NORGES BANK

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Review of the management of the Government Pension Fund Global

The Ministry of Finance began carrying out broad reviews of Norges Bank's management of the Government Pension Fund Global (GPFG) in 2009. In the spring 2010 white paper on the fund, the Ministry announced that these reviews would be performed regularly at the start of each parliamentary term. As part of these reviews, the Ministry has obtained analyses and assessments from Norges Bank and external advisers. The next such review will be presented in the spring 2022 white paper on the fund. In this context, the Ministry asked Norges Bank in a letter of 15 June 2021 to provide analyses and assessments of the operational management of the GPFG.

Transparency is essential for confidence in the management of the fund. Norges Bank has always attached great importance to providing accurate, detailed and appropriate reporting on its management of the fund. The information we publish on the management of the fund has evolved accordingly over time. The management mandate sets out extensive requirements for public reporting. Since the first broad review of the management of the fund in 2009, the mandate has been expanded to include, among other things, requirements for reporting on strategy at the end of strategy periods and an annual performance assessment by the Executive Board. Each year, we publish a detailed report on responsible investment on top of our ordinary interim and annual reporting. We also make GIPS reports, data and other information available on our website. In its letter of 15 June, the Ministry writes that it has noted how Norges Bank has expanded its reporting on the fund considerably in recent years, and sees this as a positive contribution to transparency around the management of the fund. Our response in this letter is based largely on information that Norges Bank has already put in the public domain.

Norges Bank is of the opinion that the fund has been managed well. Norges Bank is satisfied that the return over time has been good and higher than the return on the benchmark index that the fund's performance is measured against. The Executive Board emphasises the importance of assessing the performance of the fund over time.

Viewed over the full period from 1998 to 30 September 2021, the annual return on the fund has been 6.49 percent, which is 0.26 percentage point higher than the annual return on the benchmark index the fund is measured against. After deductions for management costs and inflation, the annual net real return has been 4.52 percent over the same period. The annual return has been particularly strong over the past five years at 9.68 percent, which is 0.33 percentage point higher than for the benchmark. The annual net real return over this period has been 7.51 percent.

Norges Bank is satisfied that management costs are low compared to other managers. Transaction costs directly related to purchases and sales of securities are expensed directly in the portfolio result and are not included in management costs. We strive continuously to keep transaction costs down. Cost-effective management of the fund supports the objective of the highest possible return after costs.

The virus outbreak in 2020 brought new challenges for the management of the GPFG. At all times since the outbreak, Norges Bank has been able to carry out its management assignment in accordance with the Ministry's mandate and the Executive Board's established strategies. Employees have worked hard to manage the fund in a situation with partial closures of Norges Bank's offices in Norway and abroad. The Executive Board believes that a solid excess return in a turbulent period reflects an organisation that is operationally robust with sound IT solutions and flexible staff. The management organisation is well-equipped to deal with the opportunities and challenges the markets present.

Returns

In its letter of 15 June, the Ministry asks Norges Bank to assess the performance of the fund since 1998 and for various sub-periods. In this letter, we have chosen to focus on the full period and the past five years. The enclosures present return data for various periods.

The fund's annual return over the full period from 1998 to 30 September 2021 has been 6.49 percent, measured in the fund's currency basket.[1] The annual return for equity and fixed-income investments over the same period has been 6.85 and 4.57 percent respectively, again measured in the currency basket. This basket is a weighted combination of the currencies in the fund's benchmark index at any given time. The currency basket has changed considerably over time as a result of changes to the benchmark index. The results for different time periods cannot therefore be compared directly.

Net of management costs and inflation, the fund's annual return since 1998 has been 4.52 percent. The objective for the management of the fund is the highest possible return

[1] See Enclosure 1 for historical calculations of fund returns.

after costs. We maintain a high level of cost awareness in our management of the fund and work continually on streamlining our operations to realise economies of scale. This is one reason why management costs have gradually decreased over time in relation to assets under management. Another reason is that assets under management have increased. Over the past five years, annual management costs have come to 5 basis points of assets under management, compared to 8 basis points for the full period.[2] CEM Benchmarking Inc's annual reports for the Ministry of Finance comparing management costs with other large funds show that the GPFG's management costs since 2012 have been between 11 and 14 basis points lower than for the peer group. CEM Benchmarking states that this comparison takes account of differences in size and asset mix.

The fund's annual excess return since 1998 over the benchmark index the fund is measured against has been 0.26 percentage point. The aggregate excess return over the full period is equivalent to 208 billion Norwegian kroner. Equity investments have generated an annual excess return of 0.44 percentage point over the equity portion of the benchmark index, and fixed-income investments 0.17 percentage point over the fixed-income portion. The excess return for the overall portfolio is also positive when adjusted for risk and costs.[3]

<u>The past five years</u>
Over the past five years, the fund's annual return has been 9.68 percent, with a 12.74 percent return for equities and 2.83 percent for bonds. Net of costs and inflation, the annual return has been 7.51 percent. These five years have seen the strongest growth in the fund's history, with its market value increasing by no less than 4,555 billion kroner.[4] This strong return in recent years serves as a reminder that the fund's market value may fluctuate considerably in the future.

Since 2013, Norges Bank has grouped its management into three main strategies: asset management, security selection and fund allocation. For further information on these strategies, see Norges Bank's letter of 15 December 2017. The three strategies complement one another in that they have different time horizons, build on different analytical frameworks, and are expected to produce excess returns under different market conditions. We do not expect these strategies all to generate an excess return at any one time. The idea has been that together they will generate an excess return over time. On 7 April 2021, Norges Bank published a new strategy for the period 2021-2022. This is discussed in more detail later in this letter.

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[2] One reason for management costs being higher in relation to assets under management over the full period is that assets under management were much smaller in the early years.
[3] For further information, see Enclosure 2 and the annex to the 2020 annual report at www.nbim.no. See also the comparison with a passive indexing strategy later in this letter.
[4] Returns, exchange rates, inflows and outflows have changed its value by 4,523, 588, 80 and -635 billion kroner respectively.

Over the past five years, the fund's main strategies have delivered an annual excess return of 0.33 percentage point. Asset management and security selection have made a positive contribution to this excess return of 0.15 and 0.28 percentage point respectively, while fund allocation has made a negative contribution of 0.10 percentage point. The strategies' contributions to management costs are presented in Enclosure 3.

The relative return can also be broken down between management areas and between internal and external management. Over the past five years, equity management has contributed 0.30 percentage point to the annual excess return. Internal equity management has contributed 0.19 percentage point, and external equity management 0.11 percentage point. Internal equity management consists of asset positioning, securities lending, internal security selection and various allocation decisions. External equity management consists largely of security selection strategies. External management mandates are mainly awarded for emerging markets and small-cap companies in developed markets. External managers have deep understanding of companies and local market dynamics.

Over the past five years, fixed-income management has contributed 0.10 percentage point to the annual excess return. Fixed-income strategies within asset management and security selection have made positive contributions to the excess return for the period of 0.07 and 0.02 percentage point respectively, and fund allocation has contributed 0.01 percentage point.

The various investment strategies and mandates are funded with equities and bonds in the benchmark index set by the Ministry. The investment strategies and mandates are measured relative to this funding. Which equities and fixed-income instruments are used for this funding will depend on the strategy's characteristics and purpose. For example, the mandates within security selection specialise in specific sectors and markets, and so the funding of these mandates is designed to reflect the focus and scope of these mandates as closely as possible.

The sum of the funding for the fund allocation, security selection and asset management strategies will always be equal to the benchmark index set by the Ministry. This means that the aggregate relative return for the different strategies is equal to the difference between the overall portfolio and the benchmark index.

