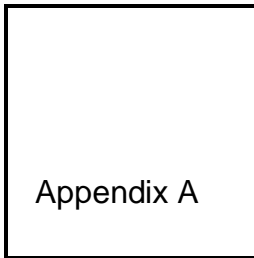
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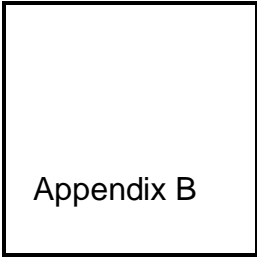


## Calculation methodology

BNY MAS employs the “time-weighted” rate of return as the base performance statistic. This return takes into account investment income as well as realised and unrealised capital profits or losses. The use of this statistic minimises distortions due to cash flows into and out of a portfolio which are, in general, outside the control of the investment manager.

Exact calculation of the time-weighted rate of return requires a full valuation of the portfolio whenever a cash flow occurs. As a practical alternative BNY MAS employs an approximation to the time-weighted return, using monthly valuations, monthly/daily transaction details and monthly/daily cash flows. The method used is based on the Regression Method, recommended by the Bank Administration Institute in their definitive report on the topic of performance measurement published in 1968, and which gives an excellent approximation of the time-weighted rate of return.

At the total fund level BNY MAS calculates time-weighted return using market values at the start and end of the month and net injection details.



## Appendix B

### Mercer's role and control function

The purpose as set out in the Public Procurement document is for Mercer to verify Norges Bank's internal performance measurements and to strengthen the Ministry's basis for evaluating the competence and actions of Norges Bank. Mercer outsources the role of performance verification to BNY MAS, an independent performance measurer appointed by Mercer.

Mercer has, in conjunction with BNY MAS, performed control and verification functions throughout 2009, in accordance with the terms of the contract awarded by the Ministry.

The objective of this process has been to check Norges Bank's internal performance measurements and to perform wider verification checks, both at portfolio and benchmark level according to instructions received from the Ministry of Finance.

### BNY MAS' role and control function

#### **BNY MAS' role**

The function of calculating and verifying Norges Bank's internal performance measurement is carried out by BNY MAS, under the guidance of Mercer, who retain overall responsibility for the process. BNY MAS calculates performance for the Pension Fund based on portfolio data and market values supplied by the custodians, JP Morgan Chase and Citibank. Note: with effect from October 2009, all portfolio data and market value are supplied by a single custodian, JPMorgan Chase.

BNY MAS employ the "time weighted" rate of return as the base performance statistic. This return measure is consistent with the one employed by Norges Bank and takes into account investment income, as well as realised and unrealised capital profits or losses. The use of this statistic minimises distortions due to cash flows into and out of a portfolio which are, in general, outside the control of the investment manager.

### BNY MAS' control function

#### **Market value reconciliation check**

Having constructed performance data, BNY MAS will check that the total values for the various segments of the fund agree with those values calculated by Norges Bank. BNY MAS also check that the total value for the fund agrees with Norges Bank's calculated value.

Any significant reconciliation errors here may indicate that there are accounts omitted from the data supplied. If the overall difference is more than a 0.01%, BNY MAS will raise queries with the data providers.

## **Transfers**

When transfers occur at the month end BNY MAS ensure that the transfers into the fund shown in the data agree with those detailed in the letter supplied by Norges Bank. BNY MAS create their own independent verification of the transfer portfolio.

### **Fund return checks**

In addition to the data checks above, BNY MAS carry out sense checks on individual asset class and total returns.

#### **Asset class return check**

BNY MAS carry out sense checks on returns for individual asset classes against the relevant index return. If the asset class return is unexpectedly divergent from the index return then BNY MAS will raise a query with the relevant data provider.

#### **Total return check**

After constructing data for individual portions of the fund, BNY MAS produces a consolidated data set for the fund as a whole. BNY MAS check that the total return calculated for each month is no more than one basis point different to the total return quoted by Norges Bank.

### **Benchmark checks**

#### **Pension Fund benchmark**

##### **Fixed income benchmark**

Following provision by Norges Bank of the methodology for calculation, from first principles, of the Fixed Income benchmark weights, BNY MAS set up their own independent verification spreadsheet calculations.

