

Norwegian Ministry of Finance
Boks 8008 Dep.
0030 Oslo

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Review of Norges Bank's management of the Government Pension Fund Global

The Ministry of Finance regularly reviews Norges Bank's management of the Government Pension Fund Global (the fund). In line with established practice, a new review will be presented in the annual report to the Storting on the management of the Government Pension Fund in spring 2026. In this connection, the Ministry requests in its letter of 6 June 2025 that Norges Bank contributes with analyses and assessments.

The management mandate imposes extensive requirements for public reporting. Norges Bank places great emphasis on accurate, comprehensive and appropriate reporting on our management of the fund. The information we publish about the management of the fund has been developed over time in accordance with this. Our response in this letter is largely based on information the bank already shares with the public.

Norges Bank is satisfied that the returns for the fund overall have been good over time, and higher than the returns on the benchmark index against which the management is measured. Norges Bank's assessment is that the management has been carried out in a sound manner. The Executive Board emphasises that results in the management must be assessed over time.

In this letter, we also provide a more detailed account of the results in real estate management. The results must be seen in the context of major changes in the market since we began investing in real estate. Traditional sectors such as office and retail have been significantly changed as a result of the emergence of working from home and online shopping. More recent sectors have become investable for institutional investors. Traditional sectors now require more operational management than previously. The bank's strategic choices, including a strong emphasis on traditional sectors, a limited number of countries and cities, and an emphasis on direct investments, have resulted in a portfolio that has been vulnerable to these changes. This has contributed to the real estate portfolio delivering weaker returns than the equities and fixed income we have sold to finance the investments. Norges Bank is not satisfied with the results in real estate management, and is now making changes to the strategy for real estate. This is described in more detail in section 4.

Measured over the entire period from 1998 to the end of the third quarter of 2025, the annual return for the fund has been 6.59 per cent. This is 0.24 percentage points higher than the annual return on the benchmark index against which the fund is measured. Annual real return, after deducting management costs, has been 4.28 per cent since the fund's inception. Returns have been particularly strong over the past five years, with an annual return of 9.71 per cent. This is 0.30 percentage points higher than the benchmark index. Annual real return, after deducting management costs, has been 5.39 per cent over the same period.

The management shall be cost-effective. Norges Bank is satisfied that management costs are low compared with other managers. Transaction costs that are directly related to the purchase and sale of securities are charged directly to the portfolio result and are not part of the management costs. For a large fund, such transaction costs can amount to significant sums, and we work continuously to keep transaction costs low. Low costs are not a goal in themselves, but a cost-effective implementation of the management contributes to the goal of achieving the highest possible returns after costs.

In its letter of 6 June, the Ministry asks the bank to assess the results achieved in the management since 1998 and for various periods. In this letter, we primarily describe the entire period and the past five years.¹ In the enclosure, we show figures for various periods.

1. Risk and utilisation of limits

Relative risk and utilisation of limits

A key limit in the management mandate is the limit for expected relative volatility. The fund's investments are managed within a limit for expected relative volatility of 1.25 percentage points. This limit regulates how much the return on the fund can be expected to deviate from the return on the benchmark index under normal market conditions. Overall for the portfolio, expected relative volatility was measured at 41 basis points at the end of the third quarter of 2025. This was 9 basis points lower than at the previous review of the bank's active management in 2021. The reduction is primarily due to the fact that the strong volatility in financial markets during the coronavirus pandemic is no longer part of the calculation basis. Expected relative volatility has averaged 43 basis points over the past five years.

In calculating expected relative volatility, we use price data from the past three years. This ex ante calculation can be compared with an ex post calculation where we use the actual return history. A comparison over the past five years shows that the model we use

¹ Up to the end of the third quarter of 2025.

to calculate expected relative volatility (ex ante) corresponds well with results based on actual return figures (ex post).

Norges Bank uses various strategies in the management of the fund, see further description in section 3. The expected relative volatility for the fund overall is lower than the sum of the three main strategies in the management. This reflects, among other things, that the various strategies diversify the fund's overall relative risk. If market conditions change, the opportunities to exploit our advantages may mean that we increase the weighting of one or more of the strategies. This can also affect the diversification effects.

Market conditions affect calculated expected relative volatility. When market volatility increases, the calculated expected relative volatility will also increase, even if Norges Bank keeps its positions unchanged. By keeping the utilisation of the limit somewhat lower than the limit set by the Ministry of Finance, the bank will be able to maintain strategies without having to make adjustments during challenging market conditions, and have room to increase deviations from the benchmark index when investment opportunities arise.

In line with our strategic plan, we will vary the active risk-taking as market conditions change. It is therefore difficult to provide forward-looking assessments of how the relative results will develop in the event of major fluctuations in the markets. In enclosure 3, we show a factor analysis of the fund's relative return over different time periods.² The analysis shows how the fund's historical excess return can be decomposed into different risk factors, including market risk. In the current strategic period, we have taken allocation positions, among other things, to exploit variations in market prices and to manage the fund's overall risk profile. Negative relative market exposure over the past five years is in line with this risk management.³ Low market exposure over longer time periods suggests that market movements have on average had limited impact on the fund's relative results.

Unlisted investments

Unlisted real estate and unlisted renewable energy infrastructure are not part of the benchmark index, and investments in these asset classes therefore draw on the limit for expected relative volatility. Deviations between asset classes increase expected relative volatility for the fund more than deviations within asset classes. Investments in unlisted real estate therefore increase expected relative volatility proportionately more than other investment strategies. In line with the current strategic plan, Norges Bank plans to

² This analysis has several limitations. Factor exposures and correlations may change during large market movements. Factors not included in the model may also have an impact under extreme market conditions. The regression analysis is based on average relationships over different time periods, and does not capture changes that occur from month to month or in specific market situations.

³ The finding is not statistically significant.

continue building up investments in unlisted renewable energy infrastructure. This will draw on the limit for expected relative volatility.