Value added through active management

The Ministry asks Norges Bank to provide an updated analysis of the value added through active management. Norges Bank believes that the management of the fund demands a high level of ambition. In the strategy for 2021-2022, we have expressed an ambition to be the world's best global investment fund. Our goal is to safeguard and build financial wealth for future generations through a skilled management organisation and responsible investment. Our management assignment is wide-ranging and complex. One important premise for the investment strategy is that the fund is to be managed close to the benchmark index. However, all of our investment strategies have active components.

A strategy without active components – a passive strategy – would attempt to mimic the benchmark index by following set rules. We are of the opinion that such a strategy is not compatible with the investment strategy set by the Ministry or with the overall objective of the highest possible return after costs.[5] If we compare the fund's excess return after management costs with the results that we could have achieved with a passive indexing strategy, we can obtain an estimate of the value added by managing the fund actively.

To estimate the results that could have been achieved with a passive strategy, we assume that it delivers the same return as the benchmark index while also generating revenue from securities lending. A passive strategy would also entail management costs.[6] The bulk of these costs would be related to purchases and sales of securities in connection with inflows into and withdrawals from the fund, changes to the investment strategy set by the Ministry, and changes resulting from index rules. There would also be staff costs and costs for various systems and data.[7]

For the period through to 31 December 2020, we find that the actual relative return after costs for the portfolio has been 24 basis points higher than the relative return on a passive indexing strategy after costs. The corresponding figure for the past five years is 15 basis points. The estimated difference between the fund's actual excess return after costs and a passive strategy is very close to the fund's excess return before costs. Norges Bank is therefore of the opinion that the excess return before costs is a good approximation of the value added through active management.

The Ministry raises the issue of whether the substantial growth in the fund's assets has affected the potential for excess returns. In its letter of 15 December 2017, Norges Bank wrote that higher assets under management make it harder to achieve an excess return in percentage terms. We still believe this to be the case, even though the realised excess return over the past five years has been good.

Risk

The fund's expected absolute volatility, calculated as standard deviation based on a three-year price history, estimates how much the annual return on the fund's investments can normally be expected to fluctuate. As at 30 September 2021, the fund's annual

[5] For example, investments in unlisted real estate and unlisted renewable energy infrastructure will not be compatible with a passive strategy.

[6] The expert group evaluating the management of the fund in 2017 found that parts of the GPFG's management costs would also have been incurred had the fund been managed passively. For further information, see "A Review of Norges Bank's Active Management of the Government Pension Fund Global" by Magnus Dahlquist and Bernt Arne Ødegaard, 5 January 2018.

[7] See Enclosure 4 for details. Calculations as at 31 September 2020.

absolute volatility was 10.39 percent, measured in kroner.[8] Equity investments had an annual absolute volatility of 14.54 percent, fixed-income investments 9.80 percent, and unlisted real estate investments 11.03 percent.

The fund's investments are managed within a limit for expected relative volatility (tracking error) of 1.25 percentage points. This limit aims to regulate the size of expected deviations between the return on the benchmark index and the portfolio under normal market conditions. The limit for expected relative volatility has been adjusted several times and has also covered the fund's unlisted investments since January 2017. We calculate expected relative volatility using a three-year price history.

As at 30 September 2021, expected relative volatility for the portfolio as a whole was 50 basis points. This is 17 basis points higher than at the time of the previous review of the Bank's active management in 2017. Much of the increase can be attributed to high volatility in financial markets in connection with the coronavirus pandemic. In addition, listed real estate stocks had one of their worst weeks ever in March 2020. As daily pricing is not available for the fund's unlisted real estate investments, we use a model from MSCI to calculate the expected relative volatility for these investments. The model is based partly on price movements for listed real estate stocks. The slide in prices for listed real estate stocks helped push up the fund's relative volatility from 33 basis points at the beginning of 2020 to 49 basis points on 19 March 2020. Because the calculations are based on a three-year history, this extreme event will affect the calculation of relative volatility for some time.

As at 30 September 2021, the fund's overall expected relative volatility was lower (50 basis points) than for the sum of the three main strategies for the management of the fund (a total of 75 basis points). This reflects the way the different strategies diversify the fund's overall relative risk. We aim to strike a good balance between risks in the different strategies in order to exploit these diversification effects. When market conditions change, opportunities to capitalise on the fund's strengths may mean that we decide to increase the weight of one or more strategies. This can also impact on the diversification effect.

The management mandate requires the Executive Board to set a supplementary risk limit for large negative deviations from the benchmark index that are expected to occur rarely, referred to as extreme deviation risk. This limit takes the form of a limit for expected shortfall, which is defined as the average of the deviations that can be expected beyond a given probability and therefore includes all observations in the left-hand tail of the probability distribution. To ensure that Norges Bank's limit for extreme deviation risk complements the mandate's limit on relative volatility, we estimate expected shortfall

[8] See Enclosure 5 for historical calculations of the fund's risk.

over a long time period. The calculation window begins in 2007 and widens continuously from this point.

As at 30 September 2021, the expected shortfall with a 97.5 percent confidence interval (i.e. the average deviation in the 2.5 percent weakest observations) was estimated at 151 basis points annually. The Executive Board has set a limit for expected shortfall of 375 basis points.

In its letter of 15 June, the Ministry asks Norges Bank to explain how the risks associated with exposure to systematic risk factors are addressed in the management of the fund. Risk factors capture common variations in returns on securities with similar characteristics, such as small-cap stocks. Exposure to these factors can be estimated using the correlation between the fund's historical relative return and the return on these factors. The results of such statistical regressions are uncertain, and we also use several other approaches to analyse the fund's factor exposures. We measure and report on the fund's aggregate exposure to systematic risk factors on a regular basis.[9] We also monitor the portfolio's implicit exposure to a broad set of risk factors. This is an important part of Norges Bank's risk management.

Section 2-4 (7) of the management mandate requires the equity and bond portfolio to be composed in such a way that the expected excess return is exposed to a number of systematic risk factors. Since 2012, the Bank has had a strategic allocation to systematic risk factors such as value, size and quality. Our strategy for 2021-2022 includes a reduction in this direct allocation to systematic risk factors. As required by the management mandate, the strategy was submitted to the Ministry three weeks before it was adopted. We view the mandate provision on systematic risk factors not as a requirement for the portfolio to have explicit exposure to risk factors, but rather as a requirement for good risk management in the active management of the fund.

Norges Bank's work on risk management is extensive, and the mandate contains more requirements for reporting on risk than when that provision on systematic risk factors was introduced. We are of the opinion that this provision is redundant and should be removed from the mandate.

Real estate management

When the Ministry first opened the door for up to 5 percent of the GPFG to be invested in unlisted real estate in Report to the Storting No. 16 (2007-2008), it stressed that the fund was to be a highly diversified and global portfolio and should therefore also be exposed to a large asset class such as real estate. The Ministry also stressed that investments in real estate could help improve the diversification of risk, and that the fund's special characteristics made it well-suited to bearing the risk associated with investments of this

[9] See annual reports at www.nbim.no.

kind. The build-up of the real estate portfolio would be matched by a reduction in the fund's fixed-income investments.

The set-up for the fund's unlisted real estate investments was modified in 2017. Rather than having a set strategic allocation in the management mandate, the overall decision on such investments was delegated to Norges Bank. At the same time, the limit for the fund's unlisted real estate investments was raised to 7 percent. Today, Norges Bank decides whether the fund should be invested in real estate, to what extent, and in what type of investments. To fund these real estate investments, Norges Bank sells equities and bonds.

The fund's real estate investments consist of both listed and unlisted assets. Norges Bank's goal is for up to 5 percent of the fund to be invested in a portfolio of real estate managed under a combined strategy. This strategy is to be flexible so that we can take advantage of opportunities arising as a result of changes in the markets for unlisted and listed real estate. As at 30 September 2021, 4.45 percent of the fund was invested in real estate, breaking down into 2.50 and 1.95 percent in unlisted and listed real estate respectively.

