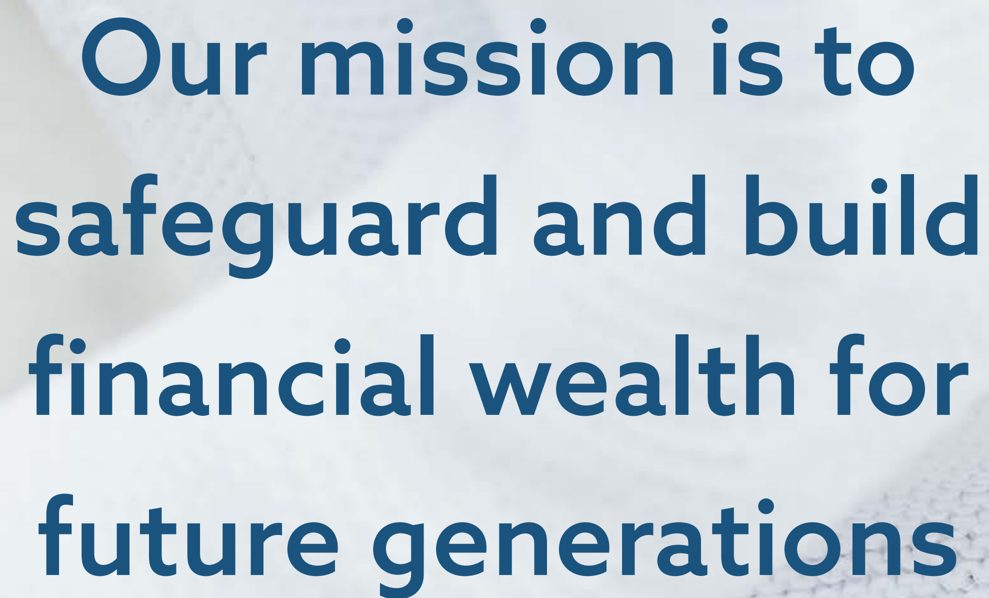
Investing with company insight

Norges Bank Investment Management



Our mission is to safeguard and build financial wealth for future generations

Investing with company insight

The 20-year review

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Knowing our assets

Internal active equity management was launched when we opened our London office in August 2000. Its small size and distance from the central bank fostered a distinct and dedicated investment culture.

In the years that followed, the team became larger and more global with portfolio managers in New York in 2006, Shanghai in 2007 and finally Singapore in 2010. The investment mandates were global, and we wanted to create an international team with a global investment mindset.

The investment philosophy was based on insights from financial theory on efficient markets, systematic risk factors, and diversification in active management. The investment strategy was neither about investing in certain types of companies, nor about investing with a specific investment process. It was rather one of structure – a series of mandates with limited commonality in the investment universe and delegated decision making in individual accounts. The large number of independent, specialised and concentrated mandates has been a hallmark since inception.

The investment approach was simply to trust individual managers to know more about the companies we own, in the long-term interest of the fund. Trust, knowledge and accountability would describe our investment organisation, process and mandates. The trust would be reflected in the delegation of independent investment mandates, the knowledge in the specialist expertise and fundamental insight, and the accountability in the high degree of mandate autonomy.

The sector mandates have always been the core of our company insight strategies. We chose this approach to differentiate our strategy, to specialise for a competitive edge, and to deploy specialist knowledge in a structure with low risk. The strategy was aligned with the ongoing globalisation of industries, delivered significant excess returns, and was a natural complement to an enhanced indexing strategy.

Starting from 2009, we added three specialist strategies targeting capital market transactions, environmental investments and Chinese companies. All had a long-term perspective, spanned different sectors and reflected a significant shift in the world economy. The mandates were not obvious choices at the time but delivered double-digit annual excess returns and provided valuable insight for our other investment strategies.

Company insight is critical in fulfilling our role as a large and long-term owner of companies. In our company interactions, we underline our long-term orientation and our mutual interest in sustainable value creation. Company insight is important for assessing the risk in the fund. Equity investments are the largest part of the fund and contain most of the risk to our future returns. We need to know what we are invested in, and engaging with companies and knowing their business strengthens this assessment. It is also about who we are as an investor. We have a responsibility to future generations. We have built company knowledge to gain the investment insight needed to safeguard our assets for the long term.

Oslo, 22 April 2021

Yngve Slyngstad
Chief Executive Officer
January 2008 – August 2020
Norges Bank Investment Management

Investing with company insight

Internal active equity management enabled us to develop investment strategies tailored to the fund's characteristics. We based our investments on fundamental research into longer-term company developments. This approach was aligned with our role as a large and long-term owner of companies.

The company insight strategies have been based on knowing companies in depth. We have unsurpassed access to company management and conduct more than 3,000 company meetings every year. This is an essential part of our investment process, as companies will have unparalleled knowledge about their industry and markets. We are likely to be a significant owner of most of these companies for decades. Engaging with them helps make the fund a respected and trusted owner.

The sourcing and analysis of information, and the development of investment views based on this, is the essence of the investment process. We have sought to widen our information sources and reduced our reliance on readily available market research. We have built a primary research team and a corporate access team to attain differentiated and targeted information. This information focuses on key value drivers and is aligned with our longer time horizon.

We combined the role of analyst and portfolio manager to ensure that the person with the most knowledge about the company makes the investment decision. The combination of these roles entailed an analytical approach to investing. We recruited analysts who we believed had an investor mindset. Our experience has been that good results follow from having the person with the most knowledge make the investment decision under full individual accountability.

The sector mandates have been the backbone of our security selection strategy. The portfolio managers invest in one industry only across the world. Specialising along industry lines was an efficient way to conduct research. The structure creates individual specialist insight into a limited number of comparable companies that are followed over time.

We have funded a large number of mandates each with a small number of investments, rather than vice versa. Concentrated portfolios should ensure that the holdings are understood in depth. The strategy was set up as a series of independent mandates that would be funded with slices of our index portfolio. The sector strategy was sector-neutral by design with a relatively low investment risk. The large number of mandates would also increase our overall investment capacity.

The company insight strategies are aligned with the overall interests of the fund. We have focused on large companies, and have had an emphasis on our European holdings. These constitute a large part of the fund's investments, and knowing them well is also important for our ownership role and risk management. This approach has supported the fund's interests and built trust around our investment activities.

Oslo, 22 April 2021

Petter Johnsen
Chief Equities Officer
Norges Bank Investment Management

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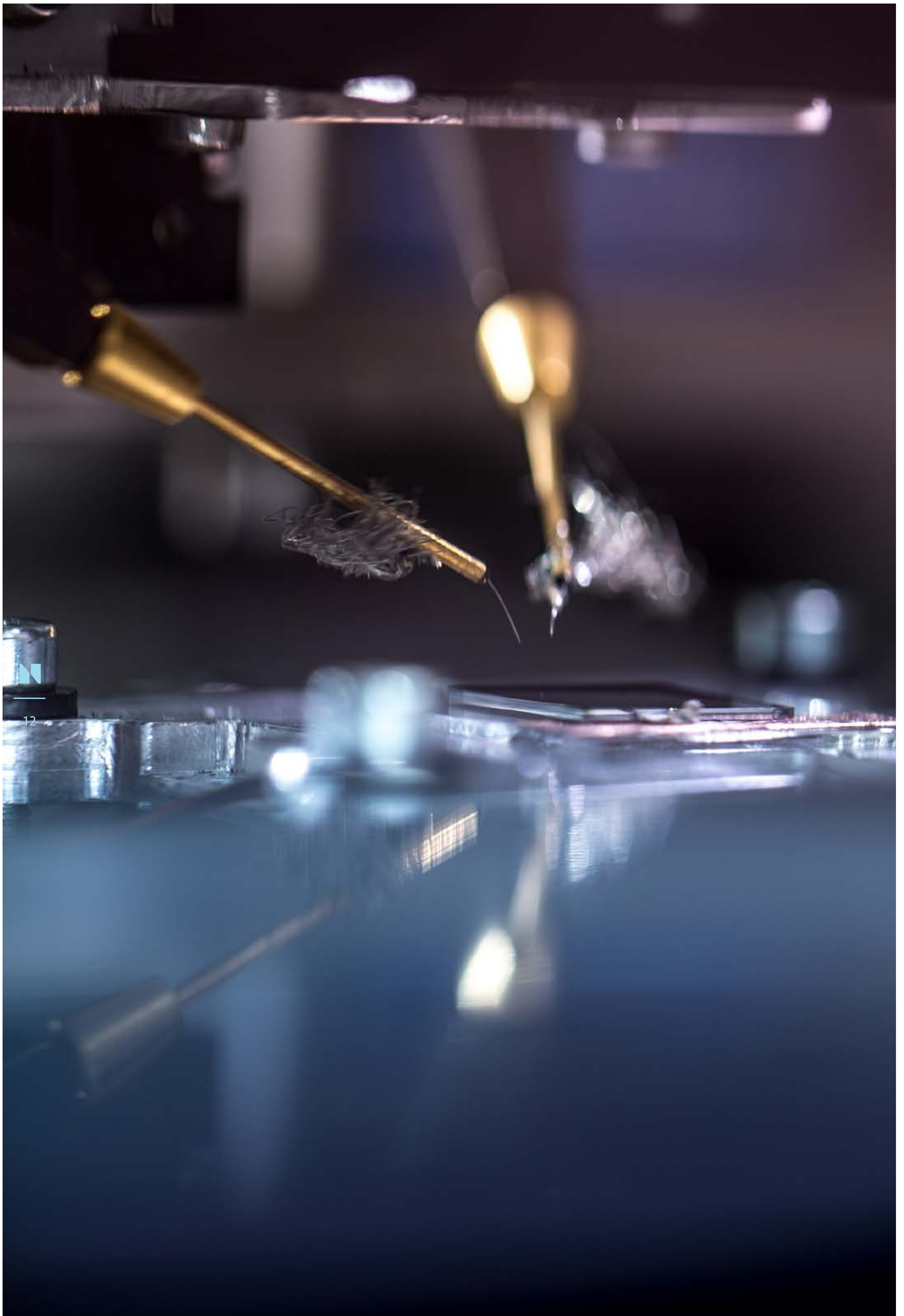
The investment strategy

We started to invest in equities in January 1998. The fund had been split from the currency reserves at the beginning of the year, and an organisation to manage the fund was formed.

The central bank had long experience of investing in government bonds, but the equity asset class was new. We were starting from scratch, with limited experience and without fund management systems or operations. All equity assets were therefore managed initially by external managers.

All equity holdings were managed externally throughout 1998 and the first half of 1999. In the first five months of 1998, we implemented a 40 percent equity allocation in the fund through funding of external index managers. In the second half of 1998, we searched for, and by year-end funded, the first external active managers.

We did not intend to rely on external managers. Throughout 1999, we prepared for internal equity management and established systems, internal operations and an outsourced back-office solution. We needed to build our own capabilities in core areas such as portfolio management and trading. The internal fund management expertise would improve all other aspects of our management and improve the handling of our relationship with trade counterparties, external fund managers, custodians and fund management service providers.



The strategies

The company insight strategies were based on knowing companies in depth. To this end, we specialised our industry research to know more about the long-term sustainable value creation of the companies we invested in.

The strategy inception
Internal active equity management would enable us to develop investment strategies tailored to the fund's characteristics, its long-term horizon and its high level of transparency and cost-consciousness. To the academic debate, we gave an organisational answer. To the question of structure, we chose a global industry division. To extend the strategy, we selected a few selective and complementary areas.

The academic debate – an organisational answer

The central bank questioned whether it was at all realistic to expect a better return than the market through active equity management. In the academic field of financial economics, the efficient market hypothesis states that asset prices fully reflect all available information. Accordingly, it is not possible to exceed the market return on a sustainable basis, at least not without taking on additional risk.

We took the starting point that real financial markets were generally efficient. This had important implications for the fund's overall investment strategy. However, academics had noted that the information dissemination and consequent efficiency of real financial markets were not fully described by this simple concept. Academia argued that, since obtaining relevant information is costly, there must be some reward for collecting and processing it. Some investors would be better at collecting and processing information than others and would exploit informational inefficiencies to achieve a better return than the market and recapture their costs. This reasoning licensed the funding of our first active external mandates in 1998.

The question was then whether a central bank could become such an investor. Residing in a public institution with barriers to remuneration, lacking experience, and being located on the periphery of global financial markets, was not the ideal starting point. The central bank had an organisational culture that differed from the fund management industry, and the concept of investment risk required some translation. The central bank's role was to provide monetary stability, not to make money. On the other hand, we had the opportunity to start from scratch and develop a strategy and an organisation that differed from conventional market practice. With no need to attract funds, we did not need to adapt to customer preferences.

Ultimately, we needed to build a good organisation. The aim of our investment strategies would be to increase the return on the fund, but just as important as the financial gains were the organisational consequences. Every part of the organisation would perform better if we set our sights high. Aiming for the average would be to guarantee mediocrity, as the Bank's governor put it. Internal active management with the ambition to achieve better returns than the market was seen as an organisational necessity to succeed in asset management within a public institution that did not have to prove itself by attracting funds from customers. The very fact that we had a large

public fund with assured assets, gave us a licence to venture into internal active management.

The sector mandates – an industry division

In the late 1990s, most investment products would invest across all industries within a geographical area, most often a country. The portfolio managers were usually supported by several analysts, who each covered a narrower part of the investment area. We purposely organised ourselves in a different way by setting up the sector mandates strategy. The portfolio managers would not invest in every type of company within a certain geography, but rather make investments in one industry only across the world.

The strong trend of globalisation of industries at the time was an important factor in our decision to set up global industry mandates. It was also a trend we tried to analyse and benefit from. Equity markets, though, were still to a large extent segmented by country. In some ways, the world's industries became global before the investment world did. We believed this segmentation would create opportunities for exploiting pricing anomalies. The portfolio manager would try to identify and buy attractive companies within an industry, and sell relatively poor investments in the same industry, across global financial markets.

Specialising along industry lines was an efficient way to conduct research. We sought the skill that this specialisation would give. Companies that belonged to the same industry tended to have more in common than companies that belonged to the same country. This was especially true for the larger companies, which were becoming more international and less dependent on their home market. The tailored funding also meant that, rather than research and select companies in all industries, we could focus only on the sectors where we thought we could develop a competitive advantage and where the probability of outperformance would be highest.

Another important aspect of the sector strategy was that the investment professional who had conducted the research made the investment decisions. The person with the deepest company insight did not need to convey research or insight to a portfolio manager or to an investment committee before an investment decision could be made. We thought that information and nuances could be lost in the process. The delegation was clear and the independence in investment decisions strong. The combination of the portfolio manager and analyst roles also ensured that there would be no doubt in retrospect about who had been responsible for what. Full accountability went hand in hand with wide discretion to make investment decisions.

The company investments in the sector mandates would be funded by selling companies in the same industry from our index portfolios. The strategy was therefore sector-neutral by design. This would entail a relatively low investment risk for the combined set of mandates. The risk of significant underperformance would be low, but the potential for outperformance would also be limited. This was at the time a necessity given the question marks regarding active management and research-based security selection in the fund. The sector strategy was a natural complement to an enhanced indexing strategy. The independence of the investment process across sectors would also diversify the investment result over time, and thus further reduce the risk of underperformance in a single year. The strategy was not set up to maximise excess returns, but rather to limit the probability of significant value detraction.

We had, in other words, at least four reasons for selecting the sector mandate approach. We wanted an approach that would differentiate our strategy from, and get a different angle to, other market participants. We latched onto the ongoing globalisation of industries, staying with the trend while crossing geographies to exploit market segmentation. We focused on single industries to develop skills and choose the set of industries where we could develop a competitive advantage. And last, we chose a risk-contained strategy that did not try to select the better industries, while we delegated individual and independent mandates to diversify and ensure accountability.

The specialist mandates – a selective extension

The years following the financial crisis in 2008 were a period both of change and of consolidation in how we invested in companies. The fund's equity portfolio had grown very large following years of significant inflows, a shift to a higher equity share in the fund, and large purchases of equities during the financial crisis. We had gone through our first full decade of company insight investing, and we considered a reset and rescaling given our vastly larger assets. The sector strategy was realigned to encourage more long-term position taking, and to better enable us to fulfil the fund's more prominent ownership role.

Starting from 2009, we developed additional strategies based on fundamental company research. These too were based on an attempt to earn excess returns through deep company insight, by being better at gathering and processing information on companies and industries. The additional strategies were our capital mandates, environmental mandates and domestic China A-share mandates. The variations in the investment universe or in the research process still made these distinct strategies. They were set up to complement our sector strategies, not to compete with or replace them. We started to build organisational capacity outside our sector strategies to keep the sector strategy team focused without too large an organisational structure.

The new capital mandates strategy was the one most closely linked to the greatly increased size of the equity assets in the fund. While the sector mandates produced good results, we believed that there were investment opportunities that were difficult to exploit within this strategy. The capital mandates strategy formally started up in December 2010. The intention was to take large long-term positions in single companies across sectors. Taking part in large capital market transactions was an integrated part of the strategy.

We said at the time that we had four investment targets for this strategy. The opportunity to scale for larger company investments, and the opportunity to participate more actively in special situations and capital market placements, were the two most obvious. In addition, we wanted an opening for investing in companies outside clear sector definitions, especially at a time when traditional industries were mutating. And last, we wanted to delve deep into industry trends that crossed sectors.

The environmental mandates we funded in December 2009 had a different starting point. The Norwegian government had initiated a broad public evaluation of the fund's ethical guidelines and concluded that it would consider a separate allocation to environmental investments. Positive security selection in listed equity markets emerged as the preferred direction. The environmental theme, and in particular emerging climate concerns and the

potential for a full-fledged energy transition, was in any case an interesting professional angle for our company insight investments. The research format would have to be different, with more work on long-term trends, emerging technologies and industry disruptions. The investments would cross many sectors and would not fit neatly into our sector strategy setup.

We had several considerations to address when we established this as a new strategy. A dedicated allocation in the mandate would require separate reporting, and we had to be prepared for a different level of public scrutiny given the political nature of the allocation. Furthermore, an environmental mandate would most likely change over time and include more asset classes. In addition, the common investment theme in the form of an industry-wide decades-long megatrend would require a different type and format of research. And last, the investments would span different sectors across our industry division.

The new China mandates were not directly linked to the much larger size of the fund, or changes to our mandate. That said, the larger fund made the strategy more feasible, and it was likely that the fund benchmark would include domestically listed Chinese companies in the future. By year-end 2011, we had set up an investment team at our Shanghai office to manage the internal part of our equity allocation to China based on fundamental research including company meetings. The Shanghai office now had portfolio managers for our enhanced indexing, external mandates and internal active mandate strategies.

The China mandates had a long-term and strategic perspective. The Chinese economy would influence all global companies, and an insight into the larger Chinese companies would give us an insight into many of the competitors and the customers of the multinational companies headquartered in other countries. The new China economy would also make us attentive to new emerging industry trends. There would be obvious knowledge synergies between the research here and for our other investments. Furthermore, the size of the domestic equity market would be large enough to make a difference, and the potential for value creation would be considerable. The research needed would be different, and the language requirements were definite. Company information and business practices would require a strong local presence, as the country factor would dominate in many industries and areas. And finally, the market was in some respects immature, and while this would create investment opportunities and mispricing, it would also lay bare some market information and corporate governance issues.

All three specialist strategies crossed industries, but they were still distinct. One focused on the opportunity to run larger positions and the intrinsic equity capital market mechanism, another on a theme that could turn out to be a significant disrupting trend, and one was driven by the macroeconomic growth and emergence of a dominant country. In one sense, they all catered to significant economic developments– in the world's financial markets, in the world's energy market transition and in the world's economic and political balance. These major developments led us to establish the additional specialist mandates.

The investment strategies
The sector strategy has been the backbone of our security selection based on company insight. The strategy was developed and tested in adverse market conditions during the first ten years. After a decade of sector investing, we decided to start up several new investment strategies. The larger fund warranted a set of more diversified and specialised investment strategies. We would go on to scale the number of mandates and expand the combination of approaches.

The sector mandates
The sector mandates strategy started up in earnest in 2000 and has been at the core of our company insight investments ever since. While we have continued to develop the strategy, its foundations have remained the same for the last two decades. The steps we have taken as we built the strategy during this time could be described as four five-year periods in which we respectively established, developed, reset and consolidated the strategy.