Investments in unlisted markets are more challenging to manage within a limit for relative volatility. The calculation of relative volatility is based on weekly return figures, but unlisted investments are not priced continuously in the market. To calculate expected relative volatility and other risk measures for these investments, the return must therefore be modelled. The calculations are based on a number of assumptions that in periods can materially affect the measured risk. Norges Bank has experienced that short-term fluctuations in listed markets can lead to abrupt changes in measured relative volatility. It is not possible to adjust the portfolio of unlisted investments quickly to counteract large fluctuations in measured relative volatility. Relative volatility can therefore not be used as a management tool in the same way as for listed investments. The experience with expected relative volatility as a risk limit for unlisted investments is described in more detail in a letter to the Ministry of Finance dated 27 November 2023.

Because unlisted investments are not priced continuously in the market, the valuation of such investments may have a time lag, and returns may appear smoothed compared with the returns on listed equities and fixed income. In calculating expected relative volatility (ex ante) for the unlisted real estate portfolio, adjusted figures are used to account for such smoothing. Actual and adjusted return figures give approximately the same measured relative volatility (ex post) for the unlisted real estate portfolio.⁴ Taking into account methodological differences, there is good correspondence between ex ante and ex post calculations of relative volatility for both listed and unlisted investments.

Beyond relative volatility, we manage the risk of unlisted investments along a number of dimensions. The Executive Board has, in line with the mandate from the Ministry of Finance, set several different limits for the portfolio's exposure. This includes, among other things, limits for exposure to different geographies, sectors, development risk and individual partners. Leverage is measured both at portfolio level and for each individual investment. The economic vacancy rate⁵ in the unlisted real estate portfolio is measured quarterly at portfolio, city and region level and is monitored over time to identify trends. Concentration risk is limited through maximum limits for ownership in individual companies, co-investment with individual partners, and for infrastructure also ownership in individual projects and committed capital per fund. The return on unlisted investments is decomposed into rental income, value changes and currency effects, etc., to be able to analyse what drives the results. We measure risk-adjusted return with key figures such as information ratio, Sharpe ratio and Jensen's alpha over different time periods.

⁴ Absolute volatility increases somewhat in calculations made with figures adjusted for smoothing. At the same time, these adjustments mean that the return profile for the unlisted portfolio more closely resembles returns in listed markets. Overall, these effects mean that the change in measured relative volatility is small. Over time and when using annual return figures, the effect of smoothed return figures for unlisted real estate diminishes, see also discussion note #3 2023.

⁵ Economic vacancy is a measure of loss of rental income due to vacant space or reduced rent compared with market rent.

Assessment of the limit for deviations

The Ministry asks Norges Bank to assess whether the size of the limit for deviations from the benchmark index, measured by expected relative volatility, is appropriate for the management assignment.

Risk in financial markets may increase going forward. In more volatile markets, the deviations between the fund's portfolio and the benchmark index can become more unpredictable, and calculated relative volatility may increase even if we make no changes to how the fund is positioned relative to the benchmark index. This could argue for a somewhat higher limit over time. A larger limit would give the bank more room for manoeuvre to make other adjustments in periods where the increase in relative volatility is due to market turmoil, and not changes in our investment choices.

Expected relative volatility is by definition unknown and must be estimated. These calculations use historical market data, and the models assume that historical market fluctuations and covariances provide an indication of future market developments. This can lead to procyclical risk management in the event of sudden changes in market volatility. As risk premiums tend to move with volatility, this may mean that the fund must reduce risk precisely when it would be most profitable to increase it. The limit for expected relative volatility should therefore be sufficiently large for us to exploit the fund's characteristics also in periods of high volatility in the markets.

Overall, we assess that the limit for expected relative volatility is sufficient today, given the current management model. At the same time, the conditions discussed above may mean that it may be appropriate to reassess this in the future.

Supplementary risk limits

In line with requirements in the mandate, the Executive Board shall set a supplementary risk limit for how much lower than the benchmark index the fund's return can be in extreme situations, so-called extreme deviation risk. The limit is formulated as an 'expected shortfall' limit. 'Expected shortfall' is the average of the deviations that can be expected beyond a given probability. Our calculation starts in 2007 and expands continuously from this point. At the end of the third quarter of 2025, extreme deviation risk was measured at 111 basis points annually, at the 97.5 per cent confidence level.⁶ The Executive Board has set a limit for extreme deviation risk of 375 basis points.

2. Results

Results achieved since 1998

⁶ Average deviation in the 2.5 per cent weakest observations.

The fund's annual return from 1998 to the end of the third quarter of 2025 has been 6.59 per cent, measured in the fund's currency basket. For equity investments, the annual return has been 7.37 per cent, and for fixed income investments 3.86 per cent over the entire period, also measured in the currency basket. The fund's currency basket is not a fixed unit, but a weighted composition of the currencies in the fund's benchmark index applicable at any given time. This means that we measure the results of the investment strategy and the development in the underlying investments, without exchange rate changes between Norwegian kroner and the investment currencies directly affecting the result. The strategy for the fund and the benchmark index have been developed and changed over time. In parallel with these strategic changes, the currency basket has also changed composition. Results from different time periods cannot therefore be compared directly.

The fund's annual return after deducting management costs and inflation has been 4.28 per cent since 1998. The goal for the management is the highest possible return after costs. We have high cost awareness in the management and constantly seek to realise economies of scale. Over the past five years, management costs have amounted to 4 basis points of managed capital, compared with 7 basis points for the entire period. In an annual report prepared by CEM Benchmarking Inc. for the Ministry of Finance, the management costs in the fund are compared with other large funds. The report for 2023, which is the most recent available, shows that Norges Bank's management costs are low compared with other funds.

The fund's annual excess return since 1998 has been 0.24 percentage points compared with the benchmark index set by the Ministry. Equity investments' annual excess return has been 0.38 percentage points compared with the equity part of the benchmark index. Fixed income investments' annual excess return has been 0.26 percentage points compared with the fixed income part of the benchmark index. The excess return for the portfolio overall is positive also after risk adjustments and costs.⁷

Results achieved over the past five years

Over the past five years, the annual return on the fund has been 9.71 per cent, with 13.87 for equities and -0.38 per cent for fixed income. The annual return after deducting costs and inflation has been 5.39 per cent. Annual excess return has been 0.30 per cent.