Norges Bank has built up a broad real estate portfolio with the emphasis on four sectors: offices, retail, logistics and residential. Our investments in residential properties are generally through listed real estate vehicles, while our investments in logistics are mainly through unlisted vehicles. Our unlisted real estate investments are concentrated in New York, Boston, Washington, San Francisco, London, Paris, Berlin and Tokyo. Given our business model, however, our logistics investments are spread across more countries.

In 2014, the management of the fund's unlisted real estate investments was organised as a separate unit (NBREM) with its own leader group. In 2019, NBIM and NBREM were merged. This was decided at the Executive Board's meeting of 6 February 2019. With a limited real estate portfolio and an increased desire for a combined approach to listed and unlisted real estate, the Board no longer considered it appropriate to have a separate organisation for unlisted real estate.[10]

<u>Returns</u>

In its letter of 15 June, the Ministry asks Norges Bank Bank to analyse and assess how real estate investments, both as a whole and broken down into listed and unlisted investments, have performed relative to relevant benchmarks. Norges Bank is also asked to explain how any internal benchmarks used are defined.

From the first investment in 2011 to 30 September 2021, the annual return on the fund's total real estate investments has been 5.74 percent, measured in the fund's currency

[10] For further information, see Norges Bank's letter of 7 February 2019.

basket. Since the change in the setup for the fund's unlisted real estate investments in 2017, the annual return has been 5.65 percent. The instruments Norges Bank sold to fund these investments generated an annual return of 7.18 percent over the same period. Real estate investments have made a negative contribution of 7 basis points annually to the fund's relative return since 2017.

The annual return on unlisted real estate since 2017 has been 6.32 percent. The instruments Norges Bank sold to fund these investments have returned 6.29 percent. The return on the fund's unlisted real estate investments depends on rental income, operating costs, changes in the value of properties and debt, movements in exchange rates, and transaction costs for property purchases and sales. Measured in local currency, rental income net of operating costs has contributed 3.57 percentage points of the return since 2017.[11] Changes in the value of our properties over the same period have contributed 2.67 percentage points.[12] Transaction costs have made a negative contribution of 0.13 percentage point, and exchange rate movements a positive contribution of 0.14 percentage point. Exchange rate movements affect the return on the real estate portfolio because the portfolio has a different currency composition to the fund's currency basket.

The return on unlisted real estate investments can also be compared with MSCI's IPD Global Property Index. This is an index that reflects returns at the property level. When we report the return on our unlisted real estate investments, we include income statement and balance sheet items that are not directly related to the properties, such as taxes, management fees and interest costs. In order to compare the unlisted real estate portfolio with the IPD index, we calculate returns at the property level. It is important to note that these calculations exclude transaction costs, whereas the IPD index includes these costs. The reason why we have excluded transaction costs is that they have a much greater impact on returns during a build-up phase than in an established portfolio. MSCI estimates transaction costs in its index at 0.2 percent annually.

Since we made our first unlisted real estate investment in 2011, the IPD index has produced an annual return of 7.42 percent.[13] The return on the fund's unlisted real estate investments measured at the property level has been 7.25 percent over the same period. During the start-up phase, Norges Bank's real estate portfolio was very different from the composition of the IPD index. If we adjust for sectoral and geographical differences, the IPD index generated an annual return of 7.33 percent. Over the past five years, the annual return has been 6.20 percent for the adjusted IPD index and 5.88 percent for the fund's unlisted real estate portfolio measured at the property level.

[11] Operating costs consist of interest on external debt, taxes, fixed management fees, costs at management companies and costs in the holding structure.
[12] Value changes consist of realised gains and losses, changes in the value of properties, external debt and other assets, and variable management fees.
[13] The return series at the property level ends on 31 December 2020.

Since 2017, the annual return on the fund's listed real estate investments has been 4.08 percent. The instruments Norges Bank sold to fund these investments have returned 9.47 percent. 2020 was a particularly challenging year for listed real estate, with this asset class having one of its weakest weeks ever in March that year. Listed real estate is less resource-intensive and can be managed at lower cost than unlisted real estate. In the long term, we expect listed and unlisted real estate to have similar return and risk characteristics, as they expose the fund to the same underlying economic factors.

Norges Bank is asked to analyse how real estate investments, both as a whole and broken down into listed and unlisted investments, affect the fund's overall return and risk. To assess the effect of investing in real estate, we can look at a hypothetical portfolio where the fund's real estate investments are substituted with the instruments the Bank sold to fund these investments. Due to limited liquidity, high transaction costs and appraisal smoothing for unlisted real estate, there is an argument that an evaluation of the diversification effect of the fund's real estate investments should be based on long-term return data. Unlisted real estate prices are updated quarterly, and using such data over a relatively short history introduces considerable statistical uncertainty.

With these limitations in mind, the fund has had approximately the same return and slightly lower volatility since 2011 compared to a hypothetical fund without real estate.[14] Over the same period, the trade-off between return and risk in the fund has been marginally better than for a hypothetical fund with no real estate. This is mainly a result of the fund's unlisted real estate investments being less volatile than the instruments Norges Bank sold to fund them.

Real estate investments are currently measured mainly against the instruments Norges Bank sold to fund them. We strive constantly to improve our funding model for real estate investments. We are currently working on adjusting the ratio of equities and bonds that are sold to fund a real estate investment so as to reflect the individual property's risk characteristics. Factors that will typically be assessed are investment type, sector, age and quality, micro-location and lease status.

Environment-related mandates and fiscal strength

The management mandate contains a number of provisions on how Norges Bank is to construct the portfolio that are not reflected in the benchmark index. These include the requirement for Norges Bank to establish environment-related investment mandates and the requirement to take differences in fiscal strength between countries into account in the composition of the government bond portfolio.

[14] See Enclosure 6.

The design of these two mandate provisions is not entirely analogous, however. For example, the mandate sets a range for the size of the environment-related mandates and sets out which types of eco-friendly activities these investments are to focus on. There is not a corresponding specification of scope or emphasis in the provision on fiscal strength.

In the light of experience from the financial crisis, the Ministry began work in 2010 on assessing the return and risk characteristics of different parts of the bond market. As a result of this work, the Ministry presented a new benchmark index for bonds in Report to the Storting No. 17 (2011-2012). One priority in the work on the new bond index was clarifying the purpose of the different parts of the bond portfolio, including that the fund's investments in government bonds are intended to reduce fluctuations in the fund's total return over time. Fiscal strength was a highly topical issue at the time, with many countries in Europe running high levels of debt and persistent budget deficits.

The Ministry made several changes to the bond index. One was to replace market weights for government bonds in the benchmark index with GDP weights. The Ministry also added a mandate requirement that Norges Bank must seek to take differences in fiscal strength into account in the composition of the government bond portfolio. The adjustments most suited to taking account of fiscal strength will change over time.[15] The Ministry and Norges Bank agreed that adjustments of this type would best be done as part of the operational management of the fund.

In Report to the Storting No. 17 (2011-2012), the Ministry elaborated that the mandate provision on fiscal strength was intended to clarify that one of the aims of the fund's investments in government bonds is to reduce fluctuations in the fund's overall return over time. The mandate requirement came into effect on 31 May 2012. The provision is currently implemented for government bonds issued in euros through the use of special country factors. Countries with weak government finances are given a lower weight in the portfolio than those with stronger government finances. Interest rate differentials between countries with strong and weak government finances mean that the position will have a negative expected return under normal market conditions.

Our experience of the position is that its impact on actual fluctuations in the fund's return during the period has been minor. At the same time, these positions have brought a cost in the form of a negative excess return relative to the fund's benchmark index.