The strategy began with small steps taken in 1999 with an Oslo-based investment team that was small and not very experienced. The first big step was when we opened a London office in August 2000 and the five portfolio managers moved there. We established the London office to be closer to global markets. The small size of the office, and the distance from the central bank in Oslo, were helpful in creating a well-defined investment culture. The investment mandates were global, and we wanted to create an international team with a global mindset.

The first five years were a period of rapid growth and continuous adaptation of the investment strategy. We used the first five years to establish the strategy, and we were prepared for variation in performance as we recruited portfolio managers and shaped the investment process.

In the second five-year period, we opened additional international offices and spread the team to diverse locations – New York in 2006, Shanghai in 2007 and finally Singapore in 2010. In September 2008, the global financial crisis erupted. The sector mandates were not well positioned for the initial share price movements. Even so, the strategy was maintained, and performance rebounded in 2009.

By 2010, the fund had become a large stakeholder and a top ten owner in many companies. We decided to realign the investment strategy given our large equity holdings and our increased ownership responsibilities. We wanted to emphasise a long-term approach to company research and the fulfilment of our ownership role. We would go on to reset and refine our research and investment process in this third five-year period.

The last five years have been a period of strategy consolidation. We have also seen significant growth in assets over the last couple of years. We have extended our coverage to cover the sectors more fully and expanded our information sources. While the first decade could be described as a decade of rapid growth in people, locations and coverage, the second has been a decade of consolidation and improvement of our investment process.

We decided to concentrate initially on a limited number of sectors. The first out were banking, insurance, retail, media and telecommunications. By 2007, we had expanded our coverage to also include oil companies, utilities, basic materials, capital goods and consumer staples. Later, we expanded our coverage in the technology sector, and finally added health care in 2015. While in the first decade we chose sectors where we could establish a competitive advantage, we now covered all major industries. This reflected

our increased ownership role and the need to cover all our major investments for risk assessment purposes.

The size of a sector strategy team was driven more by the extension of company coverage than by the size of the assets. The first decade therefore saw a rapid expansion of the size of the teams. In addition to the five portfolio managers we sent to London in 2000, we expanded the teams with ten more over the next five years, and then a further ten in the five years after that. In the second decade, the team increased from 25 to 30 portfolio managers by 2015, following the extension of our sector coverage.

The assets, while insignificant early on, grew to 15 billion dollars in 2005, and then to 40 billion dollars at the end of 2010. In the second decade, assets at first grew quite modestly, increasing to 50 billion dollars in 2013 and 60 billion dollars in 2016. In the last two years of the decade, we increased assets in the sector strategy significantly to 100 billion dollars at the end of 2020.

At the end of 2020, there were 30 specialist sector portfolio managers and a small number of analysts, organised into seven teams covering all major industries. The portfolio managers all ran independent investment accounts with clearly defined investment mandates. The research covered around 600 large companies in developed markets representing 52 percent of the fund's equity benchmark index. The portfolio managers had invested 889 billion kroner, or just above 100 billion dollars, which was 11 percent of the fund's equity investments, in somewhat more than 600 companies.

The capital mandates

The capital mandates were purposely named with a double meaning. We would commit long-term capital and engage more as owners, and we would be more involved in the capital markets when companies needed new or additional capital.

We are a large, global investor with a long investment horizon and limited liquidity needs. As the fund had grown, we thought that these characteristics were not fully exploited by running only a sector mandates strategy. The new capital mandates strategy would take long-term positions based on cross-sector research, make large investments in special situations, and participate in capital market transactions.

Large capital market transactions were a focus for the capital mandates from the beginning. This could be a capital placement, changes to the capital structure, or an investment in a company being listed or planning to be listed. The fund's size, long-term horizon and limited liquidity needs would fit well with a role as an anchor investor. Initially, the capital market strategy would focus on large transactions, but from 2014 we established mandates that would consider a wider range of opportunities in different geographies.

We needed a different research approach and capacity for cross-sector and capital market investment decisions. When taking part in large capital market transactions, we needed to mobilise substantial research resources for a limited period. The research was also different in that we aimed to identify long-term structural trends and potential disruptions. Analysts with different sector and geographical expertise worked together conducting special situation and wider industry research. We rapidly built out the research team to attain this capacity to identify and evaluate investment opportunities swiftly and thoroughly.

Experience with the capital mandates in the first five years showed that we had to expect large variations in return. We made several good investments in 2012 and 2013, but the portfolio had a challenging year in 2014. Large ownership stakes in single stocks created a different level of public attention, and this led to some debate. In 2015, we made some changes to the capital mandates strategy. We increased the emphasis on capital market transactions and continued a cross-sector strategy with a lower volatility of returns.

At the end of 2020, six portfolio managers and analysts worked on the capital mandates. Between them, they managed 80 billion kroner in equity investments.

The environmental mandates

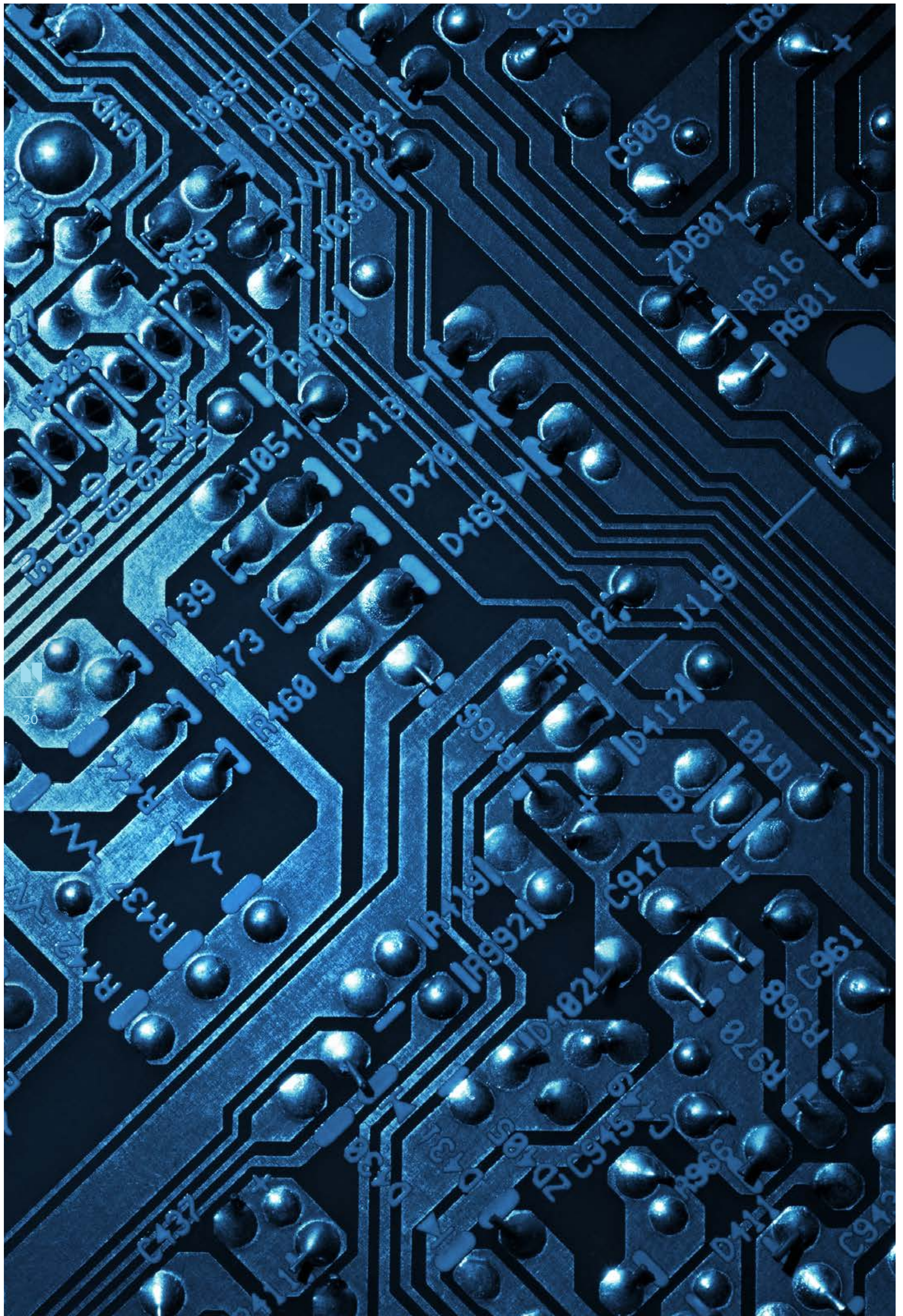
In December 2009, we established our first internal environmental mandates, one focusing on clean energy and renewable energy equipment and another on water and waste management. The first environmental mandates built on our experience with the sector mandates, and the portfolios were managed by the portfolio managers in our utilities sector team. The mandates were initiated at a time when the overall environmental profile of the fund was being discussed.

Environment-related investments were included as a requirement in the mandate for the fund from the end of June 2012. The Ministry of Finance stated that investments under an environment-related programme should "yield indisputable environmental benefits, such as climate-friendly energy, improving energy efficiency, carbon capture and storage, water technology and management of waste and pollution", and deliver at least the same return as the fund overall. The minimum allocation was set at 20 billion kroner. From December 2019, this allocation included investments in unlisted renewable infrastructure.

The environmental mandates would predominantly invest in companies likely to benefit from the transition towards lower emissions and a greener economy. This required in-depth industry and technology knowledge as we attempted to identify future trends. The companies would be exposed to disruptive technologies, new market entrants and changes to regulation and policy. The investments would be in environmentally friendly solutions rather than in an industry. In practice, the portfolio managers would need to continuously define and adapt their investment universe, as the types of activities that would qualify as environmental would be a matter of judgement. This was a key difference from the sector mandates.

We set up a separate environmental team in the beginning of 2011. Over the years, we added investment professionals with an industry background in renewable energy and battery technology. The environmental strategy was oriented towards a theme that affected many of the companies that the sector strategy covered. There was always a high degree of collaboration with the sector portfolio managers who cover relevant companies. As the scale of the energy transition expanded, we again combined the environmental team with the utilities and oil sector teams to capture the changes on the way in the full energy complex.

The environmental team consisted of five portfolio managers and one analyst at the end of 2020. The team managed 99 billion kroner in listed equities. The portfolios were invested in 90 companies out of around 140 companies that we have defined as our environmental investment universe.



The China mandates

The domestic Chinese stock market was closed from 1949 until it reopened at the end of 1990 with the listing of eight stocks. Over the last three decades, the China A market has grown to be the world's second-largest with a total market capitalisation of over 10 trillion dollars and close to 4,000 listed companies at the end of 2020.

In 2005, we decided to set up an office in Shanghai. The reason for setting up the office in China was a recognition that the country was becoming very important for many large companies listed in the rest of the world. It was essential to have a good understanding of the Chinese economy and society, and we thought its importance would increase rapidly over time. The Shanghai office was not an obvious choice at the time, but we decided to take the long view. The first portfolio managers moved to Shanghai in August 2006, but the office was not formally opened until November 2007. By that time, there were approximately 1,500 companies listed in the domestic market.

By the end of 2011, we had established a dedicated team in our Shanghai office to manage part of our domestic China investments. While the other company insight strategies were global in nature, the China mandates would invest mainly in companies headquartered in China and listed on the local exchanges. The research required a different format than for our other investment strategies. The information sources were different and at times needed verification. In addition, interaction with management in the companies we invest in is central to our investment approach. A dedicated team in China would understand the language and the local culture and represent the fund in a good way in company meetings where management teams would speak Mandarin with investors.

We expanded the team in 2013 to allow the portfolio managers to concentrate on a few sectors. We also narrowed the investment universe to cover the top 200 companies in terms of size to allow for in-depth fundamental research of a select list of companies on an ongoing basis. This moved the investment approach closer to the model used in our sector mandates and allowed more interaction with the sector strategy.

The domestic China holdings were an active allocation by the fund, and the asset size available for the internal active team to manage was limited by this allocation. To better utilise the insights of the team, the investment universe was expanded to include Chinese companies listed offshore, initially in Hong Kong and later in the US. Starting from June 2019, the fund benchmark would gradually include domestically listed Chinese companies. The fund's investments in China A shares were now set to increase.

The Chinese stock market has turned out to be a fertile area for active management. Having our own portfolio managers on the ground with local knowledge and company expertise has created significant excess returns. It has also provided valuable insight for our investments in global companies in our other investment strategies.

At the end of 2020, the China team consisted of five portfolio managers who managed 54 billion kroner invested in 194 Chinese companies. Their combined research list was made up of 280 companies listed across several stock exchanges. The investment strategy has given the fund a valuable understanding of the importance of China for the fund and our future investments, as well as our risk management and governance strategies.

The approach

The strategy was set up as a series of independent mandates that would be funded by slices of our index portfolio. We aimed for company insight through fundamental in-depth industry research.

The investment approach was simply to trust individual managers to know more about companies to invest for the longer-term benefit of the fund. Trust, knowledge and accountability were key elements. They would respectively describe our investment organisation, investment process and investment mandates, and are set out in the sections that follow.

The trust would be reflected in the delegation of investment responsibility to individuals who would be given considerable independence and be accountable for their individual results. The academic foundation of the strategy was combined with a keen orientation towards the human factor and attracting people with an investor mindset who would fit into the organisation.

The company knowledge would be specialised and built through in-depth research on a selective list of companies. The research would be directed towards the companies where we had a long investment horizon and large ownership stakes. We sought to know more about their business and the value chain that they were a part of, and we would emphasise our mutual interest in long-term profitable value creation through our interest in actual business issues.

The investment approach would be reflected in a set of detailed investment mandates. The mandates would outline where and how the portfolio manager could invest, and how the investment returns would be measured. In other words, the investment universe, investment benchmark and investment restrictions for the investment activity. We would invest in line with the fund's long-term interests.

The investment setting

We increased the range of investment decisions through many separate mandates. We also ensured independence of investment decisions and ownership of the investment process.

The design of the overall strategy was based on some simple academic insights. We would diversify our investments in a set of strategies that had numerous independent investment positions. This should result in a high excess return relative to the capital at risk. In financial terminology, we sought to attain a high information ratio for the combined investment strategy.

The investment structure would be a series of carefully delineated mandates with limited commonality in the investment universe. Within this structure, we would trust our portfolio managers to create excess returns through delegated decision making in individual accounts.

The investment foundation – an academic starting point

The early foundations for the investment strategy were to a large extent imported from financial theory. Broadly accepted academic insights were considered a common and objective foundation – an obvious advantage for a fund saving for a whole nation.

This starting point influenced the design of the overall equity management strategy. Three insights from financial theory were particularly important. The theory and refinement of the efficient market notion were an important

foundation, the work on systematic risk factors in the equity market a good second, while insight into diversification in active management was our third baseline.

The efficient market hypothesis (EMH), first put forward by the father of modern financial theory Eugene Fama in 1970, was the guiding principle behind the fund leaning towards index management. At the start, however, we explained this starting point mostly in terms of the desire for diversification. We simply stated that we would buy a slice of the world's financial markets, or at least the part that was easily traded through public markets and listed on exchanges. An equal level of ownership of all listed companies would follow, and in practice be very close to an index management strategy.

The refined understanding of the efficient market hypothesis opened for some important deviations from a simple index management strategy. First, some non-informational aspects intrinsic to the financial market mechanism could be exploited. The consequence was our heavy emphasis on so-called "enhanced indexing". Second, areas of the investment universe such as small companies and smaller emerging markets had information dissemination weaknesses and were often not well covered by standard index construction methodologies. This would warrant a more active security selection strategy, and we funded external mandates in emerging markets and smaller companies in Europe and Asia. Third, the trade cost and market impact aspect of investing was at times left out of academic theory, while we emphasised trading and lending of securities. Finally, the thinking around efficient markets and index management was important when we developed the internal active strategies as well. In real markets, it was likely that some investors would be better at collecting and processing information than others. The active strategies were a complement to a base of enhanced index management. In many ways, they would be a part of an overall "index-plus" strategy.

The second foundational insight was derived from the academic work on drivers of the returns in the equity markets, referred to as systematic risk factors. The three-factor model, first outlined by Kenneth French and Eugene Fama in 1993, had market exposure, valuation and size of companies as the main drivers. We got hold of a very large data set on returns of actual funds through our custodian. The data showed that the sector deviations of actual portfolios was a significant driver of differences in relative returns, and these would encompass a large part of the model's three systematic factor exposures. In other words, if you really wanted to reduce your exposure to systematic risk factors, and consequent time variation in relative return, the thinking and method around sector deviation would be important. The sector strategy we implemented was to a large extent an answer to this, as the strategy would be sector-neutral by design.

The third element was the insight from the so-called "fundamental law of active management". This theory influenced the actual combination of the parts of the overall internal active equity management. The "fundamental law" of asset management, despite its grand name, conveyed a simple insight. It was first formulated by Richard C. Grinold in an article in 1989. It states that the productivity of an active manager is a function of skill and breadth. Skill is the ability to forecast returns, while breadth is the square root of the number of times it is utilised. This was expressed by the so-called "information ratio" – the ratio between the relative return and the standard deviation of the relative return. Crucially, independent investment decisions

add much more to breadth than investment decisions that are somehow connected. The thinking around investment strategies when we started was stated in similar terms. Later, we adopted the theory and explained the strategies with the vocabulary of this simple concept.

The academic bent of the strategy led to some comments about "textbook management" in the first few years. Later, after the financial crisis in 2008 when the relative return had lagged the fund benchmark, the questions around the academic theory behind active fund management again surfaced. The call was once more for passive index management of the fund, usually with a confident backdrop from the theory of efficient markets. In some ways this was surprising, as the experience from the financial crisis was not by any means that markets were efficient.

The investment structure – a series of mandates

The investment strategy for the fund was based on diversification. A large number of internal and external concentrated and specialised mandates have been the hallmark of our investment strategy since inception. We wanted a set of different investment strategies, and we wanted the majority of these to have a variety of investment positions. The different investment styles and approaches should all be based on specialist expertise.

These were the elements of the fundamental law of active management. We sought to build adequate skill to achieve outperformance, and a structure with the breadth of many independent investment positions. The company insight strategies sought to develop investment skill through fundamental company insight. The breadth would come from numerous and independent investment mandates.

The company insight strategies would ensure a high number of independent positions through many independent mandates, rather than many single investments by each portfolio manager. Too many investments would reduce the time spent on each of them, and less insight could reduce the skill. We would prefer concentrated positions in fewer companies to ensure that the companies were understood in depth and the investment ideas fully explored.

The investment objective was not to maximise the information ratio for every mandate. Although interesting for an evaluation of the statistical properties of the mandates, and the probability of skill rather than luck, this was not the target. We would rather consider the individual mandates' contribution to risk for the combined equity strategy. The relevant risk to manage was the incremental value at risk for the total fund.

A consequence of this was that the individual mandates did not need to be balanced in style, nor did we need to hedge the risk profile at the individual mandate level. We believed this would further increase the degrees of freedom and thus the investment independence and conviction of the individual portfolio managers. Given the strategy design and the diversified nature of the fund, the incremental risk would be small for most additional mandates.

The high number of mandates also increased our investment capacity. The many positions led to diversification and lower ownership stakes, and as a consequence less market impact when implementing investment views through trading. The structure was somewhat more complex to fund and rebalance, and thus would increase the demands on operations and risk management.

The investment accounts – delegation and independence

The concept of an investment mandate has been central to how assets are managed in the fund. An investment mandate is a delegation of authority to a portfolio manager or investment committee to invest assets within a certain area and using certain instruments. Each mandate in our structure was attached to a separate securities account and was a formal document setting out the investment objectives and restrictions.

The mandates gave a single portfolio manager full discretion for investment decisions within a set of restrictions. The investment mandates would specify where the manager could invest and how the results would be measured, in other words the investment universe and the benchmark. The mandate would also define what would be an acceptable risk level and specify any investment restrictions. The investment results would be evaluated relative to the benchmark that the mandate specified, and investment decisions and risk would be monitored in relation to the mandate.

We believed that doing things differently from standard market practice would increase our chances of outperformance. Rather than doing the same as others better, we aimed for investing better by choosing a different way. With the independence the portfolio managers were given, the mandates would be an important management tool. It was important that mandate design was based on fund characteristics, to ensure that the strategy could be implemented in an effective way for the fund and contribute to a differentiated investment strategy.