BNY MAS have independently sourced the Lehman Aggregate indices (Barclays Capital Global Aggregate indices from 20 September 2008) that constitute the fixed income benchmark. These have been sourced directly from the Lehman Live website. Using monthly weights and Barclays Capital Global Aggregate indices, BNY MAS will calculate Fixed Income benchmark returns in NOK terms.

On completion of the reconciliation exercise BNY MAS will verify agreement to the Fixed Income benchmark weights and benchmark returns by email notification. If returns and/or weights cannot be agreed then BNY MAS will communicate their findings with commentary.



### **Equity benchmark**

Following provision by Norges Bank of the methodology for calculation, from first principles, of the Equity benchmark weights, BNY MAS have set up their own independent verification spreadsheet calculations.

Customised regional benchmark index values in US\$ terms up to November 2003 calculated by FTI have also been forwarded by Norges Bank. FTSE took over provision of customised benchmark indices from December 2003 onwards. From December 2003 onwards BNY MAS have received customised benchmark indices directly from FTSE.

On completion of the reconciliation exercise BNY MAS will verify agreement to the Equity benchmark weights and benchmark returns by email notification. If returns and/or weights cannot be agreed then BNY MAS will communicate their findings with commentary.

### **Overall Pension Fund benchmark**

Following provision by Norges Bank of the methodology for calculation, from first principles, of the overall benchmark weights, BNY MAS have set up their own independent verification spreadsheet calculations.

Using monthly weights and Fixed Income and Equity benchmark returns calculated above, BNY MAS will calculate overall benchmark returns.

On completion of the reconciliation exercise BNY MAS will verify agreement to the overall benchmark weights and benchmark returns by email notification. If returns and/or weights cannot be agreed then BNY MAS will communicate their findings with commentary.

### **Environmental Fund benchmark (prior to 1 December 2004)**

From December 2003 onwards BNY MAS have received customised benchmark indices directly from FTSE. Benchmark returns are calculated by dividing out customised total return indices in NOK.

As of end November 2004 the Environmental Fund was merged with the Pension Fund and hence since 1 December 2004 this control function ceased to exist.

### **Combined Total Fund benchmark**

Prior to 1 December 2004, BNY MAS calculate the Combined Fund total return benchmark on a monthly basis by weighting the Pension Fund and Environmental Fund total benchmark returns by their respective start market values. Since then the Total Fund benchmark is the same as the overall Pension Fund benchmark.



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### **The Norwegian Government Pension Fund - Global – BNY Mellon Asset Servicing role during 2009**

#### Our role in 2009

During 2009, BNY Mellon Asset Servicing “BNY MAS” have provided independent performance measurement in respect of the Norwegian Government Pension Fund – Global.

To perform this task BNY MAS collect data on a monthly basis from five data sources namely: JP Morgan Chase, Citigroup, Barclays Capital, FTSE and Norges Bank “the data suppliers”.

A significant development over 2009 was the move to a single fund custodian which was completed in October 2009. JP Morgan Chase will be the single fund accountant for both the Fixed Income and Equity segments of the fund which should lead to more consistency.

BNY MAS undertake a number of reconciliation checks on the data, at asset class level and where available at security level, ensuring that data reconciles from the previous month, and at the total level. Any questions that arise from these checks will be raised with the data suppliers and where appropriate the client.

BNY MAS employs the “time-weighted” rate of return as the base performance statistic. This return takes into account investment income as well as realised and unrealised capital profits or losses. The use of this statistic minimises distortions due to cash flows into and out of a portfolio which are, in general, outside the control of the investment manager.

Exact calculation of the time-weighted rate of return requires a full valuation of the portfolio whenever a cash flow occurs. As a practical alternative, BNY MAS employs an approximation to

the time-weighted return, using monthly valuations, monthly/daily transaction details and monthly/daily cash flows. The method used is based on the Regression Method, recommended by the Bank Administration Institute in their definitive report on the topic of performance measurement published in 1968, and which gives an excellent approximation of the time-weighted rate of return.