Since 2012, the management mandate has included a requirement for the Executive Board to approve in advance all financial instruments that are to be used in the management of the fund, and all markets in which investments are to be made. In the case of investments in government bonds, the Executive Board is to approve all issuing

[15] Enclosure 7 shows how the portfolio's exposure to fiscal strength has moved over time.

countries. Against this background, the Executive Board has established procedures for regular reviews of which issuing countries are to be approved. A government's ability to service its debt forms part of this assessment. Norges Bank therefore believes that the current provision is redundant and should be removed from the mandate.

Should the Ministry decide to retain the provision on fiscal strength, we will interpret it as a requirement for country-approval and for risk management in the fund rather than a requirement for the portfolio to deviate from the benchmark index set by the Ministry.

Results

In its letter of 15 June, the Ministry asks Norges Bank to present experience of the mandate provisions on fiscal strength and environment-related investments, including their contributions to relative return and management costs, the limit on expected relative volatility, and expected extreme deviation risk.[16]

The position following the provision on fiscal strength has made a negative contribution of 8.5 billion kroner to the fund's excess return. This corresponds to -2 basis points annualised. As at 30 September 2021, expected relative volatility due to the provision on fiscal strength was an estimated 4 basis points at the fund level. Expected shortfall at the same date was an estimated 15 basis points annually. Norges Bank uses some resources to monitor the position. Otherwise, management costs are the same as for the rest of fixed-income management.

In the National Budget for 2010, the Ministry decided that environment-related mandates should be established within the investment universe at that time. In 2012, a range for these mandates was set at between 20 and 30 billion Norwegian kroner. This range has been adjusted several times since and currently stands at between 30 and 120 billion Norwegian kroner. In 2019, the Ministry decided that the fund could invest in unlisted renewable energy infrastructure within the framework for the environment-related mandates. As at 30 September 2021, the market value of the environment-related mandates was 109 billion kroner, breaking down into 95 billion kroner in equities and 14 billion kroner in unlisted renewable energy infrastructure.

Since 2010, the environment-related equity mandates have made a positive contribution of 27.8 billion kroner to the fund's excess return. This corresponds to 3 basis points annualised. As at 30 September 2021, expected relative volatility due to the environment-related mandates was an estimated 7 basis points at the fund level. Expected shortfall at the same date was an estimated 17 basis points annually for the environment-related mandates. Management costs for the environment-related equity mandates are the same in relation to assets under management as for internal equity selection. Management costs related to unlisted renewable energy infrastructure are

[16] See Enclosure 7.

expected to be around the same in relation to assets under management as for the fund's unlisted real estate investments.[17]

Investment strategies

The Ministry notes in its letter of 15 June that Norges Bank has updated its strategy for Norges Bank Investment Management for the period 2021-2022. In this context, the Ministry asks the Bank to provide information on the emphasis and other aspects of its investment strategies going forward.

The Ministry has developed an investment strategy for the fund over time with the following key features:

- Diversification of investments
- Harvesting of risk premiums
- Rebalancing of equity share
- Limited scope for deviation from benchmark index (active management)
- Responsible investment
- Cost-effective management
- Transparency

In line with the provisions of the management mandate, the Executive Board has adopted a plan for how the fund is to be managed. This strategic plan sets out the Executive Board's overall goals for the management of the fund and covers investment strategies, risk management, systems and organisation. The strategy for 2021-2022 builds on the Ministry's investment strategy and Norges Bank's previous strategic plan.

In the strategy for 2021-2022, we state that we will prioritise specific, delegated active strategies in equity and fixed-income management, and place less emphasis on overall allocation between asset classes, countries and regions. We therefore plan to reduce the allocation to systematic risk factors and exposure to segments outside the benchmark index. The exceptions are our strategic allocations to real estate, unlisted renewable energy infrastructure and emerging market debt. As a result of this strategic change, the reference portfolio set up to facilitate overall allocation decisions will no longer be a separate part of Norges Bank's investment process.

The Ministry asks Norges Bank for information on the expected contribution to the fund's risk and return from the different investment strategies. We use a variety of strategies to manage the fund with acceptable risk and within the constraints imposed by the management mandate. The strategies are tailored to the fund's risk tolerance and our unique characteristics as a large, long-term investor with limited short-term liquidity needs and low management costs. As in previous strategy periods, the strategies are intended to be complementary. They have different time horizons, build on different

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[17] For further information, see Norges Bank's letter of 29 October 2018.

analytical frameworks, and are expected to produce excess returns under different market conditions. Variations in market conditions might take the form of higher or lower liquidity, more or less appetite for risk, or various cyclical patterns. We have to expect the individual strategies to contribute positively in some periods and negatively in others. The idea is that together they generate an excess return over time.

Norges Bank will further integrate environmental, social and governance issues into the investment process. In the 2021 white paper on the fund, the Ministry stresses the importance of being a responsible investor in markets with elevated risks, including social and environmental risks. We have expanded our system for reviewing sustainability risks at companies added to the index we track. This will enable us to consider environmental and social issues at these companies at an earlier stage. This means that Norges Bank may choose not to invest in some companies even if they are included in the index the Bank is measured against. The decision to perform risk assessments ahead of a company being included in the index is a natural extension of Norges Bank's responsible management of the fund. As with risk-based divestments, this will form part of our active management of the fund, where Norges Bank does not publish the rationale for individual decisions.

Equities and fixed income
Norges Bank's investment strategies for equities and fixed income rest on two pillars: efficient market exposure and fundamental research. We will continue to develop our investment strategies with a view to achieving the highest possible return after costs.

Our market exposure strategies are about achieving the desired market and risk exposure as cost-effectively as possible. This includes managing the broad equity and fixed-income portfolios, executing securities trades, and managing cash, currencies and securities lending. We try to avoid making purchases and sales that coincide with changes to the indices from FTSE Russell and Bloomberg. In the coming years, we will improve our portfolio construction and trading strategies to further reduce turnover and transaction costs in the management of the fund's equity exposure. In the strategy for 2021-2022, we write that we plan to increase our active positioning around corporate actions and capital market events. We will continue to lend our equities responsibly, and we will expand our direct lending activities to diversify our exposure and increase our income from securities lending.

Our fundamental research strategies is about investing in companies based on company analysis. The aim is to generate an excess return and provide a sound basis for our work on responsible investment. Our company investments are managed both internally and externally.

Internal strategies for company investments focus primarily on large- and mid-cap companies in Europe and America. As a large, long-term investor, we have unique access to individual companies. Combined with thorough internal analysis, this contributes to the goal of the highest possible return after costs. We have set a target of expanding our internal coverage to 1,000 companies. Based on our own research, we will expand our strategies for negative selection by underweighting stocks we expect to underperform the market. We will do this through forensic accounting analysis of selected companies.

External management mandates are mainly awarded for emerging markets and small-cap companies in developed markets. The fund has a competitive advantage in the form of the expertise we have built up over the past 20 years in selecting external managers. We aim to scale up external management in selected market segments. External managers have deep understanding of companies and local market dynamics. This contributes to our goal of a high return, while also reducing risk.

The fund's fixed-income investments are divided into 70 percent government and government-related bonds and 30 percent corporate bonds. A high proportion of our fixed-income investments are in developed markets. However, we will invest up to 5 percent of our bond portfolio in selected government issuers in emerging markets, and actively manage the associated currency risk. The fund invests not only in bonds issued by companies but also in covered bonds, which are issued by banks and backed by a portfolio of mortgages. Corporate bonds normally produce higher returns than government bonds. We will invest our corporate bond portfolio based on thorough company research, leveraging company knowledge across equities and fixed income. We will actively expose the fund to attractive liquidity premia in order to exploit the fund's special characteristics.