The single mandates followed a set structure and were kept simple. We decided to issue tailored and well-defined mandates using simple instruments, within industries rather than geographies, and only in the areas of the investment universe where we wanted to be active. In other words, a number of simple and targeted investment delegations.

The fundamental law of active management also guided the early deliberations around mandate design and allocation. We wanted the accounts to be fully invested with few common risk factors across the portfolios. We sought to reduce exposure to common elements such as market direction, foreign exchange, systematic risk, and trending themes, as these could well collapse the number of truly independent positions. We would specify and scale the individual investment mandates to achieve our overall investment profile.

With a large number of more specialised mandates, instead of a limited number of generalist mandates, we expected that investment decisions would be more independent, hence increasing the breadth of the decision making. The investment mandates outlined our strategy design and remained durable through the years.

The investment organisation

We designed the investment role and investment organisation to concentrate exclusively on investing. We sought autonomy and accountability in the portfolio manager role, and an organisation with strong teams and shared values.

We would define the investment role to achieve a sole focus on investment. We would combine the role of analyst and portfolio manager. The design of the role and the clear measurement of results would ensure full accountability. We would give our portfolio managers a high degree of independence and extensive autonomy.

To make this work, we recruited professionals who would thrive in this setting. We would look for people with an investor mindset and allow them to develop their professional skills and fine-tune their investment process over time.

From day one, we would give individuals an unusual degree of freedom both in the investment process and in investment decisions. Our experience has been that good investment results are associated with having the person with the deepest knowledge make the investment decisions with an undivided investment focus and full individual accountability.

The company insight strategy was built by outstanding professionals and strong-minded investors who would continuously strive to improve their investment process. The investment culture was characterised by a collegial atmosphere of friendly competition. An organisation that was built for independence and autonomy ended up with strong teams with shared values and a clear and distinct investment culture.

The investment role – accountability and autonomy

The traditional role division in fund management organisations could be described as a triangle representing the analysts, portfolio managers and traders. The analyst will conduct the investment research, the portfolio manager will make the investment decision, and the trader will execute them. We decided to break the triangle by combining the analyst and portfolio manager roles while at the same time giving the trader more control and ownership of the trading activity.

The point of combining the role of analyst and portfolio manager was to ensure that the person with the most knowledge about the company made the investment decision. With specialised and narrow mandates and limited interest in top-down calls on the economy or the markets, we would keep an analytical approach to investing through the combination of these two roles.

The idea behind the larger role for the trader was to reduce the portfolio manager's interest in short-term price moves in the market. We tried to shelter our portfolio managers from market noise so they could focus on long-term fundamental research. We developed an internal and instant pricing procedure where the trader would give the portfolio manager a firm price for the full block of shares to be traded. In turn, the traders were responsible for managing the risk of our combined trading activity. The result was more patient trading and use of internal crossing opportunities, both elements contributing to lower market impact and trade cost.

The portfolio managers would focus on investing and not spend time on management, operations, marketing or trading. Many fund managers at the time would spend considerable time marketing their fund and directing their

traders. The idea we had was to strip the role down to investing only. This was attractive to professionals who cared about investing.

The combination of the roles of analyst and portfolio manager should ensure that information, nuances and instincts would not be lost in translation. The role combination made internal marketing of ideas redundant and ensured that there would be no doubt about who had been responsible for the investment outcome. The individual mandates had objective, clear and detailed benchmarks that allowed real-time measurement of mandate performance and investment decisions. The two elements together led to clear responsibility and accountability. This enabled the wide discretion in decision making.

From the start, we wanted to give the portfolio managers considerable autonomy. They would manage their portfolios as they saw fit within their investment mandate and shape their own investment process. The research would involve a series of skillsets, from building financial models to getting the most out of company meetings. The idea was to let everyone use the best of their abilities and tailor their work to their competitive strengths. The autonomy should ideally both improve investment results and ensure a diversity and diversification of approaches. This would also be aligned with the fundamental law's notions on skill and independence of investment positions.

Investment mindset – conviction and revision

Investment management is a competitive field where the quality of the portfolio managers will have a large impact on the potential for excess return. Recruiting, developing and retaining outstanding investment professionals would be essential for investment outperformance.

Assessing who could fill a combined analyst and portfolio manager role, both researching companies and making investment decisions, was crucial. Evaluating analytical skills was less of a challenge than assessing investment skills. We would look for people with convictions and independence of mind, where this was combined with a willingness to revise when faced with new information or insights.

We still find it difficult to pinpoint exactly what makes a good investor, but our experience has been that strong results follow from investment views and approaches that are distinct and directed towards the key issues regarding an investment. The managers had to be confident while at the same time aware of everything they did not know. They had to be willing to take investment risk and recognise and learn from mistakes. Their personalities had elements of being curious and critical at the same time.

Weaker results would be associated with a lack of an investment edge. We would be concerned when the analytical work was lacking, where there was a limited understanding of own strengths and weaknesses, where we saw a struggle to generate truly differentiated investment views, and where there was a lack of willingness to implement investment views with conviction in order to achieve substantial outperformance.

The essence for us would be the trust we gave our people to manage large amounts of assets on behalf of the fund with an unusual degree of investment autonomy. Given the large assets in a mandate and the possibility for the portfolio manager to shape their own invest process the integrity of the investment professional would need to be unquestionable. The fund's interest should always come first.

The investment teams – culture and values

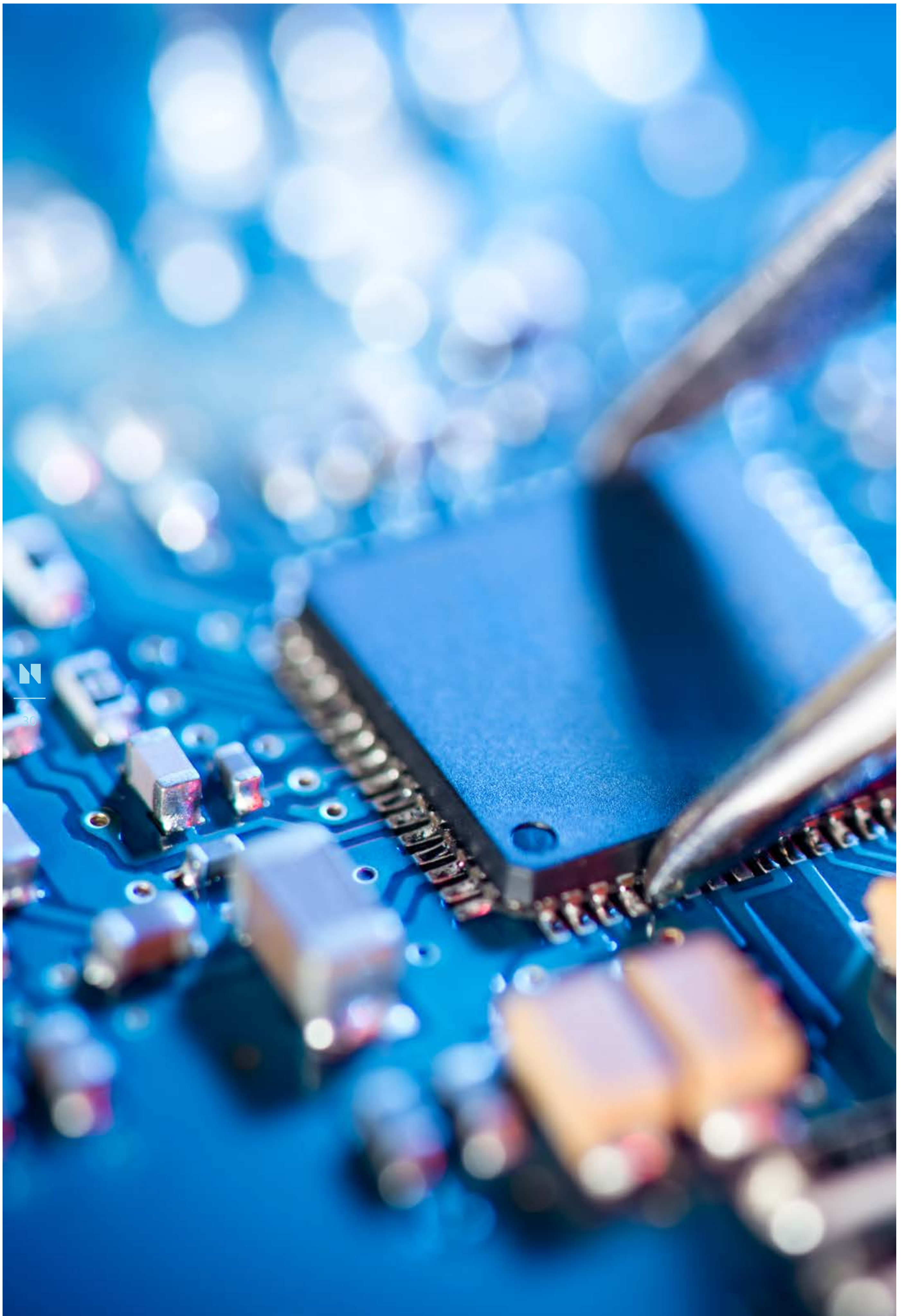
The portfolio managers enjoyed a large degree of autonomy, but we also wanted them to learn from other portfolio managers and to contribute to the wider investment organisation. Having portfolio managers work together in teams was the idea right from the beginning. Each portfolio manager would have their own portfolio and make independent investment decisions, while at the same time benefiting from discussing investment ideas and sharing insights and expertise. Responsibility for different companies was divided among team members, although there would usually be some overlap to encourage interaction.

An important challenge was to find the right balance between individual autonomy in the investment process and the development of independent views, while at the same time belonging to teams and learning from colleagues. The common research format we eventually developed was an attempt to create a common discussion platform, not a common knowledge base.

We also wanted our portfolio managers to interact with investment professionals outside their own teams. The economic value chains would typically extend across industries and team divisions. From 2014, we also integrated our management of corporate bonds with the equity area. The managers would attend meetings with companies together and share their research insights. Avoiding downside risk will be the principal interest when you manage credit risk. This led to a keen interest in the balance sheets of companies, and a different starting point when discussing companies, valuation views and investment ideas.

The fund had listed excellence, integrity, innovation and team spirit as the four values that would characterise the organisation. The excellence should be reflected in professional skills. Integrity was a premise for a delegated structure. The autonomy should allow for innovation in the way we invested. And the desire to learn from colleagues and other teams should encourage team spirit.

The idea was to build an organisation of excellent professionals and strong individuals who would continuously adapt their investment processes within an atmosphere of friendly competition. In many ways, we saw that independence and autonomy led to more mutual respect and collaboration, not less. An organisation that was atomistic by design would encompass strong teams, nurtured by mutual respect, shared values and a defining common investment culture.



The investment process
The investment process was not directed towards financial markets or competition with other market actors. It was about developing deep insight into companies' business. To this end, we specialised in an ambition to know more about the companies we invested in.

We developed specialist roles with specialist knowledge requirements for all our mandates. The idea was to design a structure that would create individual specialist insight into a few and comparable companies that could be followed over time by each of the portfolio managers.

The information sources, the analysis of the information, and the formation of investment views, were the elements building our fundamental company insight. Over the years, we expanded our fundamental research, with emphasis on financial models, company meetings and industry analysis.

The research was directed towards the real business of the companies. We were attuned to longer-term company developments and based this on fundamental research. This followed from, and aligned with, our role as a long-term owner of large stakes in individual companies.

The investment insight – specialisation and skills

We have sought to develop both specialist roles and specialist knowledge. The professional role has been all about investing; the knowledge has been all about fundamental company insight. The specialist skillset and specialist insight were intended to develop a competitive advantage.

The first element was the specialisation of the professional role. We would combine the role of analyst and investor in what we at the time described as breaking the triangle. The portfolio managers should have first-hand research insight and be the definitive experts in the companies they invested in. We did not rotate the roles or plan for our professionals to move into other areas.

The second element of specialisation was to ensure that each of our portfolio managers knew more by covering fewer companies – typically between 20 and 30 for the experienced managers, fewer for the younger ones. The companies were mostly within the same or adjacent industries. The business models would be comparable, the markets similar, or they would be part of the same economic value chain. We also tried to ensure stability in the coverage so that knowledge could be built over time. This would also create durable relationships with company management and ensure a recognition of the fund as a long-term owner. Specialisation of knowledge was thus based on the companies being few, comparable and covered over time.

The number of companies would be limited by design. Initially, we used a standard industry classification and would cover all companies within an industry. Later, we let the portfolio managers define their company focus. Finally, we introduced research lists as a management tool and aligned the list with what the portfolio managers believed would be an optimal investment universe.

Specialisation and deep knowledge could have created unwanted certainty of abilities and insights. Convictions had to be tenuous and not definitive, as business models and company fortunes change. We had to understand the limits of our specialist knowledge and know what we did not know, rather than know what the market knew.

The investment practice – research and knowledge

The company insight strategies were based on knowing companies in depth. Our portfolio managers would seek to understand how the companies' business would create value, what their strengths and weaknesses were, and how this would be reflected in the business opportunities, market developments and future risks they would face.

Given the high degree of competition and informational efficiency in the capital markets, the execution of a research strategy needs to be relentless and innovative in order to create excess return. Fund management is a knowledge industry where the processing of information is the central activity. The assembly of information sources, the analysis of the information obtained, and the development of investment views based on this, are the essence of the investment process.

Over the years, we have expanded our sources of information and reduced our reliance on readily available market research. High-quality research from investment banks will have a wide circulation and be reflected in market prices. It is hard to make better investment decisions than others if you rely on the same information, in the same format, and consider the same investment views.

We have sought to widen our information sources and build our own capabilities. Interacting with expert networks has proven valuable, and we have used this venue extensively. We built a primary research team that developed research ideas together with the portfolio managers and procured data to test key investment ideas. We developed a database with our detailed forecasts of financial metrics, and we gathered all relevant company information in a centralised repository. The financial data were complemented with a database of environmental, social and governance information.

The real interest would be in the companies' business, their products, technologies and organisations. We would meet company management rather than market participants, encouraging our portfolio managers to travel to visit companies. We would research actual business issues rather than scrutinise market prices. We would not look for share price triggers or be overly concerned about market consensus, and we created our internal trading process to lessen interest in daily price fluctuations. We would try to think as owners and be concerned about business viability, rather than be market players expressing tactical views.

We wanted to be in a position of competitive advantage, aligning our process with the natural advantages of the fund. We had no marketing requirements, no need to tell a good story, and could focus on numbers rather than words. We could concentrate on investing and adjust the investment process as we saw fit. The research process was continuously altered with an ambition to create a knowledge advantage. We sought more information, more targeted information, and more information of a higher quality. The information should ideally be differentiated, related to key value drivers, and aligned with the longer time horizon that characterises the fund.

The investment target – all about companies

The fund is the world's largest single owner of listed companies, and we have, as a consequence, unsurpassed access to company management. We conduct more than 3,000 company meetings every year. This is an

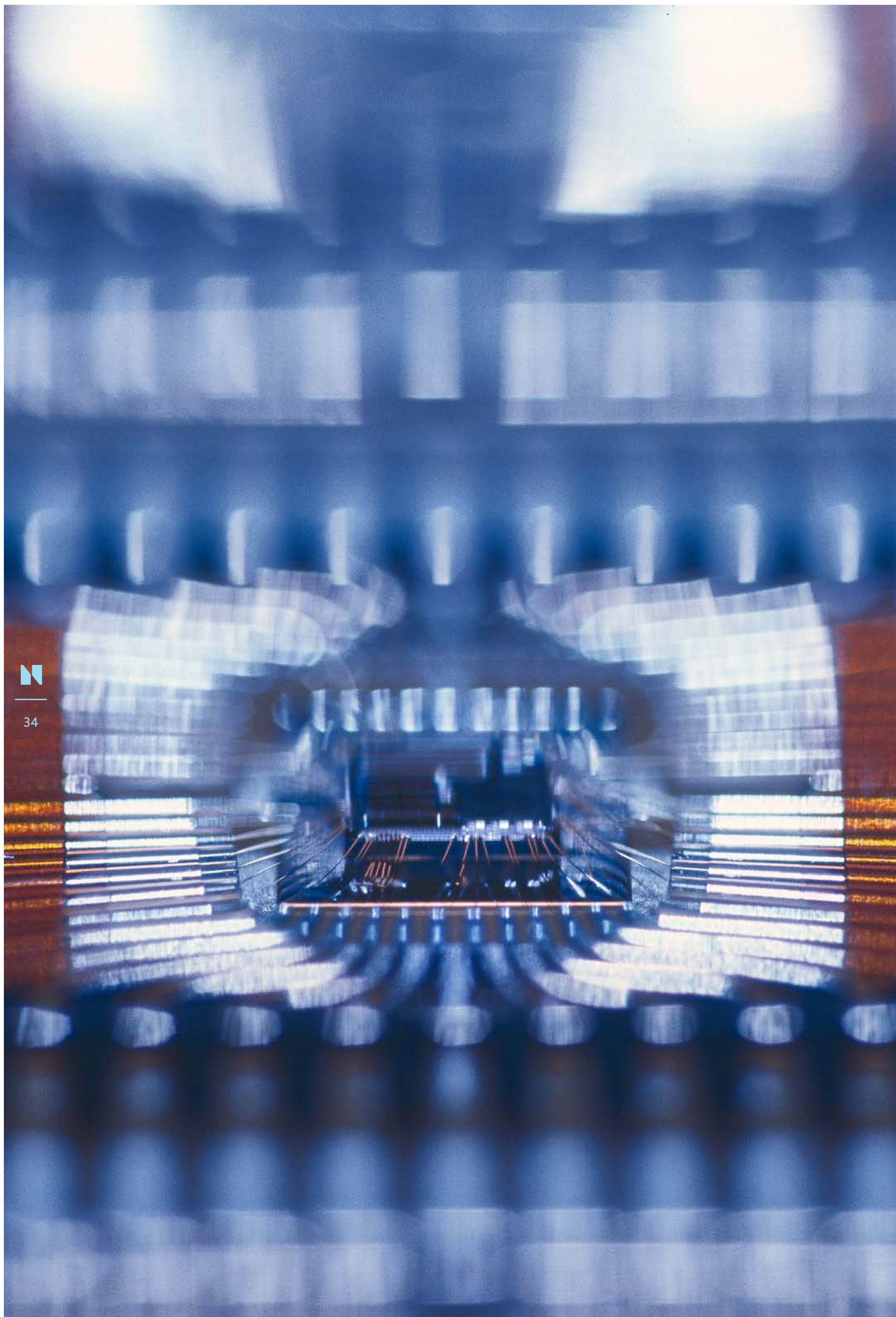
important part of our research process. The companies naturally know their own business, competitors and markets better than anyone else. Over time, this company interaction has greatly improved our knowledge about the companies we are invested in, and the management teams that run them. Meetings at our offices are important, but more so is visiting the companies and their operations.

In 2013, we created an internal corporate access team to facilitate our interaction with companies and to strengthen their knowledge of the fund. It has always been important for us to meet the companies in a professional way and be well prepared for any interaction. The individual portfolio manager represents the fund and should be an accessible and valued discussion partner. In our company interactions, we would underscore our long-term orientation and our mutual interest in sustainable profitability.

The ownership responsibilities have increased as the fund has grown and as our company stakes have become more substantial. This has given our company insight strategies a new dimension through our ownership role. The portfolio managers are the main contact point in the fund for the companies they cover and will contribute their knowledge and assessments to our voting decisions at shareholder meetings and other engagement activities. We have emphasised the fund's ownership role and encouraged the portfolio managers to think as owners. This is about investing, but in the end also about the reality of the fund's company ownership.

Equity investments now account for the bulk of the assets in the fund and most of the risk to our future investment returns. To better understand the expected return and risks for the fund, we need to know what we are invested in. Engaging with companies and knowing their business in depth strengthens this risk assessment.

We strive continuously to ensure that we improve our company relationships, and that the interaction will be understood as support for the company from a long-term owner. We are likely to be a significant owner of most of these companies for decades. The portfolio managers' active engagement with the companies should contribute to making the fund a respected and trusted owner, and a welcome investor in the countries where we invest.



The investment mandates

The investment mandates defined both the investment universe and the benchmarks that would determine how the portfolios would be measured and funded. In addition, the mandates outlined a series of investment restrictions that directed the investment activity and contained the investment risk. The pragmatic selection of our investment universe, the tailoring of mandates through tailored benchmarks, and the consideration of risk in aggregate for the strategy, have all three defined our investment approach.