At the total fund level BNY MAS calculates time-weighted returns using market values at the start and end of the month and net injection details.

BNY MAS also carry out a number of independent checks on Norges Bank's benchmark return calculations. We independently source FTSE-AW indices (FTSE All Country (FTSE-AC) from 31 December 2008) and Barclays Capital customised indices in order to carry out a check on the Equity and Fixed Income benchmark returns. We then apply relative Fixed Income and Equity weights within the Norwegian Government Pension Fund - Global to calculate the overall benchmark. Following provision by Norges Bank of the methodology for calculation of the Fixed Income, Equity and Overall benchmark weights we have now set up our own independent spreadsheet checks to verify these weights. BNY MAS also independently calculate the fund and benchmark returns in the currency basket.

#### Performance discrepancies in 2009

Different valuation methodologies between Norges Bank and Citigroup in respect of money market instruments may give rise to differences in market value between BNY MAS and Norges Bank reporting. These in turn may lead to small differences in return between BNY MAS and Norges Bank. These are usually no more than 0.01% to two decimal places.

Differences in methodologies used by Norges Bank and BNY MAS in the treatment of cashflows can also give rise to differences in returns. For the twelve months to 31 December 2009, equity returns calculated by BNY MAS and Norges Bank differed by 0.02% in NOK terms. The majority of this difference can be attributed to the timing of a significant cashflow which occurred during February, March, April and June.

The different methodologies in the calculation of currency rates between BNY MAS and Norges Bank may give rise to differences in currency returns. Essentially this problem stems from the fact that Norges Bank is using a different base currency in their calculations from BNY MAS. The small differences are usually no more than 0.01% to two decimal places.

For 2009, Fixed Income returns calculated between BNY MAS and Norges Bank differed by 0.39% in NOK terms. The majority of this difference can be attributed to the transfer of bonds from JPMorgan Chase to Citigroup in April and July. JPMorgan Chase reported these transfers using historic exchange rates to value the bonds, while Citigroup used current exchange rates.

The difference between BNY MAS and Norges Bank can also be attributed to the timing of significant cashflows which occurred during February, March, April and June and the difference between how Norges Bank and BNY MAS allowed for these cashflows within their respective performance calculations.

For a number of individual months there were return discrepancies between BNY MAS and Norges Bank (measured in both Norwegian Kroner and the currency basket measure) of greater magnitude than 0.01% for reasons other than those set out above.

Twelve month Total Fund returns for the Norwegian Government Pension Fund - Global differed between BNY MAS and Norges Bank by 0.14%<sup>3</sup> in NOK terms. This difference is mainly attributed to the transfer of bonds from JPMorgan Chase to Citigroup in April and July.

Yours sincerely  
Stephen Hayes-Allen

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<sup>3</sup> Figures may not sum due to rounding

Appendix C

## Style research portfolio analysis definitions

### Value criteria

#### **Book to price**

The ratio of the company's Book Value (the sum of Shareholders' Equity plus accumulated Retained Earnings from the P & L Account) to its Share Price.

This Factor has been one of the most successful measures of the intrinsic Value of company shares.

#### **Dividend yield**

The annual Dividend Paid per Share divided by the Share Price.

This Factor measures the Value of company shares according to the stream of dividend income resulting from share ownership.

#### **Cash flow yield**

Annual Cash Flow per Share divided by the Share Price.

This Factor is related to the earnings yield but also includes other items, specifically: depreciation, amortisations, and provisions for deferred liabilities. It is intended to capture the cash availability of the company as a multiple of the share price, and offers a Value criteria based on the stream of accessible cash earnings.

#### **Sales to price**

Net Sales per Share divided by the Share Price.

This Factor measures the worth of a company's shares according to the annual sales volume supporting the company business. The item is considered by many analysts to be less susceptible to manipulation than other valuation criteria; it is, however, a less comprehensive measure of a company's range of activities.

#### **IBES earnings yield**

The consensus 1 year forecast annual earnings per share divided by the share price.

## Growth criteria

### Earnings growth

The average annual growth rate of Earnings over a trailing three years.

Earnings Growth is, perhaps, the clearest of the Growth criteria. However, it is subject to the distortions of reporting conventions and manipulation and, particularly in some markets, only known after a considerable lag.