Real estate and unlisted renewable energy infrastructure

Real estate investments are the fund's third-largest asset class. Norges Bank makes these investments to bring greater diversification to the fund than would follow from the benchmark index. The fund's size, long investment horizon and capacity to hold illiquid assets are special characteristics that may be an advantage in large real estate transactions. Norges Bank's target is for up to 5 percent of the fund to be invested in real estate, made up of listed and unlisted assets managed under a combined strategy. This strategy is to be flexible so that we can take advantage of opportunities arising as a result of changes in the markets.

The fund's mandate was amended in 2019 to include investments in renewable energy infrastructure. This strategy supplements our existing portfolio of unlisted real estate, and we will draw on our experience of unlisted investments. We will gradually build up the renewable energy portfolio, investing mainly in wind and solar power. We will consider projects with reduced power price risk, stable cash flows and limited risk to the principal investment.

It is reasonable to assume that investments in unlisted infrastructure will contribute a stable, inflation-adjusted income over a long period and better diversification of risk for the fund as a whole. The fund's investments in unlisted infrastructure need to be assessed over a long period. We made our first investment in this asset class in 2021 and so it is not a natural part of this historical evaluation.

Assessment of risk limit

The Ministry asks Norges Bank to assess whether the size of the limit for deviation from the benchmark index, expressed as expected relative volatility (tracking error), is well-suited to the management of the fund.

We need to assume that measured risk in financial markets could increase. In addition, we are in a period when the fund's investments in unlisted renewable energy infrastructure are being built up. Unlisted investments increase expected relative volatility relatively more than other investment strategies. This is because deviations between asset classes increase the fund's expected relative volatility more than deviations within asset classes. The expected build-up of investments in unlisted renewable energy infrastructure will count towards the limit for expected relative volatility.

Investments in unlisted markets are more challenging to manage within a limit for relative volatility. For example, as mentioned earlier, the fund's relative volatility increased markedly in March 2020. This was partly a result of how we calculate expected relative volatility for the fund's unlisted real estate investments. If the share of unlisted investments increases in the future, this may exacerbate these challenges. This could be an argument for a slightly higher limit in the longer term, so that Norges Bank has scope to make other adjustments in periods where the increase in relative volatility is not a result of changes in the fund's underlying relative positioning.

The calculation of expected relative volatility also presents some other challenges. It is calculated using statistical models based on a number of assumptions, and not all of these assumptions are equally realistic. The models often assume that historical market fluctuations and covariances provide a good indication of future market developments. This may mean that risk is systematically overestimated in periods of high volatility, and underestimated in periods of low volatility. This could result in a procyclical bias in the investment strategy and limit Norges Bank's ability to capitalise on its long-term investment horizon. A slightly higher limit could put us in a better position to take advantage of the fund's special characteristics, especially in periods of very high market volatility.

We believe that, at present, the limit for expected relative volatility is adequate. Norges Bank may, however, revisit this issue at a later date. Such an assessment might consider alternatives to raising the limit for expected relative volatility. One alternative would be for unlisted investments to be excluded from the calculation of relative volatility.

Yours faithfully

Øystein Olsen

Nicolai Tangen

Enclosures

Enclosures

Enclosure 1: Returns

Table 1: Absolute return by asset class

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Return on equity investments	6.85	7.54	12.97	12.74
Return on fixed-income investments	4.57	4.04	3.55	2.83
Return on unlisted real estate investments	6.04		6.88	6.26
Return on unlisted renewable infrastructure investments	-2.15			
Return on fund	6.49	6.77	9.68	9.68

Note: Measured in the fund's currency basket. Annualised, percent. As at 30 September 2021. Equity investments from 1 January 1999. Unlisted real estate investments include listed real estate from 1 November 2014 to 31 December 2016. Unlisted infrastructure investments from 1 June 2021.

Table 2: Absolute return by management area

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Return on equity management	6.89	7.59	13.04	12.89
Return on fixed-income management	4.57	4.04	3.55	2.83
Return on real estate management	5.74		6.56	5.62
Return on unlisted renewable infrastructure management	-2.15			
Return on fund	6.49	6.77	9.68	9.68

Note: Measured in the fund's currency basket. Annualised, percent. As at 30 September 2021. Equity investments from 1 January 1999. Real estate management from 1 April 2011 and including listed real estate investments from 1 November 2014. Unlisted infrastructure investments from 1 June 2021.

Table 3: Absolute real return, fund

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Fund return (nominal)	6.49	6.77	9.68	9.68
Annual inflation	1.81	1.84	1.64	1.97
Annual management fees	0.08	0.07	0.06	0.05
Net real return	4.52	4.77	7.86	7.51

Note: Measured in the fund's currency basket. Annualised, percent. As at 30 September 2021.

Table 4: Relative return, fund

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Return on fund (percent)	6.49	6.77	9.68	9.68
Return on fund benchmark (percent)	6.23	6.63	9.44	9.35
Relative return on fund (percentage points)	0.26	0.14	0.24	0.33

Note: Measured in the fund's currency basket. Equity investments from 1 January 1999. Fund return includes real estate management from 1 January 2017. Relative return before 2017 includes only equity and fixed-income management. Annualised. As at 30 September 2021.

Table 5: Relative return, equity investments

	Since 01.01.1999	Last 15 years	Last 10 years	Last 5 years
Return on equity investments (percent)	6.85	7.54	12.97	12.74
Return on equity benchmark (percent)	6.41	7.27	12.65	12.45
Relative return on equity investments (percentage points)	0.44	0.27	0.31	0.29

Note: Measured in the fund’s currency basket. Includes listed real estate stocks. Annualised. As at 30 September 2021.

Table 6: Relative return, equity management

	Since 01.01.1999	Last 15 years	Last 10 years	Last 5 years
Return on equity management (percent)	6.89	7.59	13.04	12.89
Return on equity benchmark (percent)	6.41	7.27	12.65	12.44
Relative return on equity management (percentage points)	0.48	0.32	0.39	0.45

Note: Measured in the fund’s currency basket. Excludes listed real estate stocks. Annualised. As at 30 September 2021.

Table 7: Relative return, fixed-income investments

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Return on fixed-income investments (percent)	4.57	4.04	3.55	2.83
Return on fixed-income benchmark (percent)	4.40	3.93	3.50	2.49
Relative return on fixed-income investments (percentage points)	0.17	0.11	0.05	0.34

Note: Measured in the fund’s currency basket. Annualised. As at 30 September 2021.

Table 8: Relative return, fixed-income management

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Return on fixed-income management (percent)	4.57	4.04	3.55	2.83
Return on fixed-income benchmark (percent)	4.41	3.94	3.51	2.52
Relative return on fixed-income management (percentage points)	0.16	0.10	0.04	0.31

Note: Measured in the fund’s currency basket. Annualised. As at 30 September 2021.

Table 9: Investment strategies' contribution to fund's relative return, past five years

	Equity management	Fixed-income managment	Real assets management	Allocation	Total
Asset management	**0.07**	**0.07**		**0.01**	**0.15**
Asset positioning	0.05	0.06		0.01	0.12
Security lending	0.04	0.01			0.05
Security selection	**0.26**	**0.02**			**0.28**
Internal security selection	0.15	0.02			0.17
External security selection	0.11				0.11
Allocation	**-0.04**	**0.01**	**-0.07**	**-0.01**	**-0.10**
Systematic factors	-0.05				-0.05
Real estate			-0.07		-0.07
Unlisted real estate			0.00		0.00
Listed real estate			-0.07		-0.07
Environmental related mandates	0.05	0.00	0.00		0.05
Allocation	-0.03	0.01	0.00	-0.01	-0.03
Total	**0.30**	**0.10**	**-0.07**	**0.00**	**0.33**

Note: Annualised, percentage points. As at 30 September 2021.