The investment universe would guide both our research activity and where most of the investment positions could be taken. We concentrated on larger companies and emphasised our European holdings. We would eventually extend our investment universe to cover all major industries, and added on mandates that would target capital market transactions, environmental investments and the Chinese equity market.

The tailored benchmarks were used to structure the overall investment strategy, to measure a portfolio manager's performance, and to define how a mandate would be funded. They both represented the strategic direction and mirrored the return the fund had forgone to finance the mandate.

The individual mandates had investment restrictions that anchored the investment risk to the intended research focus. The risk considerations were managed at the aggregate strategy level. We designed the combined investment strategy for consistent returns and low risk. In the process, we would attenuate all risk dimensions we could not form a clear research-based view on.

The investment universe – all large companies

The funds expanded its investments to more companies and more countries over the years. Three important changes were implemented in the fund's equity benchmark index in the 2007–2009 period. Small companies were included in 2007, emerging markets in 2008, and the equity allocation increased to 60 percent of the fund in 2009. The high allocation to Europe that the fund had from the start was somewhat reduced from 2012.

The research and investment universe for our company insight strategy has for the most part consisted of large companies. They constitute a large part of the fund's investments, and knowing them well is important for our ownership role and risk management. These companies tend to be more international than smaller companies, and this chimes well with our global investment footprint. The investments in large companies can be scaled to an adequate size, and research will be more cost-efficient.

The extension of the fund's investments to include small companies in 2007 did not change our strategy coverage. We decided instead to fund external mandates for smaller companies in Europe and Asia. Continental Europe, Japan and South Korea got special attention. The internal sector and capital strategies have explicitly targeted larger companies, although the capital market strategy has been spread wider as regards company size over time. The environmental mandates have been more size-agnostic, as emerging technologies sometimes need to wait for a market to grow and to prove itself over time. The China mandates have gradually moved towards concentrating on the larger Chinese companies.

Although our investment universe covers almost all equity markets in the world, our internal strategy has been geographically selective. Throughout our history, we have had an emphasis on European investments. Given the fund's large strategic allocation to European assets, we wanted to have a deep knowledge about European companies. We also thought we had a better chance of generating excess returns in Europe.

The fund's equity investments in emerging markets have mainly been managed by local external managers. With the expansion to all emerging markets from 2008, we decided to award a series of mandates to external managers in the 23 new emerging markets. Local managers tend to have an edge in emerging markets, as the influence of local business conditions, regulation and connections is strong. Emerging markets are characterised by large state-owned companies and family-controlled conglomerates, and local financing conditions and contract awards need to be understood. We also benefited from the external managers' insight into corporate governance.

The weight we have given to fundamental research calls for on-the-ground presence and meetings with company management. There will always be a limit to the optimal area of presence. We decided that we needed to be present in China given the importance of the Chinese economy and the potential size of our investments there. We therefore established an internal investment team at our office in Shanghai.

We decided originally to limit the coverage in our sector strategies to a few select industries. First out were banking, insurance, retail, software, media and telecommunications. By 2007, we had added oil, utilities, basic industries and capital goods. The industries we selected were the ones where we believed we could build a competitive edge relative to the rest of the market. Limited analytical resources in a sector at other market participants was an advantage. Industry composition was also considered. Industries that consisted of a few dominant companies, or a very long list of smaller companies, were not optimal.

The significant increase in fund assets and ownership stakes from 2007 to 2010, in part coming from the increase in the allocation to equities to 60 percent of the fund, required us to increase the coverage of our largest holdings. By the end of 2015, we had added coverage of health care, and we then in effect covered all large industries in which the fund had assets.

At the turn of the millennium, the major development in the corporate arena was the globalisation of the business world and existing industries. Companies developed global supply chains, produced and sold for a global market, and competed for a global pole position as industries consolidated. In retrospect, a global sector strategy turned out to be a sensible choice.

Today, the major development in the corporate landscape is the disruption of traditional industries. New technologies, business models and product solutions are paving the way for young companies outside traditional sector definitions. In 2017, we set up a new team outside the sector strategy area to focus on disruptive technologies and their impact on value chains and segments of the economy. In 2019, we combined the oil, utilities and environmental strategy teams to cover the entire energy complex as the energy transition

escalated. As the industry definitions became less obvious, we chose to design our mandates at odds with traditional sector divisions.

The investment benchmark – the tailored slices

The characteristics of the fund, including its size and global exposure, allowed flexibility in how we could structure the mandates. When more assets were invested in a mandate, fewer assets were invested in the same segment in the indexing strategies. Allocating capital to a mandate would not change the overall composition of the fund.

The benchmarks would be used to measure the mandate performance, but also define the funding. The benchmark and the funding have most of the time been identical. The benchmark return is the weighted return on the stocks that were sold when funding the mandate. This is then the return the fund has given up and therefore the cost of funding.

The benchmark return for a mandate would reflect the return in the market segments where the mandate invests. The portfolio manager could have a positive fund contribution even if the portfolio had a negative return, as long as the return on the relevant benchmark was even lower. The mandate's relative return would flow directly through to the fund level and contribute to the fund's relative and absolute return.

The benchmarks reflected the chosen investment structure, and they had different formats over the years. Early on, we cut slices from the index portfolio in line with the industry classification used by the index provider. Over time, the tailoring was fine-tuned to specific companies. The design would follow our consideration of a natural investment area and the optimal use of individual knowledge and skills. We would move away from a simple capitalization weighted benchmark towards a more equal-weighted profile. The benchmarks were paired with the research targets, thus reflecting our combination of the analyst and investor roles. The mandates would be designed to combine into a desired profile for the combined strategy.

The allocation of capital was based on an assessment of the potential to outperform on a relative basis within that market segment and with the specific portfolio manager, not how the mandate segment would perform relative to the broad market. Also, as the mandates were not standalone products, there was no need for each mandate to be diversified. The diversification objective would be met at the fund level.

The tailored and detailed benchmarks served a three-fold function as a yardstick for measuring performance, a reflection of the cost of funding, and a definition of the individual research universe. The identity of the benchmark with both funding and research targets has been a hallmark and distinguishing feature of our strategy.

The investment restrictions – the risk considerations

The investment mandates would not only define the investment universe and the investment benchmark, but also specify a series of investment restrictions. The restrictions would typically list the instruments that could be used, and include limits on cash levels, currency exposure and ownership stakes.

The instruments we employed would in general be limited to common equity, as we could express our investment view through simple

securities. Other investment structures, including derivatives and non-linear instruments such as options, would add complexity with limited upside.

We wanted all portfolios to be fully invested, and cash holdings were limited to avoid market timing issues. We also sought to adjust the sensitivity to overall market direction on an aggregate fund level, and any excess cash would be equitised. The country exposure consideration was left to the managers, and any foreign exchange exposure could be hedged. The aggregate currency risk was considered on the combined strategy level. We wanted portfolio managers to concentrate on company issues, rather than being concerned with market direction and foreign exchange volatility.

The mandate restrictions would typically include a limit on ownership stakes. The fund was a financial investor and not a strategic investor. As a government fund, we would limit any position that could entail a direct strategic influence. The fund-level mandate would limit our ownership stakes and voting rights to 10 percent of a single company. The individual mandates kept them even lower, and rarely did we go above a 5 percent ownership stake.

The number of investments in the portfolio was not constrained. The research lists and benchmarks did, however, only include a limited number of companies, typically between 20 and 30. There was an option to invest outside the research list, but the amount would be limited in the mandate. The strategy design would entail quite concentrated portfolios.

The portfolio positions tended to be balanced, although there were few restrictions on absolute size or share of the largest positions. Overall, our experience was that many portfolio managers took lower relative risk in single investments than was optimal from a fund perspective, as the fund was much more diversified than the individual mandates. This was challenging to address given the desire for autonomy in the investment decisions, and was one of the reasons for setting up the capital market strategy.

There were no restrictions on trading and turnover. The trading costs through market impact were relatively low due to the structure with many independent mandates. The trade book procedure, with instant pricing based on our market impact model, made the trading cost visible up front and easy to consider for the portfolio managers.

The more elaborate risk considerations, such as risk profiles and systematic risk factor exposures, were left to discussions based on available risk analytics presented to the portfolio managers. In the early years, we balanced style tilts by recruiting people with different approaches. In the last decade, we have managed systematic risk factor exposures more explicitly through an internal reference portfolio that in effect tilted our index portfolios towards opposing factor exposures. The systematic risk factors could be modified but not fully neutralised.

The most important risk modifier was not in the restrictions specified in the mandates but in the actual structuring and funding of the mandates. The sector strategy was sector-neutral by design. The specialist strategies were also mostly sector-neutral given the funding structures. The actual funding of the individual mandates would consider the incremental value at risk and extend this to a series of additional risk measures.

The company insight strategies covered fewer than 1,000 of the more than 8,000 companies in the fund benchmark. These companies would still constitute more than half of the value of our equity investments. A reason for this attention on fewer and larger companies was the important role the company insight strategies played in the overall management of the fund besides the value created through excess relative return.

The company insight strategy was focused on the overall interests of the fund. The understanding of the long-term risk to the fund would not have been the same without this deep knowledge of our largest company investments. We also needed the company insight to fulfil our role as a large owner in an insightful way. Through our company interaction, we would build trust with the companies and countries where we invested, and strengthen the legitimacy of our investment activities. The imperative objective was the long-term value creation from our investments in a fund for future generations.

Chart 1 Net asset value by mandate type. Assumption made to convert capital base during long/short period. Billion kroner.

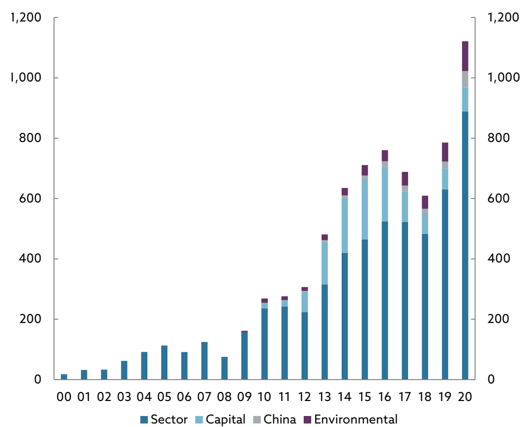


Chart 2 Distribution of net asset value by mandate type. Percent of total.

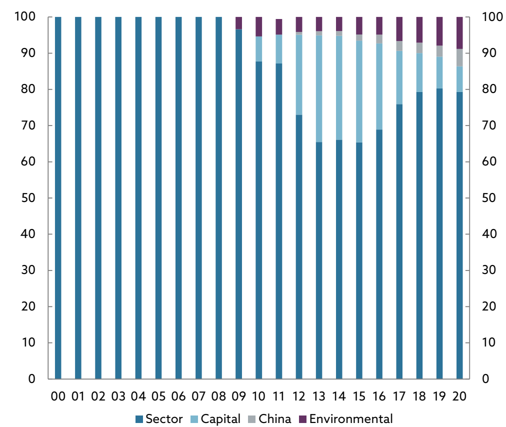


Chart 3 Net asset value by mandate type as a proportion of fund equity investments. Assumption made to convert capital base during long/short period.

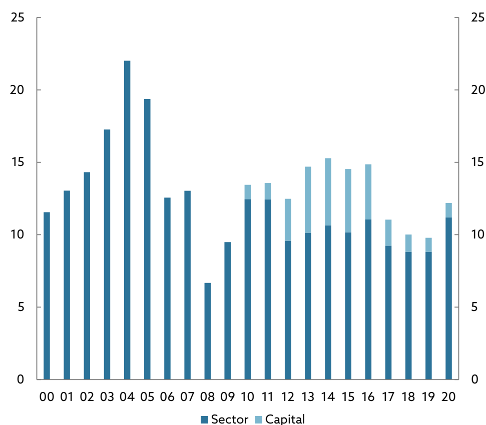


Chart 4 Net asset value by mandate type as a proportion of fund equity investments. Percent.

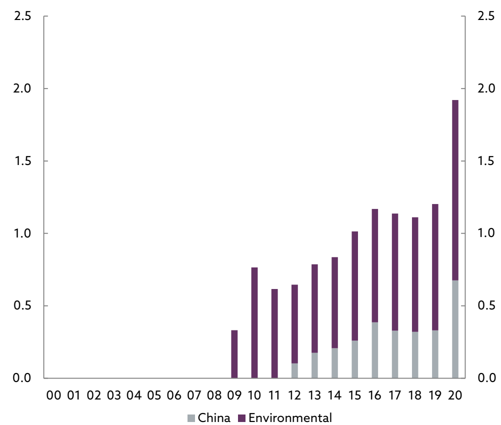


Chart 5 Market value of overweights by mandate type. Offsetting positions across mandate types not deducted. NOK billion.

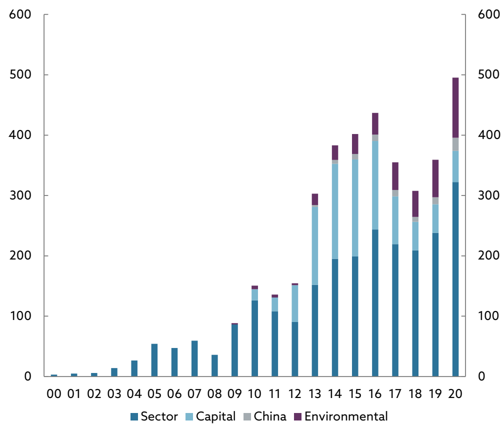


Chart 6 Contribution to the overall equity fund's active share. Offsetting positions across mandate types not deducted. Percent.

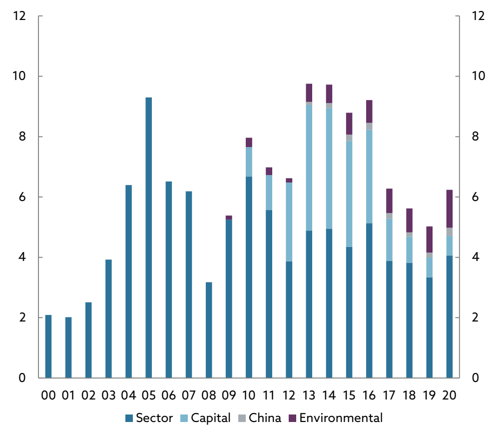


Chart 7 Number of mandates by mandate type.

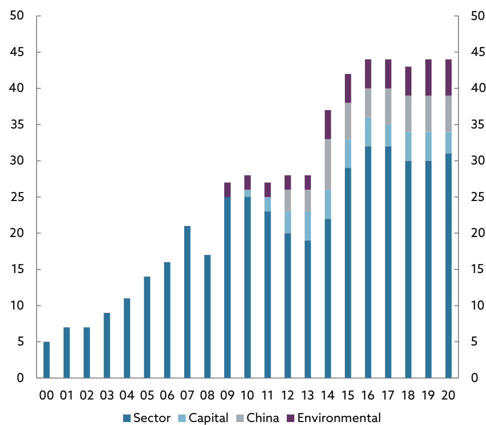
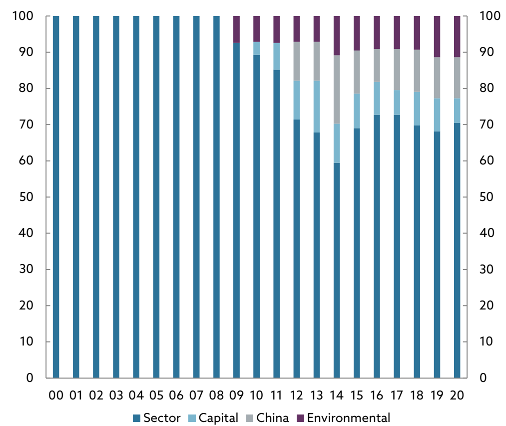


Chart 8 Distribution of number of mandates by mandate type. Percent of total.



The return

We have invested with company insight for 21 years. Over this period, our strategies have made a strong, positive contribution to the fund's relative return. Combined, the strategies have outperformed their benchmark by 1.1 percent on average per year. The monetary value of this outperformance is 87 billion kroner.

The returns over time
From the beginning of 2000 to the end of 2020, the combination of our four strategies had an absolute return of 4.5 percent on average per year. In comparison, the benchmark of the combined strategies returned an annualised 3.4 percent in this period. The benchmark return reflects what the fund would have earned on the assets managed by the four strategies if the assets had been invested passively. The strategies thus produced a relative return of 1.1 percent on average per year.

Cumulatively, the absolute return was 153 percent, while the benchmark return was 102 percent. The cumulative outperformance was thus 51 percent on an arithmetic basis and 25 percent on a geometric basis. The monetary value of the cumulative outperformance is 87 billion kroner, before costs and without taking any effects from reinvesting into account.

It is common to compare the annualised relative return with the portfolio's tracking error, a measure of the relative risk. The tracking error has varied somewhat over time. Prior to the global financial crisis, the tracking error was typically between 1 and 1.5 percent. The tracking error increased during the financial crisis, with typical levels between 3 and 3.5 percent when measured over 60 months. After the financial crisis, the tracking error has typically been between 1.5 and 2 percent. Across all 21 years, the tracking error is 2.2 percent. This leads to an information ratio of 0.6 for the full period.

Note that all return figures include converted returns for the long-short period between June 2005 and December 2009, as described at the end of this section.

Over the 21 years, there have been stretches with good performance and some periods with underperformance. For the period as a whole, good performance has tended to accumulate steadily over longer periods, while underperformance has occurred over shorter periods and has tended to be more pronounced when it took place. In the last two years, the overall strategy has performed very strongly based on strong performance in all the four strategies.

The first long stretch of good performance started in 2003. The sector mandates, which had started from scratch in 1999, had developed considerably in the first few years. By 2003, they had started to find their shape. In the five and a half years from January 2003, we outperformed our benchmark by 1.5 percent on average per year. During the same period, the organisation matured considerably. It became larger, it became more international, and it provided portfolio managers with increasingly advanced support.

The long stretch of good performance came to a halt in September 2008. We had large positions in American and European banks. When Lehman Brothers filed for bankruptcy, several of our long positions reduced significantly in value, while some of the short positions actually increased in value.

When we experience dramatic underperformance, we reassess both our portfolios and our strategy. We will assess which positions and mandates have the potential to rebound and where losses should be cut. We also look at whether the strategy needs to be changed.

The portfolio rebounded in 2009, and changes to the strategy started in earnest in 2010 and were implemented in the following years. The changes to the sector mandates strategy were mostly driven by the greatly increased size of the equity assets and the much more prominent ownership role, but they were also influenced by our experience during the financial crisis. As part of the strategy change, we also developed the capital mandates, the environmental mandates and the China mandates to complement the existing sector mandates.

The period of change coincided with some underperformance. From 2011 to 2014, we underperformed by 0.8 percent per year on average. There were some external factors that contributed to this, such as the European sovereign debt crisis, the Fukushima nuclear disaster, and the market frenzy in Chinese small caps towards the end of 2014. We were not well positioned for these events. The largest contributor to the underperformance was a position in Tesco plc in our capital mandates. As in 2008, we reassessed both our portfolio and our strategy after the experiences of 2014. This led to changes in how we managed the capital mandates.

The underperformance between 2011 and 2014 was followed by our most successful stretch of results to date. In the six years from 2015 to 2020, we outperformed the benchmark by 2.1 percent on average per year. This was achieved on a high asset base. The performance in 2020 was particularly noteworthy. While global markets fell dramatically in the first quarter on the huge uncertainty created by the Covid-19 pandemic, we outperformed our benchmark by 0.7 percent in this quarter. As markets subsequently rallied, we outperformed in each of the last nine months of the year.

The returns reported above are on a conventional time-weighted basis. This means that each period

is given the same weight when calculating averages. As we have seen tremendous growth in assets over the 21 years, it is also relevant to look at averages where each period is weighted by the amount of assets managed.

On an asset-weighted basis, the annualised relative return across the full period was 1.2 percent. This is close to the 1.1 percent on a conventional time-weighted basis. While very strong performance in 2000 is given a very low weight in the asset-weighted return, this is more than offset by very strong returns in recent years, when assets have been large.

All returns in this document include transaction costs, but not costs associated with managing the assets. The main costs related to managing the assets are internal management costs and the cost of obtaining research. From the beginning, a key part of our strategy has been to keep costs low.