The fund's investments in real estate and unlisted renewable energy infrastructure are not included in the benchmark index set by the Ministry.⁸ To finance these investments, we sell equities and fixed income from the benchmark index. Which equities and fixed income are sold depends on the country and currency in which the investment is made. When we measure the relative return on equity and fixed income management, we base this on the benchmark index adjusted for the equities and fixed income we have sold to finance investments in real estate and unlisted renewable energy infrastructure. The

⁷ For further information, see enclosures 2 and 3.

⁸ Real estate was included in the benchmark index until 2017.

return on real estate and infrastructure investments is measured against the equities and fixed income that have been sold to finance the investments. Measured in this way, the relative return from the management of equities, fixed income and real assets will add up to the investment portfolio's total relative return measured against the index set by the Ministry.

Over the past five years, equity management's contribution to the fund's relative return has been 0.31 percentage points. Internal equity management contributed 0.24 percentage points, and external equity management contributed 0.07 percentage points.

Over the past five years, fixed income management's contribution to annual excess return has been 0.18 percentage points. The fixed income strategies within market exposure and allocation have both contributed positively to excess return in this period, with 0.07 and 0.12 percentage points respectively. The contribution from security selection has been 0.0 percentage points.

Real estate management has contributed -0.13 percentage points over the past five years. Unlisted infrastructure has contributed positively with 0.01 percentage points. Other allocation has made a negative contribution of -0.06 percentage points.

Value creation through active management

The fund is managed within a limited limit for deviations from the benchmark index. However, all our investment strategies contain active elements. A strategy without active elements, a so-called passive strategy, involves replicating the return on the benchmark index as accurately as possible, rather than seeking excess return. In Norges Bank's assessment, such a strategy is not in line with the investment strategy set by the Ministry or with the goal of achieving the highest possible returns after costs.⁹

To produce an estimate of the value creation from active management, we compare the fund's excess return after management costs with the results that could have been achieved with a passive strategy. We assume that a passive strategy would have had the same return as the benchmark index minus costs related to the purchase and sale of securities. In addition, there will be income from securities lending. Management costs will be incurred in the form of, among other things, personnel costs and costs related to various systems and data.¹⁰

The Ministry of Finance has previously stated that excess return before deducting costs is a good estimate of net value creation. In Report to the Storting No. 9 (2021–2022), the Ministry assessed that the costs of passive management had fallen in the preceding years as a result of smaller inflows to the fund and fewer index changes. To measure value creation from active management going forward, the Ministry believed that part of

⁹ Investments in unlisted real estate and unlisted renewable energy infrastructure will, for example, not be compatible with a passive strategy.

¹⁰ See enclosure 5 for further details, calculations as at year-end 2024.

the management costs should be deducted. The proportion that should be deducted will depend, among other things, on changes in the benchmark index and the size of future inflows to the fund.

For the period up to the end of 2024, the actual return after costs has been 24 basis points higher than what a passive strategy would have yielded after costs. Over the past five years¹¹, the difference is somewhat larger, at 28 basis points. The difference between a strategy with active elements and a passive strategy is therefore very close to the fund's excess return before costs. It is therefore the bank's assessment that excess return before costs is a good estimate of value creation from active management.

3. Norges Bank's investment strategies

Norges Bank's main strategies

The Ministry of Finance sets the overall investment strategy for the fund. The Executive Board sets, in line with the management mandate, a strategic plan for how the management assignment is to be carried out. We plan to publish a new strategic plan for the period 2026–2028 in December 2025.

We use various investment strategies to manage the fund with acceptable risk and within the limits set by the Ministry. Since 2013, Norges Bank has grouped the management into three main strategies: market exposure, security selection and allocation. We report return, risk and costs for these three main strategies.

The investment strategies are adapted to the fund's characteristics as a large, long-term investor with limited short-term liquidity needs and low management costs. We use the main strategies across the management. The main strategies complement each other in that they have different time horizons, are based on different analytical frameworks, and are expected to generate excess returns under different market conditions. We do not expect all strategies to generate excess returns at all times. The goal is that they should collectively generate excess returns over time.

Over the past five years, the fund's main strategies have generated an annual excess return of 0.30 percentage points. The strategies for market exposure, security selection and allocation have all contributed positively to excess return in this period, with 0.17, 0.10 and 0.03 percentage points respectively. The various strategies' contribution to management costs is shown in enclosure 2.

Within the market exposure strategy, the contribution from positioning and securities lending was 0.13 percentage points and 0.04 percentage points respectively. These strategies have made consistently positive contributions to excess return over time. At the same time, these are strategies that can also involve larger fluctuations, especially in

¹¹ Up to the end of 2024.

periods of market turmoil and in less liquid markets. Within security selection, the contribution from internal and external security selection has been 0.04 percentage points and 0.07 percentage points respectively over the past five years. Strategies within security selection are not necessarily expected to generate excess returns every year, but the annual contribution from external security selection has been positive over time. Internal security selection has contributed positively to excess return in four of the past five years, and in eight of the years since 2013. Within allocation, real estate has contributed negatively to excess return over the past five years, with -0.04 percentage points and -0.09 percentage points for listed and unlisted real estate respectively. Unlisted renewable energy infrastructure has contributed positively with 0.01 percentage points. Other allocation decisions have in the same period made a positive contribution of 0.16 percentage points.

Norges Bank's strategic plans for the management of the fund are three-year plans. In line with the mandate from the Ministry of Finance, the Executive Board evaluates the extent to which the goals in the strategic plans have been achieved at the end of each strategic period. These evaluations are sent to the Ministry. The three-year plans make it possible to make necessary adjustments within the framework of a much more long-term overall strategy. The Executive Board emphasises that the overall results must be assessed over time.

The main strategies market exposure, security selection and allocation include strategies with different investment horizons and expected return patterns. Common to all the bank's strategies is that the evaluation horizons should be sufficiently long for the strategies to be assessed through different parts of the market cycle. For investments in real estate and unlisted renewable energy infrastructure, the investment horizon is long, and the implementation of strategies in these asset classes will extend over several years. The evaluation horizon should take this into account. Unlisted renewable energy infrastructure is furthermore a new asset class for the fund and still in a build-up phase.¹² The results of investments in real estate and infrastructure are measured against the equities and fixed income that have been sold to finance them. The evaluation horizon should take into account that short-term fluctuations in listed markets can give a picture of results in real estate and infrastructure that is not necessarily representative in the long term.