Table 10: Investment strategies' contribution to fund's relative return, 2013 to 2021

	Equity management	Fixed-income managment	Real assets management	Allocation	Total
Asset management	**0.11**	**0.07**		**0.00**	**0.19**
Asset positioning	0.07	0.07		0.00	0.14
Security lending	0.05	0.01			0.05
Security selection	**0.18**	**0.01**			**0.19**
Internal security selection	0.07	0.01			0.08
External security selection	0.11				0.11
Allocation	**-0.04**	**-0.07**	**-0.04**	**0.02**	**-0.13**
Systematic factors	-0.03				-0.03
Real estate			-0.04		-0.04
Unlisted real estate			0.00		0.00
Listed real estate			-0.04		-0.04
Environmental related mandates	0.03	0.00	0.00		0.03
Allocation	-0.03	-0.07	0.00	0.02	-0.09
Total	**0.25**	**0.02**	**-0.04**	**0.02**	**0.24**

Note: Annualised, percentage points. As at 30 September 2021.

Enclosure 2: Risk adjustments

Table 1: Risk-adjusted return

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Fund				
Information ratio	0.42	0.23	0.66	0.98
Jensen's alpha (percent)	0.09	-0.09	0.12	0.24
Appraisal ratio	0.16	-0.14	0.36	0.77
Sharpe ratio difference	0.01	-0.01	0.01	0.02
Equity management				
Information ratio	0.68	0.56	0.90	1.14
Jensen's alpha (percent)	0.38	0.19	0.18	0.26
Appraisal ratio	0.57	0.35	0.48	0.80
Sharpe ratio difference	0.03	0.01	0.01	0.02
Fixed-income management				
Information ratio	0.16	0.09	0.07	0.94
Jensen's alpha (percent)	0.17	0.13	0.20	0.34
Appraisal ratio	0.18	0.11	0.57	1.11
Sharpe ratio difference	0.02	-0.01	0.06	0.10

Note: Before management costs. Annualised. As at 30 September 2021. Equity management from 1 January 1999. Fund return includes real estate management from 1 January 2017. Risk-adjusted performance measures for the fund before 2017 include only equity and fixed-income management.

Table 2: Equity investments – regression of relative return

		Regression coefficients					
Sample period	Intercept, bps annualised	Market	Small vs large	Cheap vs expensive	Profitable vs unprofitable	Conservative vs aggressive Investment	Variance explained in percent
Since 01.01.1999	**35**	**0.01**	**0.04**	0.00	0.00	**-0.03**	43
Last 15 years	**29**	**0.01**	**0.03**	0.01	-0.01	**-0.05**	43
Last 10 years	**29**	**0.01**	**0.02**	0.01	-0.01	**-0.03**	37
Last 5 years	**37**	**0.01**	**0.03**	0.01	0.00	-0.02	50

Note: Relative return measured in US dollars before management costs. As at 30 September 2021. Bold type indicates significance at the 5 percent level.

Table 3: Fixed-income investments – regression of relative return

		Regression coefficients		
Sample period	Intercept, bps annualised	Default	Term	Variance explained in percent
Since 01.01.1999	12	**0.06**	-0.02	21
Last 15 years	2	**0.07**	-0.02	26
Last 10 years	15	0.00	**-0.03**	25
Last 5 years	**30**	0.00	**-0.02**	13

Note: Relative return measured in US dollars before management costs. As at 30 September 2021. Bold type indicates significance at the 5 percent level.

Table 4: Equity and fixed-income investments – regression of relative return

Sample period	Intercept, bps annualised	Regression coefficients: Market	Small vs large	Cheap vs expensive	Profitable vs unprofitable	Conservative vs aggressive Investment	Default	Term	Variance explained in percent
Since 01.01.1999	14	**0.01**	**0.03**	**0.01**	0.01	**-0.03**	**0.02**	**-0.01**	48
Last 15 years	11	**0.01**	**0.03**	**0.02**	0.00	**-0.05**	**0.02**	**-0.01**	55
Last 10 years	**27**	**0.01**	**0.02**	0.00	0.00	0.00	0.00	-0.02	44
Last 5 years	**39**	0.00	**0.03**	0.01	0.01	0.00	0.00	-0.01	53

Note: Relative return measured in US dollars before management costs. As at 30 September 2021. Bold type indicates significance at the 5 percent level.

Enclosure 3: Costs

Table 1: Management costs by investment strategy, 2020

	Contribution to the fund's management costs	Management costs based on assets under management
Allocation	0.5	
of which unlisted real estate	0.3	10.7
Security selection	2.7	14.4
Internal security selection	0.7	4.6
External security selection	2.0	50.9
Asset management	1.9	2.5
Total	5.1	

Note: Costs reimbursed by Ministry of Finance. Basis points. External security selection includes all externally managed capital.

Table 2: Management costs by investment strategy, 2013 to 2020

	Contribution to the fund's management costs	Management costs based on assets under management
Allocation	0.3	
Security selection	2.6	15.5
Internal security selection	0.7	5.7
External security selection	1.8	44.8
Asset management	2.2	2.9
Unlisted real estate	0.4	21.5
Total	5.6	

Note: Costs reimbursed by Ministry of Finance. Basis points. External security selection includes all externally managed capital. Unlisted real estate part of allocation strategy from 2017.

Enclosure 4: Value added through active management

Table 1: Estimated return of a passive strategy

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Management costs of a passive strategy	-0.04	-0.04	-0.03	-0.03
Transaction costs related to replication of the benchmark index	-0.04	-0.03	-0.03	-0.02
Transaction costs related to inflows and extraordinary benchmark changes	-0.04	-0.05	-0.02	-0.01
Revenues from securities lending	0.05	0.06	0.05	0.04
Estimated relative return of a passive strategy	-0.07	-0.06	-0.03	-0.02

Note: Calculation assumes a passive strategy delivers the same return as the benchmark index. Annualised, percentage points. As at 31 December 2020.

Table 2: Relative return after costs

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Teh fund's relative return before management costs	0.25	0.10	0.16	0.19
The fund's management costs	0.08	0.07	0.06	0.05
The fund's relative return after management costs	0.17	0.03	0.11	0.14

Note: Annualised, percentage points. As at 31 December 2020. Management costs do not include costs relating to unlisted real estate before 2017.

Table 3: Comparison of fund's relative return after costs and estimated return of a passive strategy

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
The fund's relative return after management costs	0.17	0.03	0.11	0.14
Estimated relative return of a passive strategy	-0.07	-0.06	-0.03	-0.02
Estimated relative return difference	0.24	0.09	0.14	0.15

Note: Annualised, percentage points. As at 31 December 2020.

Enclosure 5: Risk

Table 1: Expected volatility

	Expected volatility
Equity investments	14.54
Fixed-income investments	9.80
Unlisted real estate investments	11.03
Renewable infrastructure investments	11.53
Fund	10.39

Note: Return in Norwegian kroner. Percent. As at 30 September 2021.