We have calculated and published our costs at a strategy level since 2013. The four strategies depicted in this document correspond quite closely to the strategy called internal security selection in our reports. The cost of managing the internal security selection strategy has been 0.06 percent of assets on average since 2013, as reported in our 2020 annual report.

The main difference between the four strategies in this document and the internal security selection strategy is that the latter includes the management of our credit portfolio. The cost of managing credit assets is much lower than the cost of managing equity assets. We estimate that the cost of managing the equity assets included in the internal security selection strategy is about 0.07 percent per year since 2013, with fairly little variation from year to year. This is a good estimate of the management costs of the combined four “investing with insight” strategies.

Table 1 Annualised performance.

	2000-2005	2006-2010	2011-2015	2016-2020	Full period
Portfolio return	-0.9	3.0	7.4	9.9	4.5
Benchmark return	-2.1	1.6	7.8	7.8	3.4
Relative return	1.2	1.5	-0.4	2.1	1.1
Tracking error	1.6	3.3	2.0	1.7	2.2
Information ratio	0.9	0.6	-0.1	1.3	0.6

Assumptions made to convert returns during long/short period.

The returns by strategy

All four strategies have contributed positively to the combined outperformance since 2000. On a monetary basis, the sector mandates have contributed 41 billion kroner, the capital mandates 5 billion kroner, the environmental mandates 29 billion kroner, and the China mandates 12 billion kroner.

The sector mandates were launched in June 1999. The monetary return in 1999 was positive, but relatively small in comparison later years. We therefore use January 2000 as the initial month for performance purposes. The capital mandates, environmental mandates and China mandates were launched in December 2010, January 2010 and January 2012, respectively.

All four strategies have posted positive relative returns since their respective inceptions. The sector mandates have achieved an annualised relative return of 0.9 percent, the capital mandates 1.3 percent, the environmental mandates 4.4 percent, and the China mandates 7.4 percent.

There are several possible drivers of the variation in relative returns across mandates and strategies besides individual portfolio manager skill and more exogenous factors. The relative risk differs between the strategies. The sector mandates have a relatively low tracking error. Since inception, it has been 2.1 percent on average. The corresponding figure is 7.4 percent for the capital mandates, 5.0 percent for the environmental mandates, and 6.1 percent for the China mandates.

The sector mandates have a relatively low tracking error because the many mandates diversify the strategy, but also because they by design only take positions within industries. The specialist mandates had fewer mandates and invested across sectors. Investing across industries was one of the reasons why we launched the capital mandates. The environmental mandates have a universe that crosses traditional industry classifications, while the China mandates have been selective within their universe.

There are other factors that impact the return potential of the different strategies. The sector mandates have managed large amounts of assets over the years. This would tend to limit their return potential in percentage terms. The sector mandates also participate in a highly competitive segment of the market, namely large caps in developed markets. These two factors are not unrelated. Competition in large caps in developed markets is robust because it is a high capacity segment where market participants like us can deploy large amounts of capital.

The three specialist strategies have not only managed smaller amounts of assets, but they have also invested in segments of the market that are arguably less competitive. The capital mandates have in recent years made substantial gains from capital market transactions. These are generally priced at an attractive level, although there is always the risk of being allocated more shares in the unattractive offerings. The environmental mandates make investments in somewhat smaller companies than the sector mandates. They have also enjoyed tailwinds from a repricing of green stocks in recent years. With regards to the China mandates, the Chinese onshore market is relatively immature.

We do not manage any of the strategies in isolation. They are managed as part of the overall fund. An important consequence is that we have not aimed to maximise the percentage relative return. We have incrementally allocated

funds to strategies with spare capacity to achieve higher expected monetary returns.

Further details on performance at a strategy level can be found at the end of the chapter on each strategy.

The returns on the mandates

We have had around 90 portfolio managers since inception in January 2000. The number of mandates is somewhat higher, as some portfolio managers have had more than one mandate. We look here at mandate returns since January 2010, as long-short accounts were used between June 2005 and December 2009.

Two-thirds of our mandates have posted a positive relative return since January 2010. The average annualised relative return across mandates is 2.5 percent since January 2010. This figure is influenced by a handful of mandates with exceptional results. The median annualised relative return across mandates is 1.1 percent. In comparison, the annualised relative return for the four strategies combined was 1.0 percent between 2010 and 2020.

Mandates vary significantly in size and duration. As at the strategy level, we do not fund mandates with the intention of maximising percentage relative returns. Experienced portfolio managers will typically receive additional funding, as we want to maximise the contribution to fund returns, always taking risk into consideration. We expect their relative return in percent to decline as a result. A direct comparison of results across mandates needs to keep this in mind.

Note that all return figures in this document include converted returns between June 2005 and December 2009. In this period, only long-short accounts were used. By design, the long-short accounts had a net asset value close to zero. Percentage returns based on the actual net asset value are therefore not applicable during this period. To ensure a continuous return series, we have converted the monetary returns in the long-short period to percentage returns by setting the net asset value to twice the value of the long positions. This is essentially equivalent to assuming a constant 50 percent active share.

Further details on performance at the mandate level can be found in the chapter on the sector mandates.

Chart 9 Percent of benchmark companies in the portfolio. Average per mandate type.

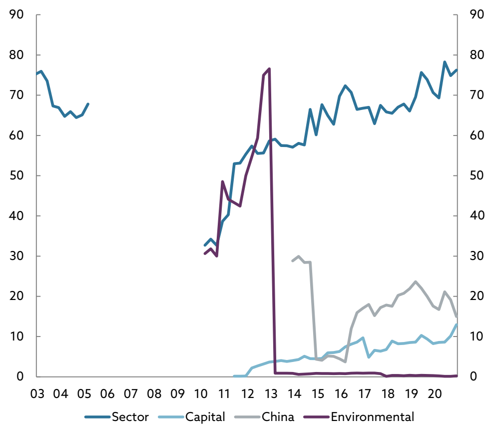


Chart 10 Total number of companies in the portfolio by mandate type.

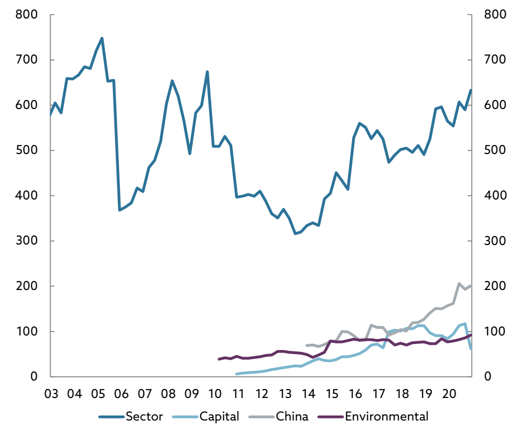


Chart 11 Active share by mandate type. Percent.

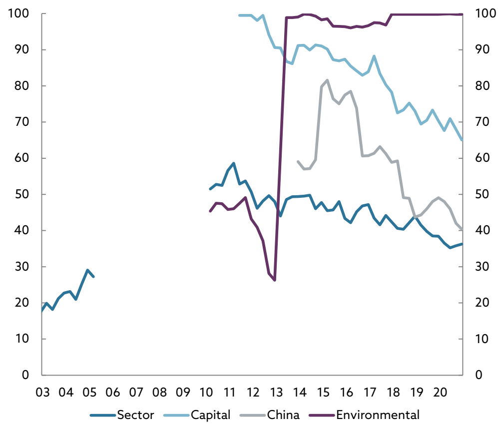


Chart 12 Average share of top ten holdings across mandates by mandate type. Percent.

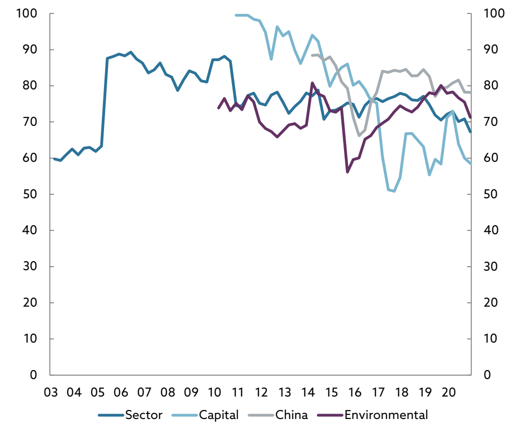


Chart 13 Cumulative relative return by mandate type. Assumptions made to convert returns in long/short period. Geometric difference in percent.

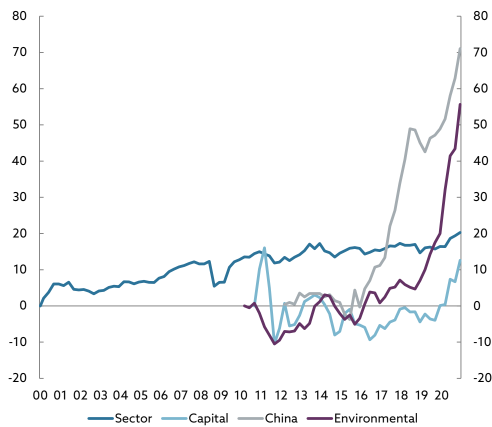


Chart 14 Cumulative relative return by mandate type. Billion kroner.

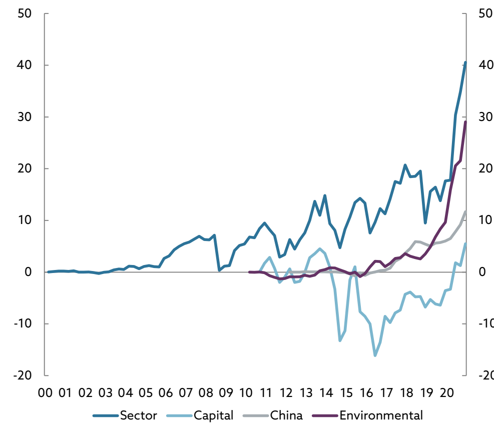


Chart 15 Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis) by distinct periods. Assumptions made to convert returns in long/short period.

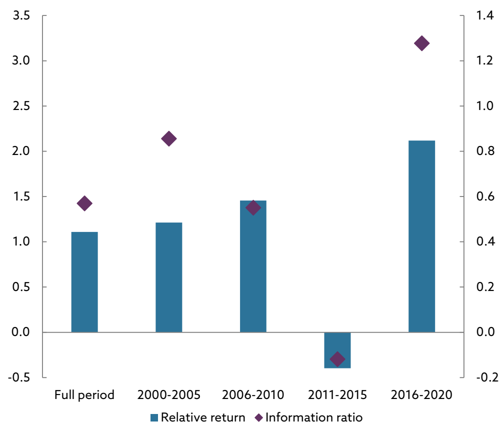


Chart 16 Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis) by mandate type since respective inception date. Assumptions made to convert returns in long/short period.

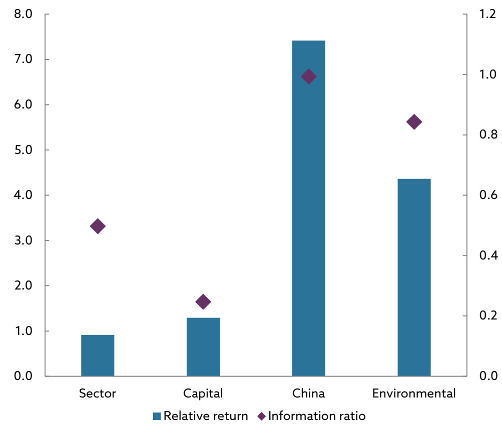


Table 2 Relative return per year.

Year	Sector	Capital	Environmental	China	Combined
2000	5.4				5.4
2001	-1.3				-1.3
2002	-0.2				-0.2
2003	1.5				1.5
2004	1.4				1.4
2005	1.2				1.2
2006	3.4				3.4
2007	0.8				0.8
2008	-2.8				-2.8
2009	7.8				7.8
2010	2.2	10.6	-2.0		2.7
2011	-2.2	-13.7	-6.3		-3.1
2012	2.1	4.5	5.4	3.6	2.3
2013	3.4	6.4	8.6	-0.1	4.2
2014	-2.4	-9.8	-3.5	-3.2	-4.9
2015	1.2	1.9	-1.5	-1.6	1.2
2016	-0.6	-0,1	4.8	9.6	-0.1
2017	2.1	5.7	7.2	25.5	3.4
2018	-1.9	-3.1	-0.1	6.1	-1.6
2019	1.9	5.9	14.7	3.6	3.2
2020	3.5	13.6	30.8	20.1	6.9

The return of Capital in 2010 is for one month only. Assumptions made to convert returns during long/short period.

Table 3 Annualised relative return.

	Sector	Capital	Environm.	China	Combined
Sub-period: 2000-2005					
Time-weighted	1.2				1.2
Asset-weighted	1.0				1.0
Sub-period: 2006-2010					
Time-weighted	1.3				1.5
Asset-weighted	1.0				1.2
Sub-period: 2011-2015					
Time-weighted	0.2	-1.2	-0.6	-0.1	-0.4
Asset-weighted	0.2	-1.8	-0.3	-1.1	-0.4
Sub-period: 2016-2020					
Time-weighted	0.8	3.8	10.8	12.2	2.1
Asset-weighted	1.0	3.0	13.0	13.6	2.3
Full period: 2000-2020					
Time-weighted	0.9	1.3	4.4	7.4	1.1
Asset-weighted	0.7	0.3	8.6	11.2	1.2

2010 returns have been included in the 2011-2015 subperiod for Environmental and Capital on a standalone basis, but in the 2006-2010 subperiod for the Combined strategy. Assumptions made to convert returns during long/short period.

Table 4 Net asset value at end of year.

Year	Sector	Capital	Environmental	China	Combined
2000	18				18
2001	32				32
2002	33				33
2003	62				62
2004	92				92
2005	113				113
2006	91				91
2007	125				125
2008	75				75
2009	156		5		162
2010	236	19	14		269
2011	242	22	12		277
2012	224	68	13	2	307
2013	315	142	19	5	481
2014	420	182	25	8	635
2015	465	200	34	12	711
2016	524	181	37	18	761
2017	523	101	46	19	689
2018	483	65	43	18	610
2019	630	69	62	24	785
2020	889	80	99	54	1,121

Assumption made to convert capital base during long/short period.

Table 5 Share of months with positive relative return.

	Sector	Capital	Environm.	China	Combined
Sub-period: 2000-2005	**60**				**60**
Up-market months	75				75
Down-market months	41				41
Sub-period: 2006-2010	**72**				**72**
Up-market months	86				86
Down-market months	52				52
Sub-period: 2011-2015	**53**	**44**	**53**	**54**	**53**
Up-market months	59	58	61	44	68
Down-market months	43	22	39	69	30
Sub-period: 2016-2020	**60**	**63**	**72**	**67**	**70**
Up-market months	74	73	75	62	83
Down-market months	33	48	65	74	45
Full period: 2000-2020	**61**	**54**	**61**	**61**	**63**
Up-market months	74	65	68	55	78
Down-market months	43	35	50	72	42

2010 returns have been included in the 2011-2015 subperiod for Environmental and Capital on a standalone basis, but in the 2006-2010 subperiod for the Combined strategy. Assumptions made to convert returns during long/short period.

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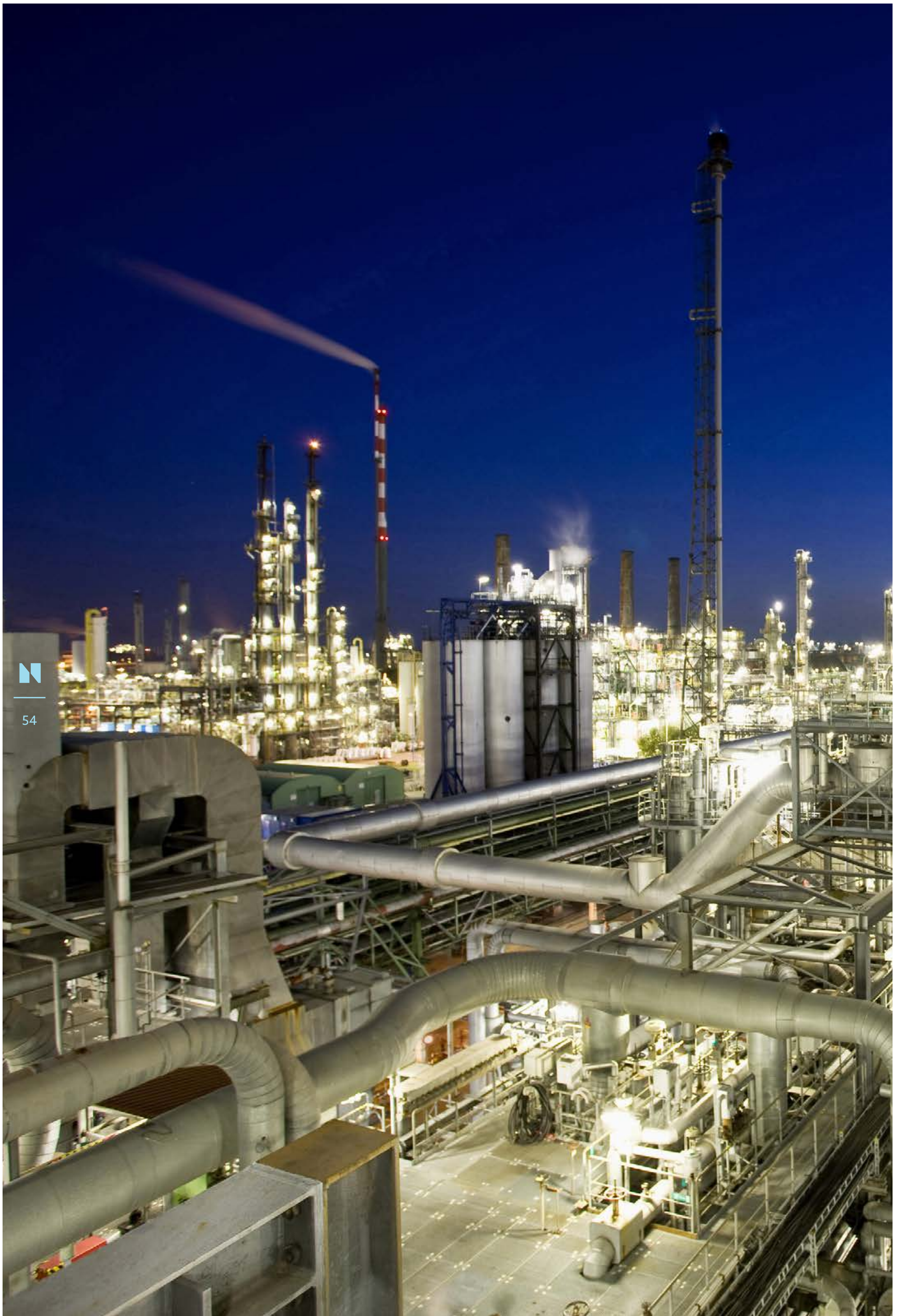


The sector mandates

The sector strategy has been our main company investment strategy since we funded the first industry mandates in 1999. The foundations have remained the same since inception. Individual investment mandates are delegated to industry specialists who conduct fundamental company research within their industry. The strategy has given us a deep insight into the fund's investments and has been the basis for our company interaction and ownership role.

The sector mandates have been the core of our internal company investment and security selection strategy. Overall, there has been a great deal of continuity in this strategy. Specialisation as the basis for investment research, and autonomy as the basis for decision making, have been the cornerstones of the strategy since the beginning.

Each portfolio manager specialised in a single industry and was expected to become deeply knowledgeable about the companies he or they covered. The portfolio manager had sole responsibility for a separate portfolio and tried to identify good investments within the industry, funding these by selling less attractive investments in the same industry.

The sector mandates have contributed positively to the fund's relative return since inception. Good results have come from having the person with the deepest company knowledge make the investment decisions. The combination of specialised research and investment autonomy has also been important in attracting strong investment professionals.

The history

The globalisation of industries and business activity set the background for our global sector strategy. We organised our internal active strategies along industry lines to create deep fundamental insight into the companies we invested in. We have established, developed, consolidated, and refined our investment process over the last two decades.

In the late 1990s, standard practice in the market was for portfolio managers to have a broad investment universe. They typically made investments across all industries within a geographical area, most often a country. Our external active and index mandates were also at the time structured by country or region. The reason for this was that the fund's equity benchmark was constructed with fixed regional weights and quarterly rebalancing between the three regions of the Americas, Europe and Asia Pacific.