Since 2009, the Ministry of Finance has conducted reviews of active management every four years, with the purpose of contributing to transparency, building trust and strengthening the ability to stick to long-term investment strategies. Norges Bank believes such reviews should be carried out at fixed time intervals, and has no comments on the Ministry evaluating active management every four years. In light of the conditions discussed above, the Ministry may also consider whether it is appropriate for somewhat longer time to pass between each review.

¹² The fund had only one investment in unlisted renewable energy infrastructure until 2023.

Market exposure

We manage the majority of the portfolio internally through the market exposure strategy. The strategy encompasses management of broad equity and fixed income portfolios, ongoing trading and handling of cash, currency and securities lending.

We seek excess returns by following various indexing strategies. We invest broadly in the equities and fixed income in the benchmark index, but to reduce transaction costs we avoid implementing index changes mechanically. As a large investor, we can develop systems and strategies that would be too costly for smaller funds. We are active in capital market and corporate events, where the fund's size makes us an attractive partner.

New inflows to the fund, reinvestment of dividend payments and changes in the benchmark index require us to continuously make changes to the portfolio. These adjustments involve buying and selling securities. Such trading activity represents costs for the fund. For equities and fixed income, direct transaction costs normally include brokerage and transaction tax. In addition to the direct costs, indirect costs are incurred when we invest, as a result of price fluctuations from the time we initiate the trade in the market until it is completed.¹³

Over time, we have developed a number of systems to streamline portfolio management and keep trading costs low. To the extent possible, we consolidate as much of the fund's total trading needs as possible. This allows for different trading needs to be offset against each other and total trading volume in the market to be reduced. We have focused on increasing trading with other end investors, so-called block trading. In such trading, the fund is less visible in the market and achieves more favourable prices for large and less liquid transactions. Furthermore, we have developed our own systems to give portfolio managers an overview of future trading needs. This enables portfolio managers to assess whether they should trade quickly, or wait for opportunities to offset today's trading needs against future needs. We use various AI and machine learning tools both to predict future trading needs and to support the implementation of trades. Overall, these measures have contributed to a reduction in transaction costs despite changes in the benchmark index and large transfers having led to a significant increase in trading volume in this strategic period. We estimate that the sum of tools we use keeps trading costs between 15 and 20 per cent lower than they would otherwise have been.

The fund's characteristics, including a large and stable holding of securities, make us an attractive partner for securities lending. We will continue with responsible lending of equities, and seek to secure a larger share of the income through improved management of cash collateral and diversification of counterparties.

¹³ In the annual report for 2024, we have estimated the indirect costs for internal equity management at approximately 16 billion kroner in 2024. This amount is approximately unchanged from 2023, despite increased activity levels in 2024.

Security selection

The security selection strategy involves analysing companies and assessing whether the fund should invest more or less in them compared with the benchmark index. The goal of such deviations from the benchmark index is to increase returns. The fund's long time horizon means we can invest differently from other investors, also during challenging market conditions, and make investments where it may take a long time before the underlying value is realised. The selection of individual securities is based on thorough analyses, and is done by both internal and external portfolio managers. For the portfolio overall, this can lead to overweight or underweight in individual sectors and segments, but these deviations will normally be of moderate size.

As a large and long-term owner, we have very good access to individual companies, and have regular meetings with companies' management, board members and various experts. We use this competitive advantage to increase our knowledge about the companies, including the quality of management, and the industries they operate in. To take advantage of access to individual companies, internal security selection is organised so that portfolio managers follow a limited number of companies and manage relatively concentrated portfolios. This enables in-depth analysis and closer monitoring of each individual investment. The internal managers are sector specialists who over time have developed particular expertise within their respective areas, among other things through conversations with many companies within the same sector or value chain. This makes it possible to identify deviations between the market's expectations and the company's underlying value or long-term potential.

We use external managers in markets and segments where local knowledge and external expertise can improve returns. In emerging markets, for example, information gathering can be more demanding, and proximity to the market is therefore very important. Most of our equity investments in emerging markets are managed externally, with the exception of the largest markets which are also managed internally. We also have external mandates in market segments that require specialist expertise we do not have internally. This includes mandates targeting small companies and sectors undergoing structural changes.

In 2024, we for the first time allocated mandates where external managers are given the opportunity to sell more equities than are included in the index against which the external manager is measured, but not more equities than are included in the fund's total equity index. The fund overall can therefore not sell more of an individual equity than is included in the benchmark index. Through this arrangement, we will be able to reduce exposure to companies where external managers assess that the business model has weaknesses or market pricing is excessive.

At the end of the third quarter of 2025, 7.5 per cent of equity investments were managed externally. The results in external management have been very good over time.

Allocation

We will occasionally take allocation positions when extraordinary market conditions create good investment opportunities or when we see a need to adjust the fund's overall risk profile. This can also include overweight or underweight of various sectors or segments. Examples of situations where such investment opportunities can arise are if other investors are constrained by behavioural factors, regulatory requirements or financing needs, and our long-term investment horizon can be a competitive advantage. With a delegated mandate structure, there may furthermore be a need to adjust the fund's overall risk profile, even if individual portfolios are well positioned. For example, we have had a cautious approach to equity markets in recent years. This has made a negative contribution to excess return.

The fund's size, long investment horizon and limited liquidity needs are characteristics that can provide advantages with unlisted investments and investment opportunities that are not available to all investors. We take advantage of these characteristics through investments in real estate and unlisted renewable energy infrastructure. The management of real estate and unlisted infrastructure is described in more detail under points 4, 5 and 6.

Organisation and decision-making processes

Responsibility for investment decisions follows a delegated mandate structure. The Executive Board of Norges Bank has delegated the operational implementation of the management to Norges Bank Investment Management within supplementary governing documents.¹⁴ These include Job Description for the CEO of Norges Bank Investment Management, Investment Mandate for the CEO of Norges Bank Investment Management, and principles documents for various parts of the management. The Executive Board's investment mandate to the CEO of Norges Bank Investment Management sets limits for the management of the fund within the Ministry of Finance's overall mandate. The Executive Board reviews and updates the investment mandate annually.