Table 2: Expected relative volatility

	Expected relative volatility
Equity investments	51
Fixed-income investments	65
Unlisted real estate investments	939
Fund	50

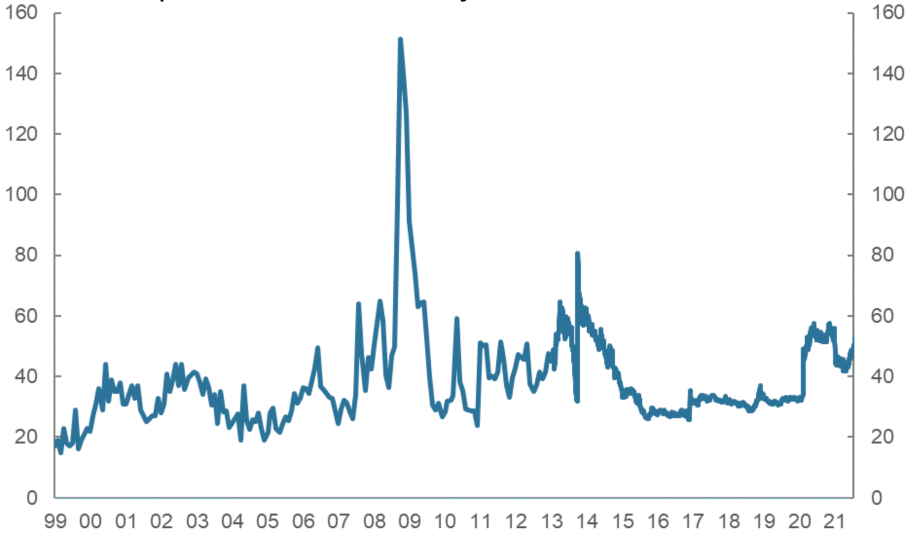
Note: Return in Norwegian kroner. Basis points. As at 30 September 2021.

Table 3: Expected relative volatility and expected shortfall

	Expected relative volatility 3-year price history	Expected relative volatility since 01.01.2007	Expected shortfall since 01.01.2007
Equity management	35	28	78
Fixed-income management	62	62	184
Fund	50	48	151

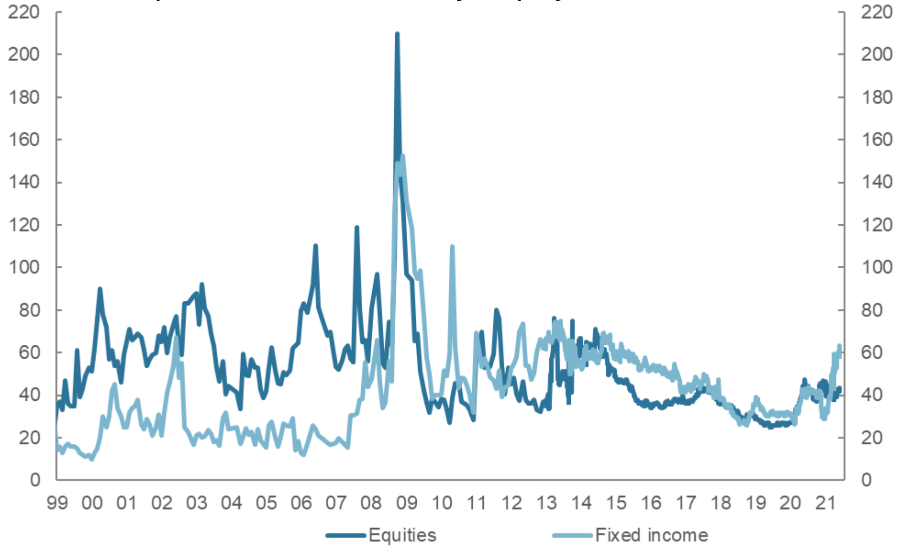
Note: Three-year relative volatility measured in Norwegian kroner. Relative volatility and expected shortfall since 1 January 2007 measured in the fund's currency basket. Basis points. As at 30 September 2021.

Chart 1: Expected relative volatility, fund



Note: Return in Norwegian kroner. Basis points.

Chart 2: Expected relative volatility, equity and fixed-income investments



Note: Return in Norwegian kroner. Basis points.

Table 4: Expected relative volatility and expected shortfall, investment strategies

	Expected relative volatility, 3-year price history	Expected relative volatility, since 01.01.2007	Expected shortfall, since 01.01.2007
Asset management	**9**	**9**	**30**
Asset positioning	9	9	30
Security selection	**14**	**14**	**37**
Internal security selection	11	12	31
External security selection	8	7	19
Allocation	**52**	**45**	**139**
Systematic factors	9	5	14
Real estate	47	44	143
Unlisted real estate	23	22	66
Listed real estate	30	29	90
Environmental related mandates	7	6	17
Allocation	17	15	42
Total	**50**	**48**	**151**

Note: Each strategy measured on a standalone basis with the other strategies positioned in line with the benchmark index. All numbers measured at the fund level. Three-year relative volatility measured in Norwegian kroner. Relative volatility and expected shortfall since 1 January 2007 measured in the fund's currency basket. Basis points. As at 30 September 2021.

Table 5: Expected relative volatility, investment strategies

	Equity management	Fixed-income managment	Real assets management	Allocation	Total
Asset management	**8**	**3**		**1**	**9**
Asset positioning	8	3		1	9
Security selection	**14**	**5**			**14**
Internal security selection	10	5			11
External security selection	8				8
Allocation	**19**	**13**	**47**	**13**	**52**
Systematic factors	9				9
Real estate			47		47
Unlisted real estate			23		23
Listed real estate			30		30
Environmental related mandates	7		1		7
Allocation	9	13		13	17
Total	**24**	**16**	**47**	**14**	**50**

Note: Each strategy measured on a standalone basis with the other strategies positioned in line with the benchmark index. All numbers measured at the fund level. Return in Norwegian kroner. Basis points. As at 30 September 2021.

Table 6: Risk distribution

	Since 01.01.1998	Last 15 years	Last 10 years	Last 5 years
Fund				
Standard deviation (percent)	0.19	0.22	0.10	0.09
Skewness	-2.34	-2.26	-0.23	-0.12
Excess kurtosis	19.24	15.22	0.47	-0.16
Equity management				
Standard deviation (percent)	0.21	0.18	0.12	0.11
Skewness	-0.76	-3.17	-0.80	-0.53
Excess kurtosis	11.06	22.80	0.87	0.02
Fixed-income management				
Standard deviation (percent)	0.28	0.34	0.12	0.09
Skewness	-0.63	-0.48	-0.20	-0.18
Excess kurtosis	19.81	12.22	0.57	1.99

Note: Characteristics of the distribution of the fund's relative return. Measured in the fund's currency basket. Before management costs. As at 30 September 2021.

Enclosure 6: Real estate management

Table 1: Return, real estate management

	Since inception	Last 10 years	Since 2017	Last 3 years
Return unlisted real estate investments (percent)	6.14	6.98	6.32	5.37
Return on listed real estate investments (percent)	4.42	-	4.08	2.08
Return on real estate management (percent)	5.74	6.56	5.65	4.37
Return on real estate management funding (percent)	n.a.	n.a.	7.18	8.05
Return difference vs funding, real estate management (percentage points)	n.a.	n.a.	-1.52	-3.68

Note: Measured in the fund's currency basket. Annualised. As at 30 September 2021. Includes unlisted real estate from 1 April 2011 and listed real estate from 1 November 2014. Before 2017, real estate was funded through a reduction in fixed-income investments.

Table 2: Relative return, unlisted real estate

	Since inception	Last 10 years	Since 2017	Last 3 years
Return on unlisted real estate investments (percent)	6.14	6.98	6.32	5.37
Return on unlisted real estate funding benchmark (percent)	n.a.	n.a.	6.29	7.31
Return difference vs funding, unlisted real estate investments (percentage points)	n.a.	n.a.	0.03	-1.95

Note: Measured in the fund's currency basket. Annualised. As at 30 September 2021. Unlisted real estate starting from 1 April 2011.

Table 3: Return at the property level

	Since inception	Last 10 years	Last 5 years	Last 3 years
Unlisted real estate management	7.25	n.a.	5.88	5.16
MSCI IPD Global real estate index	7.42	n.a.	6.64	5.76
MSCI IPD Global real estate index, portfolio weights	7.33	n.a.	6.20	5.20

Note: Measured in the fund's currency basket. Annualised, percent. As at 31 December 2020. Unlisted real estate starting from 1 April 2011. IPD index has been adjusted for transaction costs. IPD Pan-European Property Index used for 2011 and 2012.