### Sales growth

The average annual growth rate of Net Sales per Share over a trailing three years.

Although growth in sales per share might be only a narrow measure of a company's business growth, and may be subject to a number of distortions, it is less subject to differences in reporting conventions or manipulation than many other Balance Sheet or Profit and Loss items.

### Earnings growth

**IBES 12Mth Growth** – The IBES consensus forecast growth over the next 12 months. This is calculated on a pro-rata basis from the forecasts for each company's next 2 annual reporting periods.

**IBES earnings long term growth** – This factor takes the longest available 2 year earnings growth forecast for a stock. For stocks with a 5 year forward consensus forecast the growth rate will be calculated from fiscal year 3 to fiscal year 5. For stocks with a 4 year forward consensus forecast the growth rate will be calculated from fiscal year 2 to fiscal year 4. For stocks with a 3 year forward consensus forecast the growth rate will be calculated from fiscal year 1 to fiscal year 3. If forecasts are not available for fiscal years 3 to 5, then the factor is set to null.

**Sustainable growth** – This is defined as follows: Sustainable Growth Rate =  $[RoE] * (1 - (DPS/EPS))$  RoE = Return on Equity, DPS = Dividend per share, EPS = Earnings per share This Growth factor aims to provide an insight into the future growth potential of a company. The rationale behind this is that the growth rate one can reasonably expect from a company, assuming it is able to generate a return on equity similar to the recent past, is related to how much of its profits are reinvested back into the company.

## Size &amp; risk criteria

**Market Cap**

The market capitalisation of a stock.

The Market Cap statistic of the portfolio is the weighted (by holding value) average size of the securities held. The Market Cap statistic of the benchmark (or total market) is the weighted (by holding value) average size of the securities within the benchmark (or total market).

**Market Beta**

The “slope coefficient”, ( $\beta$ ), from the simple regression:

$$\text{Security Monthly Return} = \alpha + \beta * \text{Market Monthly Return} + \text{Random Error}$$

The regression is carried out over rolling 36 month periods; where sufficient information is not available,  $\beta=1$  is assumed.

## Performance record criteria

**Momentum ST**

Short Term Momentum is calculated using a 6 month "memory" of monthly total returns. The past period returns are weighted using a "decay ratio" of 2/3, per month. This weighted historic return factor measures the degree of performance trend following. It is useful in recognizing trading character of specific markets and in noticing occasional changing patterns through the market cycle.

**Momentum MT**

**Medium Term Momentum** is the 12 month total return of the stock.

**Historic relative**

The Historic Relative Return is calculated using a 6 month **Return** “memory” of monthly relative returns. The past period returns are weighted using to a “decay ratio” of 2/3, per month.

This weighted historic relative return factor measures the degree of simple price performance trend following. It is useful in recognising the trading character of specific markets and in noticing occasional changing patterns through the market cycle.

The international equity analysis shows short-term and medium term momentum factors.

**IBES 1 Year Earnings revisions**

IBES balance of Earnings forecast revisions for the next annual reporting period. It is calculated as the difference between the upwards revisions minus the downwards revisions (as sampled over the past 3month period), expressed as a percentage of the number of estimates.

## Quality criteria

### Return on equity

Net Income before Preferred Dividends divided by the Book Value of Shareholders' Common Equity.

Return on Equity measures the profitability of the operations of the company as a proportion of the total amount of equity in the company. Since Return on Equity multiplied by the reinvestment rate (the proportion of earnings not paid as dividends but reinvested in the company) gives the warranted growth rate of a company, Return on Equity is a very usual measure of a company's growth potential.

### Low gearing

The negative of Debt to Equity. Low geared companies can be regarded as being of higher 'Quality' as they are less burdened by debt repayment costs.

### Earnings growth stability

This 'Quality' factor is calculated as the negative of the standard deviation of Earnings Growth over the most recent 3 years of growth data.