The CEO of Norges Bank Investment Management sets, within his investment mandate, guidelines and delegates mandates further to the directors for market strategies and active strategies, who in turn issue mandates to managers for various investment areas. The individual investment mandates all have their own investment universe and a set of risk limits. The delegated model facilitates investment decisions being made on the basis of in-depth knowledge of market segments and individual companies. At the same time, it facilitates precise control and monitoring of risk, return measurement, costs and incentives for each individual investment mandate. At the end of the third quarter of 2025, we had 292 individual mandates, of which 118 were with external managers.

¹⁴ The Executive Board's governing documents for the management of the fund are publicly available.

Within the market exposure strategy, overall mandates are given to manager groups that manage broad portfolios. Within security selection, mandates are issued to each individual portfolio manager. The internal portfolio managers are organised in sector-based departments and are specialists in the market segments and individual companies they follow. External managers are used in markets where local knowledge is particularly important, and it is not appropriate to build up internal expertise. External managers are selected after a comprehensive process and are monitored by a separate internal department.

All individual mandates are financed by and measured against their own benchmark index (so-called internal benchmark indices).¹⁵ These benchmark indices are an internal management tool that enables precise measurement of the results achieved by each individual manager. It is only equities and fixed income that are included in the benchmark index set by the Ministry that are included in the internal benchmark indices, and the sum of all internal benchmark indices equals the benchmark index set by the Ministry.¹⁶ This means that total relative return for the mandates equals the return difference between the fund in total and the benchmark index from the Ministry. The relative return reported under the bank's main strategies is the sum of the return on all mandates, measured against the sum of the return on the mandates' benchmark indices.

The internal benchmark indices are composed to best possible represent each individual mandate's design and scope. The internal benchmark indices within the security selection strategy are specialised within individual sectors and markets. An internal portfolio manager who manages technology equities will, for example, be measured against a benchmark index consisting of a selection of technology companies. An external manager who manages equities in a given emerging market will have a benchmark index consisting of equities in the relevant market. The markets and sectors for which we have individual mandates in, and thus internal benchmark indices for, will vary over time.

Internal benchmark indices within market exposure consist of a large number of equities or fixed income, while they mirror each mandate's design and scope. A manager with responsibility for government bonds in Asia will, for example, be measured against a benchmark index composed of the Asian government bonds included in the benchmark index from the Ministry. The sum of the internal benchmark indices within the market exposure strategy will be the benchmark index set by the Ministry adjusted for the financing of mandates for other active strategies.

¹⁵ The establishment and implementation of internal benchmark indices was subject to an independent review (attestation engagement) conducted by Deloitte AS on behalf of Norges Bank's Supervisory Council in 2020. Deloitte's assessment was that the internal benchmark indices were essentially designed and implemented in accordance with the established measurement criteria.

¹⁶ Frontier markets are not included in the benchmark index from the Ministry of Finance. For external mandates in frontier markets, emerging markets that are part of the benchmark index from the Ministry will constitute the financing of the external mandate, whilst the investment universe is defined by an index consisting of equities in the relevant market.

Within their mandate and associated risk limits, individual portfolio managers have a large degree of freedom, and different portfolio managers will have different processes for security selection. Both internal and external portfolio managers are evaluated continuously. The managers for the various investment areas can, on the basis of such evaluations, decide whether individual mandates are scaled up or down, or whether they should be terminated.

The management team at Norges Bank Investment Management holds a weekly investment meeting, where representatives from various investment areas also participate. The investment meeting is a discussion forum for decisions that lie with the CEO. Market developments are a regular topic discussed in these meetings, and the CEO can, on the basis of assessments of the fund's overall risk profile, take allocation positions. Examples of other decisions that are not delegated and which are discussed at the meetings are investments that are larger than given threshold amounts.

The Executive Board sets the overall framework for investments in real assets, including risk limits and delimitations by sector and geography. Within this framework, Norges Bank Investment Management sets more detailed strategies. Investment decisions for individual transactions are made at department level, and in the investment meeting for larger investments. Investments above certain thresholds require approval by the Executive Board. Investments that are considered to be of unusual nature or of great significance must also be approved by the Executive Board.

4. Real estate management

Background

The Ministry of Finance established guidelines for investments in real estate in 2010. Real estate was from the start a strategic allocation of five per cent of the benchmark index. The fixed income part of the index was reduced correspondingly. Among the arguments for including real estate investments were to further spread the risk in the fund, harvest premiums from investments in less liquid assets and increase the fund's investments in real assets. Due to uncertainty about legal and tax matters, real estate investments were initially limited to Europe. Over time, the ambition was to build up a diversified, global real estate portfolio. The strategy from the start was to make direct investments together with partners in selected major cities in Europe and the USA. In 2011, a mandate for listed real estate investments was also established within the internal security selection department. This mandate moved into real estate management in 2014.

From 2017, the Ministry of Finance changed the mandate regulation, and the benchmark index no longer has a strategic allocation to real estate. Since 2017, real estate investments have been regulated within the limit for deviations from the benchmark index, and are financed by selling equities and fixed income included in the benchmark

index. Whether the fund should be invested in real estate and how the investments should be designed has since 2017 been delegated to Norges Bank within an upper limit of seven per cent of the fund.

In 2019, Norges Bank made certain changes to the real estate strategy, and listed and unlisted real estate were to a greater extent viewed in conjunction.¹⁷ The unlisted portfolio was largely continued as before, but the combined strategy made it possible to achieve better sector diversification through the listed investments. The updated strategy emphasised cost-effectiveness and investments that required limited resources, and the growth in the real estate portfolio since 2019 has mainly been in the listed portfolio. Among the arguments for a combined real estate strategy is that we expect listed and unlisted real estate to have similar return and risk characteristics in the long term. Unlisted and listed real estate accounted for 1.8 per cent and 1.6 per cent of the fund respectively at the end of the third quarter of 2025.

Assessment of results in real estate management

In assessing real estate management, we have taken as our starting point three different sub-periods: from 2011, when real estate became part of the benchmark index, from 2017 when the mandate regulation was changed, and from 2019 when we changed the strategy for listed investments.

Combined real estate strategy

In table 1 in enclosure 6, we show the results in real estate management measured against the financing. The real estate portfolio has had weaker returns since 2017 than the equities and fixed income we have sold to finance the investments. The results for the past five years must at the same time be seen in the context of, among other things, strong equity returns in the period. The effects of the coronavirus pandemic in 2020 and the interest rate rise in 2022 also had a particularly negative impact on the real estate market in this period. The results in this period should therefore be interpreted with caution.