We decided to organise our internal company selection mandates in a different way. Each portfolio manager made investments in one industry only, or in a few related industries. While the industry focus was much narrower than normal, the geographical scope was wider, as the portfolio managers could invest across many countries and regions. The mandate restrictions would anchor the investments to a specific set of industries.

Specialisation was the foundation for developing skill. Specialising along industry lines made research more efficient. Companies that belonged to the same industry tended to have more in common than companies that belonged to the same country. This was especially true for the larger companies, which were becoming more multinational and therefore less dependent on their home market. Equity markets, however, were to a large extent still segmented by country. This created opportunities for industry specialists who could invest across countries.

Establishing the strategy 1999—2005

In 1999, we started to move some of our equity assets from external index managers to internal management. We established internal equity management for both index and security selection mandates by the end of the year.

The first sector mandates – the first trade (1999)

In June and July 1999, we established four sector mandates – two for banks, one for telecommunications and one for computer services. In November, we added a mandate for insurance. The three financial sector managers worked full-time on their sector portfolios, while the other two were part of the external manager selection team and were added to give them portfolio management insight for external manager selection rather than to be part of the sector strategy team in the longer term. Thus, finance was the first sector in which we built a sector team. The sector was chosen as it was large, constituting a fifth of our benchmark index. We also thought at the time that our home within a central bank could give us easier access to company meetings in this industry.

One obstacle to starting internal management was that we needed to get trading systems and

settlement functions in place to be able to trade. We did not believe in waiting for all pieces to fall into place before moving ahead, and a trading arrangement was therefore put in place with one of our four external index managers. We would email orders for an account, and the external manager would ensure that the trades were executed in the market. The impact of our orders on the account's performance would be calculated separately.

We sent the first orders on 2 June 1999. The role of the portfolio managers was to identify and make good investments within their industry and to fund the purchases by selling relatively poor investments in the same industry. Shares were acquired in SEB, Merita Bank and UBS, while shares were sold in Commerzbank, Dresdner Bank and Sanpaolo IMI. The value of each transaction was below 1 million dollars, and the total transaction value was 2.3 million dollars of equity bought and 2.3 million dollars sold. The trade was still a milestone event that led to considerable attention in other parts of the bank, as neither internal equity management nor active security selection strategies were obvious choices for the central bank at the time.

The team was small and young, and only one member had any equity research experience. In fact, four of the five were recent graduates, while the fifth was recruited from a head-of-research position in a Nordic investment bank. Two decades later, four of the five original portfolio managers were still working in the fund. They had been among the most successful of our portfolio managers and led the insurance, listed real estate and external mandate teams.

We were cautious about investment risk and returns. The positions were small and limited to companies in Continental Europe. At the end of 1999, the combined net asset value of the sector mandates was 3.1 billion kroner. This corresponded to 3 percent of the fund's total equity investments, and only about 10 percent of these assets were invested differently to an indexing strategy. In other words, the sector mandates changed the composition of the overall equity portfolio by just 0.3 percent.

The global sector mandates – the London office (2000)

At the end of 1999, we opened our own trading desk. The first trade was in ABN Amro on 15 November 1999. There was no longer any need to continue the arrangement with the external index manager. The assets that had been in the externally managed account were transferred to a new internal account. We also created our first internal index account to manage the assets in the sectors we did not manage actively. The template for sector mandates to be a carve-out from a broad market index portfolio was thus established. This structure gave us the freedom to select which part of the investment universe we would focus on, and was an important element going forward.

All our sector mandate positions in 1999 were in Continental Europe. We aimed from the beginning to run global sector mandates to make full use of industry research and exploit possible pricing differences between countries and regions. The next step was therefore to add investments in other geographies to the sector mandates. In March 2000, we added assets in the US, Canada and Japan to the portfolio. In October that same year, we added assets in the remaining countries where the fund was invested: the UK, Australia, Hong Kong, New Zealand and Singapore. At the beginning of February 2001, six new countries were added: Brazil, Mexico, Turkey, Greece, South Korea and Taiwan. These countries had been included in the fund's benchmark at the beginning of that year.

The five portfolio managers with sector mandates at the beginning of 2000 were all Norwegian and based at Norges Bank's head office in Oslo. It was not a natural place for running a global portfolio. To be closer to global markets, we opened an office in London in August 2000, and the five portfolio managers based in Oslo moved over. The office was minute compared to the headquarters in Oslo. It consisted of the five portfolio managers with sector mandates and a locally hired office manager. In comparison, there were more than 600 employees in Oslo across the whole of the central bank. The small size of the London office and its distance from Oslo helped foster a distinct investment culture.

The London office was set up to be closer to the information flow in the markets. We also made an early choice not to conduct any company meetings in Oslo, and we intended to use the London office for company meetings if the assets ever reached a size where we could secure such meetings. The first five portfolio managers had limited international experience. The second ambition for our London presence was therefore to give the young portfolio managers an international operating platform, and to make working in the central bank a more attractive proposition for young Norwegian talents. The third ambition was to use the office as a recruitment hub for international professionals if we could attract them. With a presence in London, we could start to look for new hires from a much larger and more diverse labour market background.

At the end of 2000, the net asset value of the sector mandates had increased to 18 billion kroner from 3 billion kroner a year before. This corresponded to 12 percent of the fund's total equity investments. The contribution to the equity portfolio's active share had increased to 2.5 percent from 0.3 percent a year earlier.

The growing sector mandates – the five sector teams (2004)

In 2001, we recruited the first two international portfolio managers to the London office, and two more were recruited in the following years. At the time, the fund did not have a visible profile in London. However, the promise of running a global sector mandate was attractive to both investment management and investment bank analysts with specialist knowledge of an industry.

Working for the fund also turned out to be attractive for London-based Norwegians. Within three years of opening the London office, we recruited four Norwegians who were already living in the city and working for large financial institutions. By the end of 2004, two of the original five portfolio managers had moved onto other tasks. With the eight new professionals recruited in London, there were now 11 portfolio managers at the London office, which was still used exclusively for the sector strategy teams.

We had decided to concentrate on a limited number of sectors. The sectors we chose to add in the subsequent years were different from financials. They were smaller and did not attract the greatest market interest. We chose the sectors where we thought we had the largest chance of outperforming the market. Industries that got less market attention and were also going through structural changes were considered ideal. Structural changes could lead to substantial differences in returns between companies within the sectors.

By the end of 2001, we had eight portfolio managers divided into three sector teams. In addition to the financials team, we had one for telecommunications and one for consumer services. The last of these had sector managers in media and retail. By the end of 2004, we had five sector teams with eleven portfolio managers.

Oil and utilities were added as separate teams as we recruited professionals with a research background in oil and utilities and decided to split the two sectors from what was originally a combined energy team.

The sector mandates matured considerably over the years up to 2004. The eight new recruits added career experience, sector knowledge and market expertise. The original portfolio managers had built up their industry knowledge from scratch in London and had also gained experience in running investment mandates. In addition, the infrastructure and systems improved substantially, while dedicated mid-office analysts worked on performance and risk analytics along various dimensions.

The combined sector strategy portfolio mandates were, by design, sector-neutral. This was an intentional setup to reduce performance risk. The mandates were also, by design, always fully invested through cash sweeps and monthly rebalancing. Third, the foreign exchange exposure was taken out systematically. And most important, the portfolio managers were recruited into the team with differing personalities and investment beliefs to reduce investment style bias for the combined portfolio of mandates. The design was intended to limit the risk of large relative underperformance, and removed industry, market, currency and style risk for the combined strategy. This would reduce relative investment risk, but also reduce the scope for outperformance and excess return. The ambition in this early period was set at 0.5 percent outperformance for the aggregated sector mandates, although the annual individual performance targets for outperformance were set at 2 percent.

The increased scope, experience and maturity of the sector teams meant they could handle an increasing share of the fund's investments. At the end of 2004, the sector mandates managed 22 percent of the fund's equity investments, up from 12 percent four years earlier. This corresponded to a fivefold increase in net asset value from 18 to 92 billion kroner, or 15.2 billion dollars. The financials team managed half the assets, with an average mandate of 2.5 billion dollars, while the other eight portfolio managers had portfolios of close to 1 billion dollars each. The contribution to the equity portfolio's active share in this time period went from 2.14 to 6.4 percent.

The long-short mandates – the new structure (2005)

The sector strategy needed to expand in size and capacity to keep pace with the growth in fund assets. We recruited another three professionals with backgrounds in consumer staples, telecommunications and utilities in 2005, and prepared for another structuring of the mandates.

The sector managers were funded with the full subset of companies in their sector index sleeve but did not follow all the index constituents as closely as our index managers. Corporate actions, index changes and relative value opportunities were sometimes missed. Company insight did not lend itself well to this more market-intrinsic and security-specific activity. The portfolio managers were simply not good at indexing, so we came to regard it as a separate skillset. In addition, there was the challenge of constant sector rebalancing when the relative performance between sector managers changed the relative sector weights.

In 2005, we decided to change the funding and benchmarking structure of the accounts back to where we started in 1999. We moved to long-short portfolios instead of long-only portfolios.

The long-short portfolios included only stocks on which the portfolio manager had a view, either as a long if the view was positive, or as a short if the view was negative. The idea was to encourage an increased focus on the relative active positions in the mandates. In addition, the long-short structure gave portfolio managers more flexibility in sizing positions in stocks where they had a negative view.

Following extensive development internally and by our custodian and back-office provider, the fund opened its first two long-short portfolios in May 2005. Another four followed in June, and the rest were converted in December. The telecommunications and consumer services teams were converted in early summer, while financials, oil and utilities followed at year-end.

The long-short portfolios had, by design, a net asset value of around zero, as the value of the long side was completely offset by the value of the short side. Hence, it is not meaningful to say what proportion of overall equity investments the sector mandates managed. However, the impact on the composition of the overall equity portfolio was stable. The contribution to the equity portfolio's active share in the sector mandates grew in line with the fund through the transition into a new structure in 2005. It also turned out that scaling the long-short mandates in line with the growth in fund assets worked well in this structure in the subsequent years. The contribution to the equity portfolio's active share went from 6.4 percent at the beginning of 2005 to 6.2 percent at the end of 2007.

Developing the strategy 2006–2010

The fund continued to grow, doubling in value from 1 trillion kroner at the beginning of 2005 to 2 trillion three years later. Inflows from the Norwegian government's oil revenue contributed approximately 80 percent of this increase. The rest came from market returns and currency movements.

The global organisation – the international offices (2007)

The number of portfolio managers increased in the following years. We recruited two more in 2006, and another six in 2007, which meant that the team doubled to 21 in the three years to the end of 2007. The team was then stable in size for the next three years, and there were 23 portfolio managers with mandates in the sector strategy at the end of 2010.

Since inception, the idea had been to have portfolio managers work together in small industry teams. Teams of three to five managers, depending on the sector, were considered optimal. Portfolio managers would have their own individual portfolio and make their own investment decisions, while at the same time benefiting from discussing investment ideas among themselves. Responsibility for different parts of the industry was divided among team members, although there was usually some overlap to encourage interaction. An element of competition between team members was considered healthy.

In addition to the five teams from 2004 (finance, telecommunications, consumer services, oil and utilities), we had added an industrial team by 2007 with the recruitment of a basic industries analyst in 2006 and a capital goods analyst in 2007. We also split the financials team into a bank team and an insurance team following the recruitment of two insurance analysts in 2007.

The consumer services team was also expanded to cover most of the consumer sector with the addition of two consumer staples analysts. The only major industries not fully covered by the seven sector teams by now were health care and technology. The bank, consumer and industrials teams each had four portfolio managers by the end of 2010, while the insurance, telecommunications and utilities teams had three, and the oil team only two. Two of the utility sector managers also had an environmental investment account, funded at year-end 2009.

The investment strategy had not only expanded in terms of the number of portfolio managers and the number of teams. The localisation and the structure of the teams had also changed. An important part of the investment strategy was to avoid a separation between specialist expertise and decision making. In the first seven years, only one employee working on the sector mandates did not manage a portfolio. In 2006 and 2007, the fund began hiring a limited number of analysts to support portfolio managers. These positions were for young, talented individuals. Apart from adding support for portfolio managers, the idea was to create an internal pool of future portfolio managers. Some of these analysts did indeed go on to become portfolio managers.

In 2006, we recruited the first portfolio manager to our New York office, and the number of portfolio managers there increased in the following years. We opened our Shanghai office for our equity investments in November 2007. We believed the economic impact from Chinese consumption and production on the companies in our global equity portfolio would be essential to understand for a team of global industry investors over time. We also started to consider investment opportunities in domestically listed Chinese companies.

The fund's profile in global capital markets had grown. There was a clear majority of international portfolio managers among the new hires. Some recruits moved to London from other countries to work for the fund. While seven of the 14 portfolio managers in 2005 were Norwegian, only nine out of 23 were at the end of 2010. Norwegian portfolio managers were now in the minority, and many of them had been recruited in London. The sector teams had become more international both in background and in where the teams were located.

The financial crisis – the strategy rethink (2008)

In the years leading up to 2008, the sector mandates enjoyed several successive years of good results. Returns were about 1 percent higher than the benchmark in each of the five years between 2003 and 2007, except for 2006 when the outperformance was more than 3 percent.

The sector mandates continued to outperform in the first eight months of 2008. That September, the global financial crisis erupted when Lehman Brothers filed for bankruptcy. Stock prices reacted strongly to this turn of events, but the reaction was in no way uniform. While many stocks dropped dramatically in value, others rose in price. The dispersion between stocks was especially large among financial companies.

Overall, the sector mandates were positioned wrongly for these initial share price movements. Some of the largest positions on the long side of the portfolio dropped dramatically in value, while some of the largest on the short side saw share price increases of more than 20 percent. This led to severe losses. In percentage terms, more than half of the outperformance from the preceding nine years was lost in just one month.

Portfolio managers are used to fluctuations in share prices and resulting changes to their portfolios. The movements in the second half of September 2008 were, however, completely unprecedented and far beyond what anybody had ever experienced. Even so, the sector mandates strategy was for the most part maintained.

Equity markets continued to fall over the next five months. Although performance had been exceptionally poor during the initial downturn in September, the sector mandates performed in line with the markets during this period. The markets then started to recover in March 2009, and the sector mandates would go on to outperform every month for the rest of the year.

Most of the monetary loss in 2008 was recovered during the strong rebound in 2009. Over the full period, however, the monetary performance was negative. The performance looks different in percentage terms, as the capital invested was far lower in 2009 than in 2008. Relative performance was positive over the 2008/2009 period measured in percent.

The return volatility during 2008 and 2009 made us reconsider the portfolio structure. We had seen some challenges to the long-short structure in times of crisis. We saw a tendency for portfolio managers to "catch falling knives" and rebalance their portfolio positions by increasing a losing long position rather than cutting a more stable short position. In addition, we experienced a resemblance with hedge-fund positioning, a correlation in return series, and therefore an exposure to risk adjustment and investment capacity for this class of investors.

The long-short structure gave us considerable flexibility, and a clear focus only on companies and risk that we analysed. The structure also lent itself well to pair trades focused on relative price moves between companies, such as the sector mandates tended to have. However, the structure could promote a more trading-oriented investment style that kept the portfolio managers glued to relative market price moves on a shorter-term basis. We preferred to have portfolio managers focusing on company business issues and fundamental analytics, rather than on the equity market and price moves. This would be aligned with the fund's characteristics as a long-term owner of considerable stakes in individual companies. The long-short investment structure would be acutely concerned with the financing of the short positions. A tendency to be correlated with the variation of available risk capacity in the market ensued. These aspects could lead to more concern with market conditions than companies' prospects. It was time for a reset.

The asset size of the sector strategy had not kept pace with the huge increase in the size of the fund's equity investments. In the second half of 2009, the sector mandates contributed just 2 percent to the overall equity portfolio's active share – a level not seen since 2001 when the strategy was still in its infancy.

The long-only mandates – the research lists (2010)

While the sector strategy had been successful in the first ten years, it was clear that there had to be adjustments given the size of the assets and the scale of the equity ownership. The realignment of the strategy emphasised the fund's characteristics as a very large and long-term owner. An increase in investment size would require longer holding periods to generate less trading and reduce market impact.

We decided to change the mandates from a long-short to a long-only structure to reinforce the long-term orientation of the strategy. By the

end of 2009, the portfolio managers were given a new set of long-only accounts in addition to the existing long-short accounts. The total assets in these long-only accounts were 156 billion kroner, or 27.0 billion dollars, at the end of 2009. The seven largest mandates were between 2 and 2.5 billion dollars. These largest mandates were mainly managed by the sector team leads. Another five of the portfolio managers had portfolios of 1 billion dollars each, while the rest had portfolios of 500 million dollars each. The seven largest mandates had 57 percent of assets, while the smallest had 24 percent. A new structure had been installed, and our strategy was developed.

Through 2010, the portfolios were thus a combination, at the time referred to as "130/30 accounts" or "extension accounts". The long-short accounts were disbanded at the end of 2010, except for two portfolio managers who retained their long-short account until April 2011. The dissolution of the long-short accounts was not in line with all portfolio managers' preferences, as some favoured a more hedge fund-type structure with long-short accounts. By the end of 2012, we had 19 sector managers, down from 23 at the end of 2010.

In 2011, we introduced more focused benchmarks. The benchmark typically consisted of 25-30 companies. We called the benchmarks "research lists" to emphasise the fundamental research orientation of the strategy. This was the universe of companies that a portfolio manager was expected to develop deep knowledge about. It could just as well have been called a "shortlist". The list was also the actual funding of the account, and thus in a way a predefined opportunity set for short positions. The structure was meant to combine the best of the long-short and long-only mandate structure – keeping the long-short mandates' focus on a limited number of companies and full flexibility of investment universe, but with the long-only mandates' ownership orientation. The possibility for management to tailor and change the list of coverage, and adjust the relative weight of the different companies in the benchmark, gave the sector strategy an important tool. The structure has remained unchanged to this day.

The active positions increased substantially during 2010, compared to the average level during the last quarter of 2009. The contribution to the equity portfolio's active share went from 1.9 percent to 6.7 percent. This was approximately the same level as prior to the financial crisis. The combined net asset value of the new long-only portfolios was 236 billion kroner, or 40.6 billion dollars, at the end of 2010. The sector mandates thus managed 12.5 percent of overall equity investments. The asset sizes of the individual accounts also changed somewhat, with six mandates at 3 billion dollars and another eight at 1.5 billion dollars, while the nine smallest accounts had 1 billion dollars. The assets had become more evenly distributed, with the six largest portfolios managed by sector team leads now accounting for 43 percent of assets.

100
110
120

Realigning the strategy 2011–2015
During the financial crisis, the fund increased its allocation to equities from 40 to 60 percent. Inflows had also been high for many years. Together, this led to a major increase in the size of the fund's overall equity investments. The dollar value of these investments more than tripled from the end of 2005 to the end of 2009. The fund now owned 1 percent of global equity markets, up from 0.3 percent at the end of 2006, and almost 2 percent of European equities.

The specialist mandates – complementing the sector strategy (2011)

Towards the end of 2009, we evaluated a series of specialist mandates to complement our sector mandates. Then, in 2011, we established three teams outside our sector strategy: a capital strategy team, an environmental team and a China team. From 2013, a listed real estate team was also split out from the specialist capital strategy team and moved out of the equity department altogether. A longer history of these strategies follows in the next chapter.

In November 2010, with a large capital market investment in BlackRock, we established our first capital mandate. Some larger investment opportunities had passed us by, and our market share in equity capital market transactions was low. Investing across sectors and acting on themes that affected several industries were not in the foreground. In addition, some companies did not fit into a sector definition. As a result, we embarked on a new investment strategy, and rapidly established a new team outside the sector strategy.

In December 2009, we established two internal environmental mandates within the sector strategy, one focusing on renewable energy and one on water and waste management. They were managed by two portfolio managers in the utilities team. From January 2011, we formed a dedicated environmental team that was organised within the sector strategy area. The investment scope broadened considerably over time, and investments were made across sectors. The consequence was that the environmental mandates did not naturally belong together with the conventional sector teams. From June 2014, the environmental team was organised together with the other specialist mandates in a new area.