### Risk terms

Currency risk (the extent to which currency exposure differs from the benchmark)

Market risk (the extent to which the portfolio's exposure to different equity markets differs from the benchmark)

Sector risk (the extent to which the portfolio's exposure to different industries differs from the benchmark)

Style risk (the extent to which the portfolio's style biases (see graph on previous page) introduce risk relative to the benchmark)

Equity risk (risk arising from stock-specific factors)

However, the different segments of risk are not independent. For example, sector risk can itself introduce currency risk if the sector has a bias to companies with non-domestic currency exposure.

### Coverage

The term "coverage" is a measure of the portfolio's exposure to the indices it is benchmarked against i.e. if a benchmark index had only 2 stocks, both of equal weighting, each stock would have a market capitalisation of 50%. If a portfolio worth 100 NOK held 50 NOK in each stock its coverage would be 100%. If the portfolio invested all the 100 NOK in just one stock its coverage would be 50% as it is only exposed to the movements of the 50% of the benchmark index. Further, if the portfolio was invested 60 NOK in one stock and 40 NOK in the other the coverage would still be 50% in the first stock, but 40% in the other making a total of 90% coverage.



## Multi-Market risk attribution

The return of stock  $j$  may be written in terms of its currency, market, industry, style and specific returns (dropping subscript  $t$  for convenience)

$$r_j = R_{C(j)}^\phi + R_{M(j)} + R'_{I(j)} + R'_{S(j)} + r'_j$$

Where company  $j$  belongs to market  $M(j)$ , industry  $I(j)$  and style  $S(j)$ . The Portfolio base currency is  $\phi$  and the currency of market  $M(j)$  is  $C(j)$ . Industries are according to the 10 economic sectors as defined by FTSE International. Styles are defined within each economic sector according to Large Value, Large Growth, Small Value, Small Growth. Size is the primary sort, where Large is the top 80% by capitalization and Small the bottom 20%. Value is taken to be the top half, by capitalization, of each size category, sorted by a measure which is 60% normalized Book Value per Share to Share Price and 40% normalized Dividend Yield, and rebalanced every 6 months; Growth is simplified as the other half within each size category.

The month  $t$  currency return is defined as:

$$R_{C(j)}^\phi = \frac{er_{C(j),t}^\phi - er_{C(j),t-1}^\phi}{er_{C(j),t-1}^\phi}$$

Where the exchange rate of currency  $\phi$  to currency  $C(j)$ , at the end of month  $t$ , is  $er_{C(j),t}^\phi$

In matrix notation the Equity returns are:

$$\mathbf{r} = \mathbf{R}_C^{\phi} + \mathbf{R}_M + \mathbf{R}_I + \mathbf{R}_S + \mathbf{r}'$$

The covariance matrix is then:

$$\begin{aligned} Cov(\mathbf{r}) &= Cov(\mathbf{R}_C^{\phi} + \mathbf{R}_M + \mathbf{R}_I + \mathbf{R}_S + \mathbf{r}') \\ &= Cov(\mathbf{R}_C^{\phi}) + Cov(\mathbf{R}_C^{\phi}, \mathbf{R}_M) + Cov(\mathbf{R}_C^{\phi}, \mathbf{R}_I) + Cov(\mathbf{R}_C^{\phi}, \mathbf{R}_S) + Cov(\mathbf{R}_C^{\phi}, \mathbf{r}') \\ &\quad + Cov(\mathbf{R}_M, \mathbf{R}_C^{\phi}) + Cov(\mathbf{R}_M) + Cov(\mathbf{R}_M, \mathbf{R}_I) + Cov(\mathbf{R}_M, \mathbf{R}_S) + Cov(\mathbf{R}_M, \mathbf{r}') \\ &\quad + Cov(\mathbf{R}_I, \mathbf{R}_C^{\phi}) + Cov(\mathbf{R}_I, \mathbf{R}_M) + Cov(\mathbf{R}_I) + Cov(\mathbf{R}_I, \mathbf{R}_S) + Cov(\mathbf{R}_I, \mathbf{r}') \\ &\quad + Cov(\mathbf{R}_S, \mathbf{R}_C^{\phi}) + Cov(\mathbf{R}_S, \mathbf{R}_M) + Cov(\mathbf{R}_S, \mathbf{R}_I) + Cov(\mathbf{R}_S) + Cov(\mathbf{R}_S, \mathbf{r}') \\ &\quad + Cov(\mathbf{r}', \mathbf{R}_C^{\phi}) + Cov(\mathbf{r}', \mathbf{R}_M) + Cov(\mathbf{r}', \mathbf{R}_I) + Cov(\mathbf{r}', \mathbf{R}_S) + Cov(\mathbf{r}') \end{aligned}$$