To analyse how real estate investments have affected the fund's overall return and risk, we calculate a hypothetical portfolio where the fund's real estate investments are replaced with the equities and fixed income we have sold to finance the investments. Since 2011, the relationship between return and risk in the fund has been approximately the same as for a fund without real estate, see table 6 enclosure 6.¹⁸ The fund has had both somewhat lower return and measured volatility compared with a fund without real estate. The fund's unlisted real estate investments have had approximately the same

¹⁷ See letter to the Ministry of Finance dated 7 February 2019.

¹⁸ The Ministry notes that different valuation methods can lead to returns on unlisted real estate being lagged and smoothed over time compared with returns on equities and fixed income, and asks Norges Bank to seek to correct for this in the analysis. Return figures adjusted for smoothing give the same Sharpe ratio as when using actual returns.

return, but lower measured volatility than the equities and fixed income we have sold to finance the real estate investments, and have therefore marginally improved the trade-off between return and risk. The fund's listed real estate investments have had somewhat lower return and somewhat higher volatility than the financing.

The Ministry asks Norges Bank to assess the results achieved against relevant targets. We have compared the results in the management against the MSCI Global Annual Property Index (hereinafter referred to as MSCI Global), which is the broadest available index for real estate investments. MSCI Global as a benchmark has, however, certain weaknesses. It has not been a goal that the portfolio should be invested in line with MSCI Global, which is also not investable. MSCI Global is constructed based on the valuations other institutional investors report for their unlisted real estate investments. There have been particularly large changes in valuations since the coronavirus pandemic, and there is different practice as to when investors make write-downs. Given large changes in real estate values, there is greater uncertainty in recent years regarding the figures that form the basis for the index.

The combined real estate portfolio since 2019 has had lower returns than the broad real estate index from MSCI. The combined real estate portfolio had significant exposure to the office sector at the start of a period of major structural changes in this sector. It is especially the office sector that pulls down results, for both the listed and unlisted portfolio.

Unlisted real estate

The unlisted portfolio has since 2011 had lower returns than MSCI's broad real estate index. Returns compared with MSCI Global have been particularly weak over the past five years. The underperformance can be attributed to strategic choices and decisions at various levels.

The unlisted real estate portfolio is invested in developed markets in Europe, the USA and Japan, and thus has a different country and sector allocation than MSCI Global. Direct investments in unlisted real estate require local presence and expertise in the areas and sectors invested in. We have limited the unlisted portfolio to a selection of strategic cities, where we mainly invest in high-quality office and retail real estate with central locations. In addition, we invest in logistics real estate globally. In the selection of strategic cities¹⁹, emphasis has been placed on, among other things, market size and expected number of large transactions. Cities with prospects for economic and employment growth were prioritised, as this was assumed to contribute to high and stable demand for real estate over time.

Compared with MSCI Global, the unlisted real estate portfolio has been overweight office and retail. While the logistics sector is the real estate sector that has had the highest

¹⁹ New York, Boston, Washington D.C., San Francisco, London, Paris, Berlin and Tokyo.

return in the period we are looking at, office and retail have yielded weaker returns than MSCI Global. The office sector has accounted for a large part of the real estate portfolio, and has had particularly weak development, especially in the USA. The residential sector has had the second-highest return in the period, but this is a sector we did not consider it appropriate to make direct, unlisted investments in. Other sectors were from the beginning assessed as too small for them to be relevant for the unlisted portfolio.

Overall, the limitation of the portfolio to selected countries, cities and sectors has contributed negatively to the portfolio's return compared with MSCI Global. Within the strategic cities, we have specified which areas we want to focus investments in office and retail in. The choice of such focus areas within cities has contributed somewhat positively, while the choice of individual properties within the focus areas has contributed negatively. Which individual properties have been available to invest in is limited by and must be seen in context with the other design of the strategy.²⁰

Listed real estate

The purpose of the listed real estate portfolio until late 2018 was to build a concentrated portfolio of companies with similar assets to the unlisted portfolio. The return on listed real estate investments was good in this period. Since 2019, the listed real estate investments have, among other things, had the purpose of contributing sector diversification to the overall real estate portfolio. As a result of the previous strategy, however, the listed portfolio had a high weight in the office sector, especially in the USA, when the strategy was changed in 2019. Since the strategy change, the listed real estate portfolio has grown, especially within sectors we have not considered relevant for the unlisted portfolio, including the residential sector.

The return on the listed real estate portfolio over the past five years has been weaker than the financing of the investments. The results must be seen in context with developments in the real estate market generally, which has been characterised by interest rate rises and lower demand for office real estate since the coronavirus pandemic. The office sector has accounted for a significant part also of the listed portfolio, and has contributed negatively.

Summary and implications for work on new strategic plan

Norges Bank's real estate strategy and portfolio were first established while there was a strategic allocation to real estate in the benchmark index set by the Ministry of Finance. Since then, the real estate market has undergone major changes. Traditional sectors such as office and retail have been significantly changed by the rise of remote work and online shopping, while more recent sectors such as data centres, warehouse real estate

²⁰ In a letter to the Ministry dated 15 December 2017, Norges Bank wrote, among other things, that "[w]e invest in high-quality buildings with a location we expect will be attractive in the long term. These are often buildings with low direct yields, but which we believe will attract tenants for a long time and increase the long-term nature of the investments with associated reduced transaction costs".

and specialised residential sectors, for example student housing, have become investable for institutional investors. In addition to the emergence of more recent sectors of a more operational nature, traditional sectors also now require more operational management than previously.²¹ The bank's strategic choices, including a strong emphasis on traditional sectors, a limited number of countries and cities, and mainly direct investments, have resulted in a portfolio that has been vulnerable to major changes in the real estate market. This has contributed to the real estate portfolio having had weaker returns than the equities and fixed income we have sold to finance the investments. Development trends in the market and experiences from real estate management now warrant an adjustment to our real estate strategy.