In October 2011, we moved three Hong Kong-based analysts to our Shanghai office. The analysts had been part of the sector department and had a broader research focus than mainland China. Chinese domestic shares, on the other hand, had never been part of the overall sector mandates portfolio. Given the strategic importance of China, and the growth in the domestic Chinese equity market, we decided to manage China A shares more actively, also internally. From June 2012, the analysts' time was dedicated to an internally managed China A portfolio.

The research format – the team structure (2011)

The realignment of the strategy impacted our research activity. The companies on the research list were covered by the portfolio manager on a continuous basis. Coverage responsibilities included developing and maintaining a financial model of the company and meeting senior management regurarly. The research model ensured constant coverage of our largest investments, with less screening of a larger universe for investment ideas.

The new research model also encouraged fundamental and independent research. As the investment horizon increases, share price performance becomes increasingly reliant on

developments in company fundamentals, such as cash generation and earnings. Successful long-term investing is then dependent on understanding how companies will develop over time. We had to sharpen our fundamental research and increase the independence of our research from outside sources.

We decided to create a common research format. This format would serve as a minimum requirement for research, as a communication tool within the teams, and as a corporate memory base. The format included financial modelling, investment cases and company meeting notes. There was also more emphasis on making information available across the organisation and over time. Comprehensive company models with forecasts, notes and other research was stored in a searchable common repository from 2011.

Autonomy had been a core tenet of the strategy from the start. When they were given a mandate, the portfolio managers had considerable leeway in how they went about investing. Research was not standardised across teams, and at times not even within teams. A structured research process was required for anyone with an investment mandate, but the format could be developed individually. The common format implemented from 2011 imposed a standardised process and a required minimum. This was a new way of working, as the autonomy in decision making had to be paired with some commonality in investment processes. The sector strategy was also based on specialisation in research. The common format was therefore not meant to be all-embracing, as the research had to be adapted to the actual sector and the individual portfolio manager.

The establishment of common expectations for research needed to be followed up in individual teams. The size of the overall sector team was by now quite large, and we needed to distribute some of the managerial responsibilities more formally. The role of the team lead as team manager was already established but was formalised from 2012 as part of the investment strategy realignment. We still emphasised that the role should be mentoring more than managing. We thought actual investment decisions would be our version of leading by example.

The new team heads have also always been portfolio managers with their own individual mandate, and this has taken most of their time. As team heads, however, they assumed a co-ordinating role and were responsible for research in their sector, the team's development and the investment results of the overall team. In addition, they were given an important role in the fund's ownership activities.

The ownership role – the ESG data (2011)

Another change in this period was that the fund stepped up its ownership role after it had become a much larger shareholder in many companies. One part of this was that the portfolio managers became more involved in exercising the fund's ownership rights. The realigned strategy placed great emphasis on long-term investment considerations. Governance quality tends to affect companies over time, rather than in the immediate future. Thus, it made sense for portfolio managers to spend more time on corporate governance.

It was common practice among asset managers to separate ownership activities from investment activities. We believed it was possible to achieve better results in both areas by having our ownership team and the sector mandates work more closely together. The increased emphasis on long-term investing also meant that

portfolio managers were expected to develop relationships with companies and to be regarded as a valued discussion partner. Governance would be a natural part of that dialogue. Finally, the fund's ability to exercise its ownership rights benefited greatly from the knowledge and relationships of portfolio managers.

From its establishment in 2005, the ownership team established access to research and data that could also be of value to the equity managers. As soon as portfolio managers became gradually more involved in voting and corporate governance dialogue, such information was shared more systematically. In 2011 we set up a data solution with environmental, social and governance (ESG) information covering about 4,000 of the largest companies the fund was invested in. The user interface was hosted on the platform of an external financial data provider. The database had information from internal and external sources. The aim was to provide easily accessible information that could be used in the fund's investment decisions and to co-ordinate company interaction.

From 2011, portfolio managers assumed responsibility for co-ordinating interaction with the companies under their coverage. As a large investor, the fund enjoys outstanding access to companies. Portfolio managers use this access to develop their understanding of the company. The extensive company meeting activity was an obvious vehicle for discussing governance with companies. Co-ordination of company interaction, by way of single responsibility for a company, would help the fund develop and maintain strong company relationships and convey a consistent perspective from the fund to the company over time.

The involvement of portfolio managers in voting decisions was formalised in 2013. The internal voting guidelines remained the starting point for each vote, but the portfolio manager would contribute fundamental insight so that the fund could make the best decision on how to apply the principles in each case. The purpose was to take more account of company specifics when applying the principles in practice, but also to communicate our views early and well ahead of the annual shareholder meeting. Each portfolio manager had to select five of the companies on his or her research list for participation in the voting process from 2013. This was expanded to at least 15 companies soon thereafter. Overall, portfolio managers have had an important role in exercising the fund's ownership rights through their dialogue with companies and by participating in the voting process.

The internal trade price – risk analytics (2011)

In 2011, we set up an internal trade-pricing system. All sector strategy orders were given a price at the time of the trading decision rather than at the actual market execution. The trading desk would price the portfolio managers' trade orders instantly and for the full volume to be traded. The fund size was now so large that we would use days and weeks to implement portfolio changes, and we did not want the sector portfolio managers to spend time on short-term market developments. This led to numerous discussions internally about trade cost and market impact. The internal pricing structure also influenced the pace of portfolio adjustments. This led to further analytics on the timing aspect of investment decision making. The decision analytics would typically consider price moves 30 days before and after a trade order, looking at momentum and reversal, to slow down or speed up trading and to improve investment decision making.

We have strengthened our quantitative analysis of the individual mandates and the aggregate sector strategy portfolio over the years. This includes the analysis of portfolio exposures over time, risk factor characteristics, decision analytics and trading costs. The analysis impacts the capital allocation across portfolio managers and provides direction for individual development. By 2011, we had more than a five-year track record of portfolio management, returns and trading for half of the then 22 portfolio managers. More work on funding size and combination of mandates was conducted. We also had more data to work on for individual decision analytics. In that same year of 2011, the sector area started to build up additional risk analytics with dedicated resources separate from the fund's risk department.

Risk factors were a recurring topic in the discussion around the fund. Discussions with academia centred around "risk factor adjustments of relative return". From 2013, our policy portfolio implemented a risk factor overlay to complement our investment strategies. The discussion around risk factors and exposures in the sector strategy was constant. We had observed a correlation over the years between our sector strategy relative returns and hedge fund returns, and at times also market returns. There was also a tendency for the managers' relative return to be exposed to how well their sector performed relative to the market. This "sector beta" seemed to be structural. The research list could to some extent be used for risk management considerations, but direct restrictions in investment mandates were limited. The risk analytics mainly impacted the portfolios through the deliberations and assessments following investment decisions.

The overlay portfolios – the extended research (2013)

In 2013, we funded two overlay portfolios that invested in companies in several industries. There were limits to how much company-specific risk a portfolio manager would take, and the overlay structure was set up to facilitate scaling of selected positions. The investment in single companies could be increased, while keeping the diversification in the individual mandates. In addition, the overlay portfolio would create more interaction and investment discussion between teams, without reducing the individual portfolio manager's discretion in his or her own investment mandate.

The investments in the overlay mandates were based on the largest company holdings in the sector mandates and were discussed in an investment meeting with the individual portfolio manager and the lead sector managers. The portfolio was built up to 4.6 billion dollars at the end of 2013 and 5.9 billion dollars at the end of 2014, accounting for 10.6 percent of the sector strategy assets. The portfolio then had 19 investments, with modest sector deviations.

The relative returns showed larger variation with the underlying returns on the core sector mandates than we had expected beforehand, and hence did not represent a simple scaling of the returns in the individual sector mandates. By the end of the following year, the assets had halved to 2.5 billion dollars, and they halved again to 1.1 billion dollars by the end of 2017. This was just below 2 percent of the net asset value in sector mandates, a level the account has been kept at since. The mandates have increased interaction between the portfolio managers and challenged the investment views held. The overlay portfolio has also enhanced the visibility of different investment approaches. This has been valuable for capital allocation and people development.

Company access was in many ways our competitive edge, and we acted as representatives of the fund through these meetings. The number, format and quality of our company meetings were always a concern. In 2013, we established a dedicated corporate access team to facilitate meetings between portfolio managers and companies, and to increase companies' knowledge about the fund.

We increasingly met companies on our own initiative, and often on the company's premises. This allowed us to meet a more targeted selection of management outside the company's normal investor roadshow schedule. We tried when possible to combine visiting a series of companies, their competitors and suppliers, and local regulators and experts. Company meetings had become a differentiating source of information and a competitive edge for the fund's portfolio managers.

In 2014, we established a primary research team to work with portfolio managers in developing research hypotheses and decide on external procurement of targeted data. The commissioning of external parties to harvest data had by 2016 increased our proprietary research and was scaled as needed. With these improved capabilities within primary research, we further reduced the use of investment bank equity research. We also continued to draw heavily on expert networks.

The recruitment restart – covering all sectors (2015)

By the end of 2012, the realignment of the investment strategy was largely complete. The foundations were in place to scale up the investments of the sector mandates further. However, the number of portfolio managers had declined to 19, below the level in 2007, while the fund had become much bigger.

We stepped up recruitment over the following years. By the end of 2016, the sector strategy had 32 portfolio managers, a level it has stayed at since. The number of managers increased the most in 2015 when the mandates in the sector strategy grew from 22 to 29. The target was investment professionals who would have an investment approach suited to the increased size of the fund, and strong skills in the financial modelling of companies. An industry specialisation was a requirement, and we decided to recruit in the deep and specialised labour markets of London and New York. In contrast to the first few years, only one of the recruits from the 2013-2016 period was Norwegian. From 2017, the number of Norwegian portfolio managers increased again as a result of the investment talent programme we set up in 2010.

By the end of 2010, the assets in the strategy had reached 236 billion kroner, or 40 billion dollars. They kept steady at 40 billion dollars until the end of 2012. This corresponded to 9.6 percent of overall equity investments. The contribution to the equity portfolio's active share was 3.9 percent. The 2014-2016 Strategy Plan approved by Norges Bank's Executive Board in early autumn 2013 aimed for an increase in the active management of the fund. At year-end 2013, the sector strategy assets had increased to 315 billion kroner, or 51.9 billion dollars, which was 10.1 percent of the fund's equity investments. The contribution to the equity portfolio's active share had risen to 4.9 percent. In 2014 and 2015, the sector mandates continued to manage just over 10 percent of the fund's equity investments and contributed 5 percent to the equity portfolio's active share.

The assets increased to 420 billion kroner at the end of 2014. The asset growth was smaller in international currency, as the krone weakened

during the oil price fall in 2014, ending the year at 56 billion dollars. The assets in the sector strategy were stable in the following years and came to 56 billion dollars also at the end of 2018.

In 2015, we recruited a health care portfolio manager, and a new sector team was started up. We now for the first time covered all main market sectors in which the fund had investments. This reflected the emphasis on our ownership responsibilities, and the need to cover all our major investments for risk assessment purposes. The teams had considerable experience and adequate research capacity. The basic industries team had six portfolio managers, the banks team and the consumer team each had five portfolio managers, while the industrials, insurance and telecommunications teams each had three portfolio managers, and the newly started health care team only had two portfolio managers.

The mandates were given additional, albeit selective, funding in this period. At the end of 2015, the 29 mandates again had quite large variations in assets, with a concentration of assets with the team heads. The seven largest portfolios managed 61 percent of the sector strategy. The lead portfolio managers had average mandate sizes of 5 billion dollars, but they now ranged from 3 to 7 billion dollars. Another 19 managers each had assets of 1 billion dollars, while the last three had 500 million dollars as they were in a build-up phase.

Refining the strategy 2016—2020

The fund's assets continued to grow, hitting 10 trillion kroner on 25 October 2019. The fund had increased the strategic target to a 70 percent allocation to equities in 2017, which was reached in 2019. The five years starting in 2016 would be a period of consolidation in the sector strategy. Important priorities included developing trainees and analysts into portfolio managers, improving information sources and analytics, and adjusting the allocation of capital across the mandates.

The strategy consolidation – renewing the teams (2016)

The number of portfolio managers was stable at around 30 throughout the period, while there was a marked increase in capital towards the end of the decade An important source of new portfolio managers was candidates from the investment talent program. At the end of 2020, five of the sector portfolio managers had come from the programme. This contributed to a renewal of the portfolio manager group during this period, and a change in back-ground and experience. At the start of the period, only two of the sector portfolio managers had had a background as a recent graduate when they joined the fund, whereas at the end of the period 12 of the portfolio managers had this background when joining the organisation.

Placements for trainees in the investment talent programme had already increased the number of investment professionals in the sector teams for a few years. They would be given a role as an analyst on an industry team, with the objective of progressing to a portfolio manager role. From 2017, there was a step up in new analyst team members from the trainee programme. The development of these young analysts into portfolio managers was helped by the contributions from the industry team heads and dedicated senior portfolio managers.

In 2018, we decided to merge the utilities team into the environmental team, and the oil team followed in 2019. The idea was to get a more holistic approach to the energy transition that the global energy complex was entering. With two fewer teams, we were then back to seven sector teams again.

Going into 2016, the sector mandates had assets of 465 billion kroner, or 52.5 billion dollars. This was 10.2 percent of the fund's equity assets. Three years later, at the end of 2018, assets were around the same level at 483 billion kroner, or 55.8 billion dollars. However, with the growth in the fund's size, the sector mandates now accounted for only 8.8 percent of the fund's equity assets, with a contribution to the equity portfolio's active share of 3.8 percent.

The research extension – the Europe focus (2016)

In 2016, we undertook a series of initiatives to improve how we value companies, taking our company models as the starting point. An expert in valuation and accounting had provided in-depth and detailed training starting from 2013, and we rolled out a proprietary common template for discounted cash flow valuation in 2017. Rather than interpolating near-term earnings assessments, the format targeted long-term developments such as capital allocation and margin developments. It thus supported our ownership role with the focus on longer-term strategic issues.

In 2016, the ownership team launched a new solution to integrate environmental and social data with financial data in a single source that could be used by the entire organisation. The data included corporate governance data and board composition. In 2020, the platform was extended to include additional corporate governance issues, including CEO remuneration, voting records with rationale, and shareholder data. The database covers all the 9,000 companies in which the fund invests.

We continued to increase the share of one-on-one company meetings we organised ourselves from around half at the start of the period to around three out of four at the end of the period. We also extended our training in how to run meetings and how best to broach important issues with management.

Dependency on other parties for research decreased as our own capabilities increased. In the last five-year period, spending on investment bank equity research was reduced by two-thirds. The use of experts mobilized through expert networks remained at a high level. We also continued to develop our own capabilities within primary research.

The sharper focus on the fund as a major owner led to an increased emphasis on Europe for the sector strategy. The fund was also more recognised in the markets and among companies in Europe, and the investment results had also been stronger in Europe than in other parts of the world. The benchmark weight for Europe was increased in this period. Going into 2016, 50 percent of the combined benchmark consisted of European companies, while by the middle of 2018 it approached 70 percent. At the end of 2020, the aggregate benchmark weight in European companies had, however, decreased to 58 percent. This was to some extent due to the stronger performance of the US market, but also to the increased funding of more US-oriented industries such as technology.

The growth in assets – the mandate allocation (2019)

The 2020-2022 Strategy Plan approved by Norges Bank's Executive Board in the autumn of 2019 aimed for the internal active mandates to increase to 15 percent of equity assets. At the time, the fund had just transitioned to the higher 70 percent equity allocation, and equity assets returned 26 percent in 2019. A doubling of assets in the sector strategy followed. Assets reached 630 billion kroner, or 72 billion dollars, at the end of 2019, and 889 billion kroner, or just

above 100 billion dollars, at the end of 2020. The strategy still only increased from 8.8 to 11.2 percent of equity assets, and the contribution to the equity portfolio's active share was just 4.13 percent.

We increased the analysis of individual portfolios and the overall combination of mandates. In addition to analysing the investment results over time, we focused on portfolio exposures, risk factor characteristics, and trading costs. While the larger asset base increased the potential for adding value net of costs, it also increased the importance of trading costs due to market impact, and the demands on the investment approach of the portfolio managers.

We refined the framework for capital allocation, and incorporated assessments of the research quality for each portfolio manager more systematically. The capital allocation would be driven by expected relative return, while at the same time we tried to avoid step changes from year to year to reduce timing risk and implementation costs.

The analytical work impacted the capital allocation across portfolio managers, and the distribution of assets and size of the mandates changed considerably during these two years. By the end of 2019, the four largest mandates managed 31.1 billion dollars, or 44 percent of assets. The next six managed another 20.1 billion dollars, or 29 percent of assets. With average assets above 5 billion dollars, these ten were significant mandates. In addition, we had 13 mandates with assets in the 1 to 1.5 billion dollar range, and six mandates of 500 million dollars. The latter were mainly the portfolio managers stepping up from an analyst role and with a background in the investment trainee programme.

The risk taking should ideally not be dominated by a few mandates. We assessed capacity issues and marginal contribution to downside risk. By the end of 2020, the four largest mandates had the same average mandate size at 8 billion dollars, but the next six had nearly doubled their average assets to 6 billion dollars. With another five managers with assets between 2 and 3 billion dollars, the mandates were now more evenly spread out. In addition, we had ten mandates with assets in the 1 to 1.5 billion dollar range, and the youngest portfolio managers had been funded up to this level.

While assets increased considerably in the last two years to the end of 2020, the number of portfolio managers was stable. At the end of 2020, we had 30 specialist sector portfolio managers and a small number of analysts, organised into seven teams covering all major industries. Most of the investment professionals worked out of our London office, but we also had a sizeable presence in New York. They all managed investment portfolios with considerable autonomy under clearly defined investment mandates.

The focus remained on large companies in developed markets, including most major European companies. Our portfolio managers covered around 600 companies, representing 52 percent of the fund's benchmark by market capitalisation. Together, the portfolio managers in the sector strategy managed 889 billion kroner, or just above 100 billion dollars, at the end of 2020, which was 11.2 percent of the fund's equity investments.

Chart 17 Sector. Net asset value by broad industry grouping. Assumption made to convert capital base during long/short period. Billion kroner.

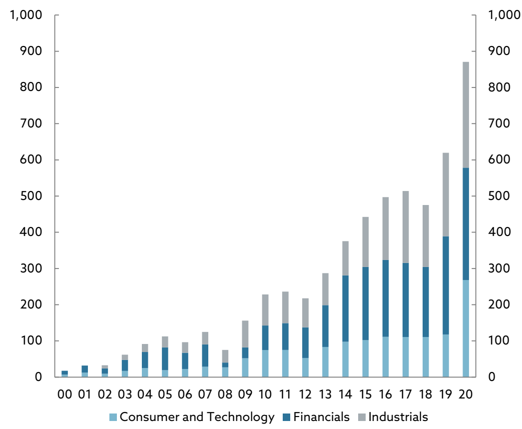


Chart 18 Number of mandates by broad industry grouping.

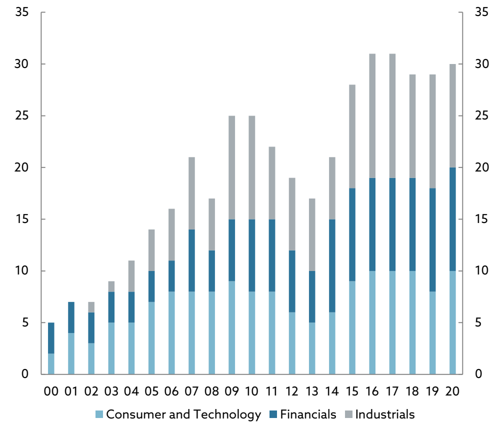


Chart 19 Market value of overweights. Billion kroner.

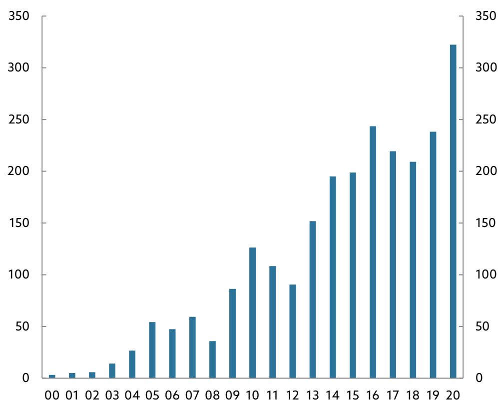


Chart 20 Contribution to the overall equity fund's active share. Percent.