The covariance between  $r_i$  and  $r_j$  is:

$$\begin{aligned} Cov(r_i, r_j) &= Cov(R_{C(i)}^{\phi}, R_{C(j)}^{\phi}) + Cov(R_{C(i)}^{\phi}, R_{M(j)}) + Cov(R_{C(i)}^{\phi}, R'_{I(j)}) + Cov(R_{C(i)}^{\phi}, R'_{S(j)}) + Cov(R_{C(i)}^{\phi}, r'_j) \\ &\quad + Cov(R_{M(i)}, R_{C(j)}^{\phi}) + Cov(R_{M(i)}, R_{M(j)}) + Cov(R_{M(i)}, R'_{I(j)}) + Cov(R_{M(i)}, R'_{S(j)}) + Cov(R_{M(i)}, r'_j) \\ &\quad + Cov(R'_{I(i)}, R_{C(j)}^{\phi}) + Cov(R'_{I(i)}, R_{M(j)}) + Cov(R'_{I(i)}, R'_{I(j)}) + Cov(R'_{I(i)}, R'_{S(j)}) + Cov(R'_{I(i)}, r'_j) \\ &\quad + Cov(R'_{S(i)}, R_{C(j)}^{\phi}) + Cov(R'_{S(i)}, R_{M(j)}) + Cov(R'_{S(i)}, R'_{I(j)}) + Cov(R'_{S(i)}, R'_{S(j)}) + Cov(R'_{S(i)}, r'_j) \\ &\quad + Cov(r'_i, R_{C(j)}^{\phi}) + Cov(r'_i, R_{M(j)}) + Cov(r'_i, R'_{I(j)}) + Cov(r'_i, R'_{S(j)}) + Cov(r'_i, r'_j) \end{aligned}$$

The component parts of the covariance matrix are:

Pure Currency term:  $Cov(R_{C(i)}^{\phi}, R_{C(j)}^{\phi})$

Market cross terms:  $Cov(R_{C(i)}^{\phi}, R_{M(j)}) + Cov(R_{M(i)}, R_{C(j)}^{\phi})$

Pure Market term:  $Cov(R_{M(i)}, R_{M(j)})$

Industry cross terms:

$$Cov(R_{C(i)}^{\phi}, R'_{I(j)}) + Cov(R_{M(i)}, R'_{I(j)}) + Cov(R'_{I(i)}, R_{C(j)}^{\phi}) + Cov(R'_{I(i)}, R_{M(j)})$$

Pure Industry term:  $Cov(R'_{I(i)}, R'_{I(j)})$

Style cross terms:

$$\begin{aligned} &Cov(R_{C(i)}^{\phi}, R'_{S(j)}) + Cov(R_{M(i)}, R'_{S(j)}) + Cov(R'_{I(i)}, R'_{S(j)}) + Cov(R'_{S(i)}, R_{C(j)}^{\phi}) \\ &+ Cov(R'_{S(i)}, R_{M(j)}) + Cov(R'_{S(i)}, R'_{I(j)}) \end{aligned}$$

Pure Style term:  $Cov(R'_{S(i)}, R'_{S(j)})$

Equity cross terms:

$$\begin{aligned} &Cov(R_{C(i)}^{\phi}, r'_j) + Cov(R_{M(i)}, r'_j) + Cov(R'_{I(i)}, r'_j) + Cov(R'_{S(i)}, r'_j) + Cov(r'_i, R_{C(j)}^{\phi}) \\ &+ Cov(r'_i, R_{M(j)}) + Cov(r'_i, R'_{I(j)}) + Cov(r'_i, R'_{S(j)}) \end{aligned}$$

Pure Equity term:  $Cov(r'_i, r'_j)$

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