Norges Bank Investment Management's department for real estate and unlisted infrastructure was merged with the equity department into a combined department for active strategies with effect from 1 January 2025. The goal of the merger is to strengthen the management of both investment areas by bringing together employees with complementary expertise. Norges Bank Investment Management hired a new head of real estate investments in spring 2025 and simultaneously started work on adjustments to the real estate strategy. The Executive Board has taken part in this work as part of the work on the new strategic plan to be published in December 2025.

Strategy for real estate management

The overall goal for the management of the fund is to achieve the highest possible return after costs, within the limits that apply to the management.²² We invest in real estate as part of active management. By exploiting the fund's characteristics, the goal of active management is to achieve excess returns over time. In the strategic plan for 2026–2028, we plan to clarify that we invest in real assets to improve returns in the fund. Investments in real assets will also be able to improve the long-term relationship between return and risk in the fund.

The fund's size and reputation provide investment opportunities that are not available to all investors, and the opportunity to negotiate better terms. A long investment horizon and limited short-term liquidity needs mean we can also invest in periods where other investors may have financing challenges. To better exploit the fund's characteristics, we will going forward adopt a broader approach to real estate investments.

Among the considerations we will emphasise in the strategic plan for the period 2026–2028 is the need for the portfolio to be better balanced across a broader range of

²¹ Comparable funds have adapted to developments in the real estate market by increasing allocations to newer sectors at the expense of office and retail. To enable this transition, comparable funds combine direct investments to a greater extent with indirect investments that provide access to specialist expertise and operational capacity.

²² The expert group that assessed active management for the Ministry in 2021 noted that Norges Bank states that the purpose of unlisted investments is to achieve better diversification of the fund, whilst the mandate regulation means that the bank only has incentives to invest in asset classes outside the benchmark index if the bank expects to achieve excess returns.

sectors. Where the most attractive investment opportunities are located will vary over time. Going forward, the portfolio's geographical composition will follow from assessments of individual transactions and sectors, and will not be limited to predetermined countries and cities.

Historically, we have placed great emphasis on direct investments, which require in-depth local knowledge and a high degree of specialisation. The number of markets and sectors we can cover internally is therefore limited. Direct investments with partners will continue to be an important part of the real estate strategy, but in the work on a new strategic plan we will also assess the possibilities for a gradually larger element of indirect investments. Indirect investments provide resource-efficient access to specialist expertise and operational capacity that it is not appropriate to build up internally.

As part of the work on adjustments to the real estate strategy, we will also make certain changes to the way we finance such investments. This is described in more detail in section 6 in this letter.

Return differences between listed and unlisted real estate

The Ministry asks Norges Bank to account for why there are differences in the return on the listed and unlisted real estate portfolio. While the unlisted real estate portfolio has been limited to office, retail and logistics, the listed portfolio has had a broader composition, including investments in the residential sector. Given these differences, we do not expect results in listed and unlisted real estate to develop similarly at all times.

Different valuation methods can also in periods give rise to differences in returns between listed and unlisted real estate. Listed real estate investments are priced continuously in the equity market. Unlisted real estate investments are valued by independent third parties through quarterly appraisals. The valuation is based on the property's ongoing rental income, comparable transactions and characteristics such as standard and location. In periods of major market changes, the valuation of listed real estate can change quickly, while the valuation of unlisted real estate may be slower to reflect changes in market conditions. Different leverage can amplify these effects. Listed real estate companies typically have higher leverage than Norges Bank has used in the unlisted portfolio.

In sum, the differences in sector composition, valuation methodology and leverage create variations in return patterns between the listed and unlisted real estate portfolio. In certain periods, such as in 2022 and 2023, these can be significant. In 2022, the listed portfolio had weak returns, while the value of the unlisted portfolio remained stable. In 2023, the value of the unlisted portfolio was written down significantly. The return on the listed portfolio was good in the same period, and contributed to the value of the combined portfolio remaining unchanged.

In discussion note #3 2023²³, we analyse the correlation between the listed and unlisted real estate market and find that this increases the longer the investment horizon. The analyses also show that the correlation with the equity market decreases for both segments over longer horizons. The correlation patterns indicate that the differences between listed and unlisted real estate are short-term and driven by transient factors. In the long term, we therefore expect investments in listed and unlisted real estate to have similar return and risk characteristics, as they provide exposure to the same underlying economic factors.

5. Unlisted renewable energy infrastructure

Strategy for unlisted renewable energy infrastructure

In 2019, the Ministry of Finance opened for Norges Bank to invest up to two per cent of the fund in unlisted renewable energy infrastructure as part of active management. Since 2019, we have approached investment opportunities and built expertise gradually. The first investment was made in 2021. At the end of the third quarter of 2025, we have made 7 investments, primarily direct investments in solar energy and wind power in Europe.²⁴

In the current strategic plan, we have planned to mainly make direct investments in wind power and solar energy, but also to assess fund investments and investments in transmission (grid investments) and storage of energy based on renewable energy sources. In the start-up phase, we have built expertise in direct investments in solar energy and wind power in Europe. This has at the same time resulted in a portfolio that is concentrated geographically and to a few technologies. Going forward, we will emphasise the need for a better diversified portfolio across technologies and geographies, with stable cash flows and limited risk to the invested capital.

We announced our first fund investment in unlisted infrastructure in August 2024. Indirect investments require fewer internal resources than direct investments. Fund investments provide exposure to technologies, regions and parts of the value chain where it is not appropriate to build up internal expertise, and are therefore a good addition to the portfolio of direct investments. We will continue to assess fund investments, among other things as a first step to invest in new markets and technologies, and for opportunities to make co-investments. Fund investments at the same time entail higher costs, which suggests they will constitute a moderate share of the overall portfolio.

Many larger transactions in onshore wind, solar energy, hydropower and grid occur through unlisted companies that own, manage and develop underlying assets. Compared with fund investments, investments through such companies are more cost-

²³ <https://www.nbim.no/en/news-and-insights/publications/discussion-notes/2023/drivers-of-listed-and-unlisted-real-estate-returns/>

²⁴ In the holdings list on Norges Bank Investment Management's website, the investments are distributed by sector and country. The 7 investments therefore appear as 10 holdings on this list.

effective. We will assess investments through unlisted companies to achieve exposure in technologies where the individual assets are relatively small.