Table 4: Revenue and cost components, unlisted real estate

	Since inception	Last 10 years	Last 5 years	Last 3 years
Rental income net of operating costs	3.81	3.81	3.57	3.49
Change in value	3.12	3.25	2.63	1.88
Transaction costs	-0.88	-0.56	-0.16	-0.13
Currency effects	0.07	0.20	0.37	0.08
Total (percent)	6.14	6.98	6.50	5.37

Note: Annualised, percentage points. As at 30 September 2021. Unlisted real estate starting from 1 April 2011.

Table 5: Relative return, listed real estate

	Since inception	Last 10 years	Since 2017	Last 3 years
Return on listed real estate investments (percent)	4.42	3.33	4.08	2.08
Return on listed real estate funding benchmark (percent)	n.a.	n.a.	9.47	9.43
Return difference vs funding, listed real estate investments (percentage points)	n.a.	n.a.	-5.40	-7.35

Note: Measured in the fund's currency basket. Annualised. As at 30 September 2021. Listed real estate starting from 1 November 2014.

Table 6: Real estate's contribution to the fund's return and risk characteristics

	2011 - 2021	2017 - 2021
Fund		
Mean	8.50	10.10
Volatility	9.71	12.16
Sharpe ratio	0.82	0.74
Fund, excl. real estate incl. funding		
Mean	8.51	10.17
Volatility	9.75	12.24
Sharpe ratio	0.82	0.74
Difference		
Mean	-0.01	-0.07
Variance ratio	0.99	0.99
Sharpe ratio	0.00	0.00

Note: Before management costs. Based on quarterly data starting from Q2 2011. Annualised. As at 30 September 2021.

Table 7: Unlisted real estate's contribution to the fund's return and risk characteristics

	2011 - 2021	2017 - 2021
Fund		
Mean	8.50	10.10
Volatility	9.71	12.16
Sharpe ratio	0.82	0.74
Fund, excl. unlisted real estate incl. funding		
Mean	8.49	10.12
Volatility	9.79	12.31
Sharpe ratio	0.81	0.73
Difference		
Mean	0.01	-0.02
Variance ratio	0.98	0.98
Sharpe ratio	0.01	0.01

Note: Before management costs. Based on quarterly data starting from Q2 2011. Annualised. As at 30 September 2021.

Table 8: Listed real estate's contribution to the fund's return and risk characteristics

	2011 - 2021	2017 - 2021
Fund		
Mean	8.50	10.10
Volatility	9.71	12.16
Sharpe ratio	0.82	0.74
Fund, excl. listed real estate incl. funding		
Mean	8.53	10.16
Volatility	9.67	12.09
Sharpe ratio	0.83	0.75
Difference		
Mean	-0.02	-0.06
Variance ratio	1.01	1.01
Sharpe ratio	-0.01	-0.01

Note: Before management costs. Based on quarterly data starting from Q2 2011. Annualised. As at 30 September 2021.

Enclosure 7: Environment-related mandates and fiscal strength

Chart 1: Exposure to fiscal strength

Note: Percent of fund. First line: Exposure to fiscal strength established. Second line: Reduced exposure as a result of improved government finances. Third line: Increased exposure as a result of weaker government finances due to coronavirus pandemic.

Chart 2: Fiscal strength – accumulated contribution to fund's excess return, billion kroner

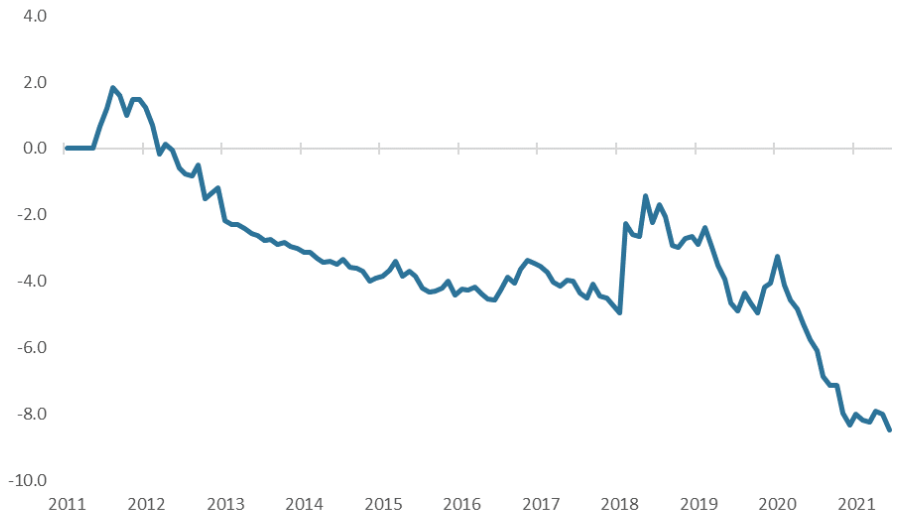
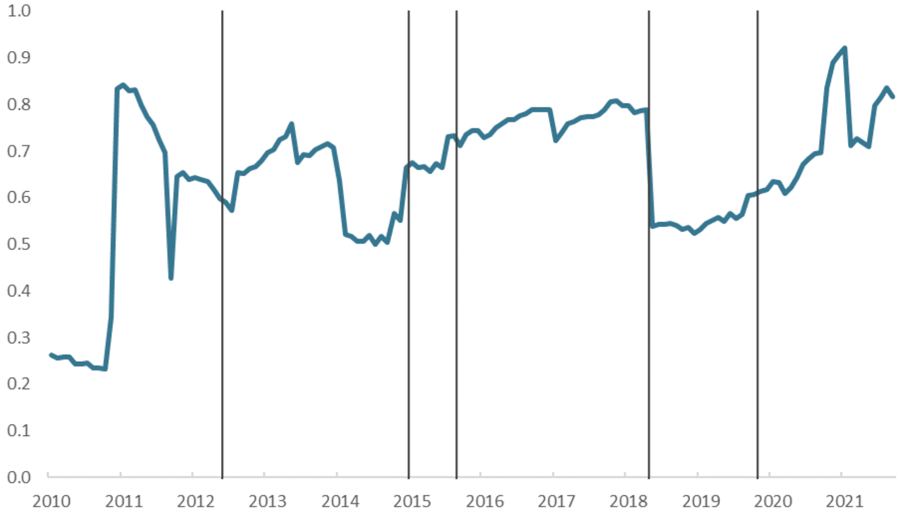


Chart 3: Exposure to environment-related mandates



Note: Percent of fund. First line: Ministry establishes range for environment-related mandates of between 20 and 30 billion kroner. Second line: Range increased to between 30 and 50 billion kroner. Third line: Range increased to between 30 and 60 billion kroner. Fourth line: External environment-related mandates discontinued. Fifth line: Range increased to between 30 and 120 billion kroner and mandate amended to allow environment-related mandates to be invested in unlisted renewable energy infrastructure.

Chart 4: Environment-related mandates – accumulated contribution to fund's excess return, billion kroner

Table 1: Expected relative volatility and expected shortfall

	Fiscal strength		Equity environmental		Fund environmental	
Date	Tracking error	Expected shortfall	Tracking error	Expected shortfall	Tracking error	Expected shortfall
2016	2		3		3	
2017	1	8	3	10	3	10
2018	2	7	2	6	2	6
2019	2	6	2	8	2	8
2020	5	17	5	13	5	13
2021Q3	4	15	7	16	7	17

Note: Relative volatility measured in Norwegian kroner. Expected shortfall measured in fund's currency basket. Annualised, basis points. As at 30 September 2021. Figures for 2016 to 2020 at year-end.