Recently, we have expanded the investment department with a view to being able to build up the portfolio in line with the strategic plan. From 1 January 2025, the investment department for unlisted renewable energy infrastructure and the energy department within internal security selection have been organised in the same department under the same manager. This organisation facilitates the exploitation of synergies between the two departments. The goal of the investments is to achieve excess returns.

Results in the management of unlisted renewable energy infrastructure

Since the first infrastructure investment was made in 2021, total return measured against the securities sold to finance the investments has been 5.38 per cent. The return on investments in renewable energy infrastructure consists of an income component and change in the value of the capital²⁵; these amounted to 7.86 per cent and -5.56 per cent respectively over the period. Furthermore, income from power futures, which were used to hedge power price exposure in the investments, made a positive contribution of 1.08 per cent. Transaction costs and currency effects amounted to -0.40 per cent and 0.27 per cent respectively. The return on the financing was -2.67 per cent in the same period. Unlisted renewable energy infrastructure accounted for 0.4 per cent of the fund at the end of the third quarter of 2025.

As for other unlisted investments, there are no continuous market prices for unlisted infrastructure. The valuation of unlisted infrastructure investments is based on, among other things, expected future power prices, expected production volume, cost of capital and the assets' expected life. The valuation involves model-based estimates and assumptions that require a certain element of judgement. Production volume depends, among other things, on weather conditions, and changes can have large impacts on results in the short term. In the period we have invested in unlisted renewable energy infrastructure, there have furthermore been large movements in power prices and cost of capital. This can cause fluctuations in returns that are not necessarily representative of results in the long term.

We still consider the investments to be in a build-up phase where we are harvesting experiences and building expertise. Investments in infrastructure have a long time horizon, and the projects we invest in typically have a life of 25–30 years. The experience from the first years with infrastructure investments has been good. With a relatively short history and limited data basis, it is too early to give a more detailed assessment of the results achieved. The Executive Board follows developments in the

²⁵ The value change reflects depreciation of the capital over time and will therefore often be negative. Infrastructure projects are typically written down to zero, for example over a period of 30 years.

infrastructure portfolio closely and will give more detailed assessments of results when a longer track record is available.

6. Financing of real estate and unlisted infrastructure

In the period 2010–2016, unlisted real estate was part of the benchmark index from the Ministry. When real estate was included in the benchmark index, the fixed income share was reduced correspondingly. Since 2017, the benchmark index has consisted only of equities and fixed income. When the fund invests in unlisted real estate and infrastructure, less must simultaneously be invested in the equities and fixed income included in the benchmark index. Decisions about which equities and fixed income should be sold to finance unlisted investments are delegated to Norges Bank. Financing of unlisted investments is addressed in the management team's investment meeting.

Norges Bank has historically emphasised the diversification characteristics of real estate investments, and has sought to organise the management of real estate and infrastructure investments so that these investments do not change the currency composition, and do not significantly change the market risk in the fund. For unlisted investments not to change the fund's overall currency exposure, they are financed by selling equities and fixed income in the same currency as the investment is made in.

Investments in real estate are financed with a combination of equities and fixed income. The financing of listed real estate investments has had a higher equity share than for unlisted real estate, among other things due to higher leverage. The calculations of equity market risk from unlisted real estate investments are sensitive to data basis and calculation method, and will typically result in a range of possible values.²⁶ Within this range, it will be difficult to give a completely precise answer as to what is the actual equity market risk from real estate investments. The choice of equity share in the financing is therefore to some extent a discretionary assessment.

As part of the work on adjustments to the real estate strategy referred to in section 4, we are also planning to adjust the framework for financing real estate investments. The financing of real estate investments has from 2017, with minor exceptions, had the same equity share regardless of the characteristics of the underlying investments. Going forward, we will establish a more granular framework for financing, where the equity share will be more closely aligned with the underlying risk of each individual real estate investment. Investments in well-established sectors with low vacancy rates will have a lower equity share, while projects with a need for operational involvement, in newer or emerging sectors or with elements of development risk will have a higher equity share. In

²⁶ See also letter to the Ministry of Finance dated 10 October 2016 on new regulation of real estate investments.

addition, we will also take into account the degree of leverage. Through this framework, we will clarify the relationship between risk and financing cost for each investment.²⁷

The equity share in the financing of real estate has historically probably been somewhat high. Given the new framework for financing real estate investments, we expect that the financing going forward will overall have a somewhat lower equity share than today. The total market risk in the fund may thus increase marginally compared with today's level, and the real estate strategy may entail a marginal exposure to general market risk. Market risk from real estate investments will still be constrained by the limit for expected relative volatility.

Direct investments in unlisted renewable energy infrastructure are financed with fixed income. Initially, the cash flow from such investments is often secured through long-term power purchase agreements or government guarantees. After the period with secured prices expires, cash flows may vary with power prices, or new power purchase agreements may be entered into. Although power prices can be volatile, our analyses suggest they are not significantly correlated with the equity market. Indirect investments in unlisted renewable energy infrastructure may, however, entail exposures that suggest the financing should include a certain share of equities.

7. Closing remarks

Norges Bank is satisfied that the returns for the fund overall have been good over time, and that the returns are higher than the benchmark index against which the management is measured. In our assessment, the management has been carried out in a sound manner.

Norges Bank places great emphasis on transparency about the management of the fund. Transparency about historical results can strengthen the ability to stick to long-term strategies, also in periods of market turmoil. Evaluations of historical results also play an important role in the further development of our strategies for managing the fund with the goal of achieving the highest possible return given acceptable risk, within the limits set by the Ministry of Finance.

²⁷ At the meeting on 30 October, the Executive Board decided that the following provision shall be included in Principles for Risk Management in Norges Bank Investment Management: "Norges Bank Investment Management shall establish a framework for deciding the funding of investments in unlisted assets. The framework shall consider the underlying risks of the investment and adjust for leverage. The funding shall be decided before formal approval of unlisted investments."

Yours sincerely,

Ida Wolden Bache

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Enclosures

Enclosure 1: Risk

Enclosure 2: Returns

Enclosure 3: Risk adjustments

Enclosure 4: Costs

Enclosure 5: Value creation from active management

Enclosure 6: Real estate management

Enclosure 7: Management of unlisted renewable energy infrastructure