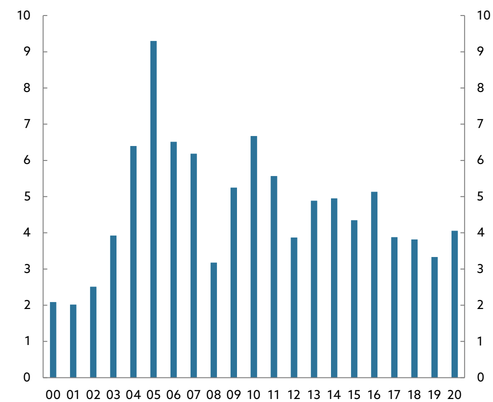


Chart 21 Percent of benchmark companies in the aggregate portfolio.

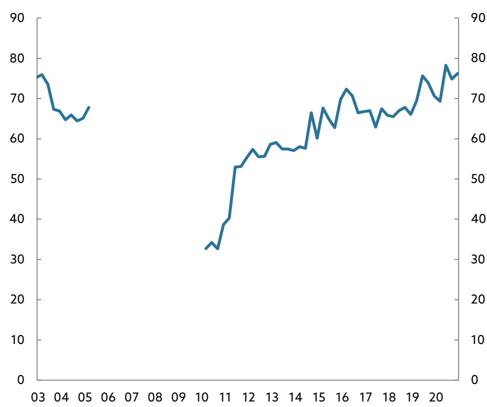


Chart 22 Median number of companies across mandates.

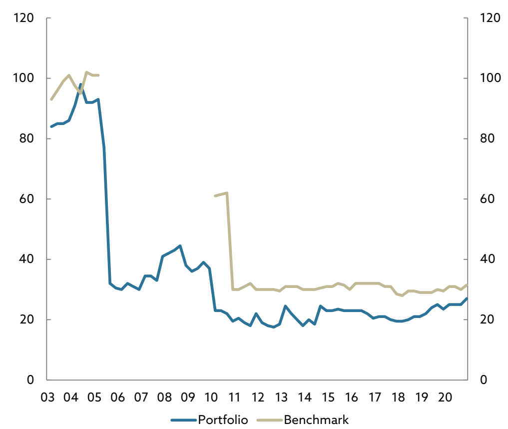
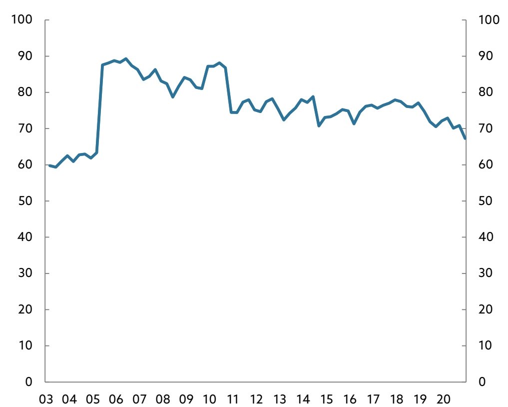


Chart 23 Active share of the aggregate portfolio. Percent.

Chart 24 Average share of top ten holdings across mandates. Percent.



The management

We have recruited an international group of professionals who analyse companies in detail and make investment decisions with a long-term perspective. We selected our investment universe with care, based our investment decisions on industry insight, and combined the many individual mandates into a combined investment strategy.

The investment industry is often evaluated along four dimensions: people, process, portfolio and performance. The last of these we will look at in its own section – after all, good returns are the purpose of it all, not the investment management in itself. This section considers the other three.

Investment is a knowledge business, so we need the right people working in the right team setting. Even more, we need them to work in the right way and continue to improve the way we invest. And last, we need to put it all together in clear and well-defined investment mandates that make sense both individually and collectively as a combined investment strategy.

The people

People are the essence of any successful investment strategy. We have recruited an international group of talents with deep know-ledge in their field. We have tried to give them the best of opportunities to develop as investors, to make better investment decisions, and to improve through their work and in a competent and diverse team. We have to recruit, develop and support our portfolio managers to create value.

Recruiting analysts – specialisation and autonomy

Over the years, we have looked for people with a global mindset to build an international organisation. We have recruited people with an industry background to build a specialist organisation. We have looked for decision aptitude to build an investment organisation. And we have always recruited likeable people of great integrity with whom we have wanted to work to build a good organisation.

Internationals – for a global fund

The establishment of the London office, and thus the internationalisation of the organisation, was a source of debate even in the fund's leader group in the early years. The view from the equity side was that Oslo would be neither an adequate recruitment pool nor an ideal place to run a global equity team. The discussion ended with the opening of the London office in August 2000, and the head of equities relocated to London from 2001. The desire to target experienced hires with a sector background was an important factor in setting up the office. We were closer to global capital markets and could look for professionals from a much larger talent pool with specialist experience across sectors. The office would also be a platform for attracting and developing Norwegian employees.

We have always looked to recruit a combination of international, experienced professionals and younger Norwegians. The first portfolio managers in the sector team in 1999 were recent graduates, recruited in Oslo, and we had them move to London in 2000. We did not at the time require an analyst background or specialist sector expertise. It was less about existing skills and more about their research and investment potential. In the first years in London, we made a concerted effort to expand the Norwegian staffing in our sector team. With some assistance from our investment bank contacts, we scoured the London market for young Norwegian analysts with the right portfolio management aptitude. The typical recruit we looked for had three to five years' experience as an equity analyst in an investment bank.

Having established a base of Norwegian portfolio managers, we moved on to create an international fund management team. By 2007, half of the portfolio managers were Norwegians, but the share declined in the following years to four in ten. After a recruitment drive in 2014 and 2015, it fell further to one in six. With the more recent award of mandates to analysts from the trainee programme we started in 2010, we were back to one in three at the end of 2020.

The international recruits who came from investment banks and fund managers were generally not locals. We recruited people with an international background, either through work or studies, and looked for a global mindset. These were mainly younger professionals aspiring to an international career. We thought the diverse nationalities and backgrounds would be conducive to investing in global companies, and an advantage when interacting with multinational companies and searching for information across the globe. Even in our recruitment of dedicated China analysts, where local background and understanding were what we looked for, we have insisted on a global mindset and an international background.

Professionals – for a large fund

The principle of combining the roles of analyst and portfolio manager had important implications for recruitment. Candidates would need to be able to fulfil both functions, and hence have or be able to develop the right skill set in both areas. We could not require experience in running assets, as this would severely limit the pool of candidates and be challenging as regards remuneration. The recruits therefore generally had an analyst background and knew the craft of equity research. In addition, a relevant industry background was required for the experienced hires.

Many of our hires came from a role as an analyst in the equity research department of an investment bank. They would have developed strong knowledge about the industry they were covering, and they would often have a career

ambition to transition to an investment role. We could offer a transition with a high degree of autonomy and without a burden of marketing. Recruits also included candidates who transitioned from an analyst role with an asset manager. They would appreciate the combination of an independent role, our considerable assets under management, and the stability of investment capital that we were able to offer.

Some skills that other asset managers would be looking for, such as marketing skills or an ability to argue an investment case to a set of internal portfolio managers, would not be required, as we managed our own assets and offered autonomy in the investment role. We looked for people who would be good at numbers rather than good at telling stories, and we recruited people with an analytical mindset. The extroverts would not need to be in the majority. Persistence would be chosen over pliability, and independence of mind over adaptability of perspective.

In order to attract and retain investment professionals of high quality, the combination of the role offered, development opportunities and remuneration needed to be competitive. The investment industry is characterised by high levels of pay, but also large variations depending on role and type of organisation. What we offered, and was appreciated by many investment professionals, was autonomy in the role, a specialised and well-defined investment mandate, and excellent access to the companies we invest in. This would be the base for investment outperformance, which is important for anyone trying to build and maintain a career as a portfolio manager. Today, with a larger organisation, experienced hires remain important in order to sustain investment capacity and embrace new approaches. They ensure that we have a suitable ratio between more experienced investment professionals and the younger colleagues recruited through our graduate programme, which has been an important source of new portfolio managers in recent years.

Investors – for a long-term fund

Several aspects made our global sector mandate roles attractive to analysts with portfolio manager aspirations. Most importantly, they would be able to use their industry knowledge directly in running specialised investment mandates. The path to a more traditional generalist portfolio manager role in other organisations would be longer and less direct. Their research range would also be expanded, as they would typically have covered fewer than ten companies, often limited to one region or even just one country, in their previous analyst role. This provided scope for professional development also on the research side.

In addition, we offered a sole focus on investing, with no marketing or report-writing requirements. In the first decade, we also offered an unusual degree of autonomy, even in the research work. In practice, we offered the room to shape their investment process and tailor this to their competitive strengths. As the fund grew and the organisation matured, we offered unrivalled access to the largest companies in the world, the brand of one of the largest fund managers in the world, and an opportunity to learn from experienced specialist portfolio managers and generous colleagues. All these factors would increase the chances of success.

Assessing who could make the transition from an analyst role to a combined analyst and portfolio manager role was the key part of the recruitment process. We took some learning points from the selection of external managers. In 2001, we funded the first external managers

with sector mandates. As these were typically not developed products, we had to search and find the portfolio managers among the analysts within these organisations. The same framework, interviews and analytics were used for our early recruits. The equity division's external mandate team was also located at our London office in the early years.

We needed to evaluate whether the candidate had what might be called a portfolio manager mindset. The recruits should be adept at researching companies, but making the right investment decisions would be the key success criterion. We needed people who were intellectually curious yet critical, independently minded yet humble, and clear in their assessments yet able to reconsider information, revise views and admit mistakes. They had to move beyond the craft of research to the art of investing.

Chart 25 Number of portfolio managers by location.

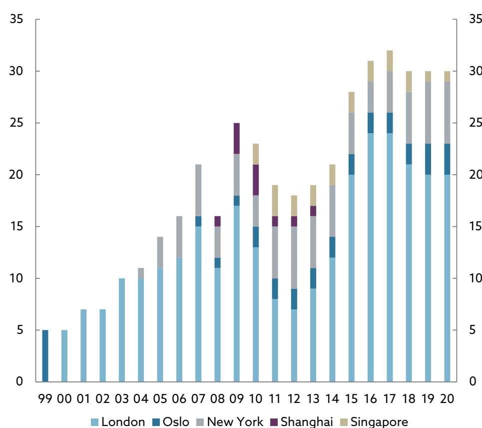
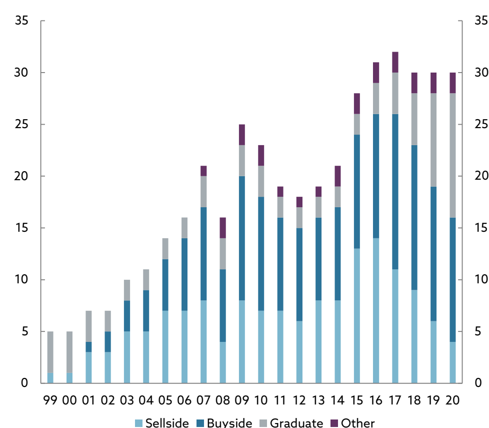


Chart 26 Number of portfolio managers by background prior to joining Norges Bank Investment Management.



Developing portfolio managers – delegation and diversification

We would provide risk capital to a portfolio manager to see if we could turn an analyst into an investor. We would require a high level of knowledge of the companies that should be invested in, and have an expectation of positive and consistent investment results within a reasonable period of time.

Track – developing the layers

The analysts we recruited first of all learned through their company research. They would be investing in an industry they knew, and we tailored their investment universe to their area of knowledge to increase the chances of achieving good results. Over time, we expanded their research area. In addition, we tried to push for new forms of research and encouraged innovation by underscoring changes to the process. We would aim for business knowledge, employing expert networks, scoping the full value chain, interacting with the second organisational level in the companies, and ensuring questioning of the long-term strategy of the company.

The independent investment mandate combined with independence in the investment process was the second layer. The portfolio managers would focus only on investing, with no other responsibilities, and be sheltered from market noise, as our traders were responsible for both the market interface and execution prices through our trading books. We made sure the portfolio managers were presented with risk and trade analytics to make decision processes more conscious, and we offered meticulous measurement and evaluation of results to ensure they learned from both successes and failures. We could not recruit experienced portfolio managers with established track records, but we provided patient capital to avoid short-term thinking. We let the managers develop their best ability with flexibility and individualisation of the investment process, allowing the managers to use their competitive advantage when possible.

The third layer was the interaction with the other members of their sector team. This developed over the years. In the first decade, we prioritised autonomy in all areas. The team format sharpened competition, their assets and experience were comparable, and there were limited role divisions. In the last decade, we have tended more towards collaboration and have introduced more role divisions, with trainees, younger analysts, team leads as mentors, and team heads as co-ordinators. Early on, we would systematically recruit different personalities and cater for different investment styles, as we assumed the differences would both test the investment cases and balance our market approach. We also thought this would encourage more work on the investment cases and desensitise the combined portfolio's exposure to risk factors, macro cycles and other aspects that we could not control. Today, we put more weight on diversity and differences in background.

The last layer has been greater portfolio manager involvement in our ownership role over the last decade. We ensured from 2011 that the portfolio manager contributed to the ownership process. In 2013, we also strengthened our corporate and management relationships through a dedicated corporate access team that would ensure a direct and continuous interface with companies' investor relations departments. We would also format our company meetings as a representative of an owner, and at times arrange meetings at company board level. This ownership role developed the thinking around our investments. Leaning towards thinking as an owner would mature and broaden our

investment perspective. The investment role would, through this ownership role, be consequential and serious. We would not only have access to companies but also, as a large owner, at times be listened to. Expectations of companies from society and investors have also increased over time, especially in the last five years. The COP 21 climate conference in Paris in November 2015 was a watershed moment also for the fund management community.

Tenure - developing over time

To invest in an up-and-coming portfolio manager is first of all to invest risk capital through a mandate. We would develop investors to reap common benefits over time. Patience was essential; acceptance of early investment misses high.

The mandate horizon was originally set at three years. We typically funded with 250 million dollars, and assets were usually assured and stable in these first three years. Performance in the first year was not thought to be an important factor when predicting later performance. With a larger fund today, we will fund new mandates with 1 billion dollars, and they may be five times this size within the first three years.

Giving the managers a window of three years to develop has been essential to ensure an investment orientation towards building deep company knowledge rather than an insight into market vagaries. It has induced an investment strategy directed towards issues that matter to longer-term outcomes for companies. The definition of coverage, variation in funding and restrictions in the investment mandates would ensure overall risk management. The incentive structures were also designed for three-year relative return numbers and with a stepwise withholding period.

We thought early on that we would keep our portfolio managers for an average of five years given the high turnover in the fund management industry. In fact, our portfolio managers ended up staying longer, and we have had a turnover well below 20 percent. The expected mandate tenure approached ten years. Even among those who have left, the average mandate tenure has been above five years. The expected growth in assets in their mandate, the unrivalled company access and the wide-ranging company and industry research opportunities have been central in retaining successful portfolio managers. The opportunity to do nothing but invest and not be encumbered with other tasks was appreciated.

We have tried to offer and develop a good working environment with a flat, frank and open organisation. The personalities we sought were collected and dedicated professionals who were genuinely interested in investing. We recruited people that we would like to work with, diverse personalities working in an environment with a single purpose and a single owner. With most support functions in Oslo, we were able to keep an investment boutique feeling in small international offices that at the same time managed very large assets. These offices had no other role besides investing, and portfolio managers outnumbered all other functions. Tenure may have exceeded our expectations due to the sole focus on investing in a working environment with likeable and professional colleagues who loved investing.

Trainees – developing from scratch

The most important path for developing portfolio managers over the last decade has been recruiting young analysts into a sector team and giving them the opportunity to learn from experienced portfolio managers. As the

organisation matured, we started to recruit younger analysts. We recruited four analysts to support our portfolio managers in 2006 and 2007 who all went on to become portfolio managers themselves. Another three recruited to analyst positions in 2012 also became portfolio managers in due course.

The sector strategy reset after the first decade included an additional track for long-term development of portfolio managers. In 2010, we set up a formal trainee programme with the purpose of recruiting and developing candidates for future portfolio manager positions. The programme consisted of a first year in Oslo to understand the full cycle of investment support functions, a second year in the research department of a large investment bank in London, and a third year placed with one of our sector mandates teams in London. In the first eight years, a total of 38 candidates started in the programme. By 2019, we had a sizeable pipeline of young investment professionals having worked as analysts, and five participants in the programme had attained a sector portfolio manager role. The mentoring required substantial input from experienced portfolio managers and industry team heads, and we did experience some mentoring capacity issues.

Chart 27 Norwegian portfolio managers. Share of total. Percent.

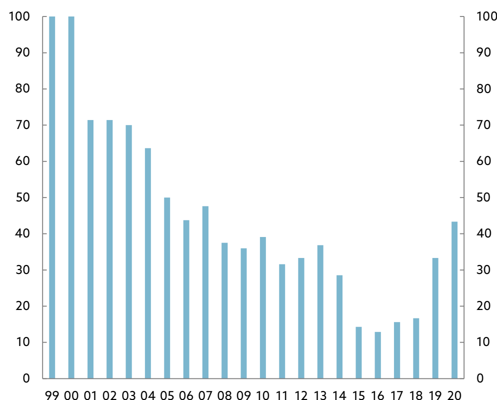
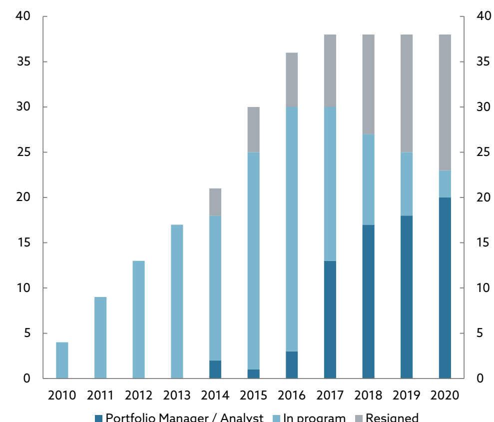


Chart 28 Number of participants through investment talent programme.



Building sector teams – competition and collaboration

Having portfolio managers work together in industry teams was the idea right from the beginning. The team would focus on one large industry or a set of related industries. Each portfolio manager would have his or her own portfolio and make investment decisions, while at the same time benefiting from discussing investment ideas and other investment issues.

Team coverage

The investment universe for a sector team would be made up of companies in one large industry or various related industries. To illustrate, the investment universe for our basic industries team was made up of companies in various industries, primarily in metals and mining, building materials, chemicals and autos. This investment universe would span large parts of the relevant value chains. A portfolio manager's specialist knowledge in a set of companies would be enhanced by the overall team's understanding of suppliers and customers. For example, the requirements to reduce vehicle emissions faced by the automotive industry would have significant implications for some chemical, metal and mining companies. Polymers might replace metals to reduce weight, and battery chemistry would be important for the range and performance of electric vehicles.

From the outset, the investment mandates have been individual and mirrored in a research responsibility for most of the companies the manager invests in. Individual accountability has therefore been considerable. Responsibility for different parts of the industry was divided among team members, although there would usually be some overlap to encourage interaction. Team heads could also capitalise on the combined team's research by scaling up the positions in the other portfolios.

Team dynamics

We saw several advantages in organising specialist portfolio managers with investment autonomy into industry teams. It encouraged discussion of a broader investment universe and a sharing of best practices in research and portfolio implementation. It promoted collaboration, facilitated debate of investment ideas and ensured business continuity.

We started out with a limited team structure and independent mandates that had similar asset sizes and considerable overlaps in their investment universe. This encouraged friendly competition, but also a gradual scaling of investment positions. Typically, the first manager would start building a position which would subsequently be revisited by the others as the performance and investment case developed. This assured less price point vulnerability and more sequential testing of the investment case. The end-result could be higher-conviction investments or a gradual reduction of investment exposure.

The size of the teams was mostly small until 2009, and the structure of the teams was quite loose. The portfolio managers enjoyed a large degree of autonomy. They would often invest in the same companies due to the large overlaps in their investment universes. The companies they covered would often represent different parts of the same value chains, or related business models or industry segments. This created a natural incentive for portfolio managers to exchange information, debate investment considerations and collaborate in other ways.

Over time, as we built larger teams with wider divergence in experience, we put more weight on the mentoring of younger team members. The industry team structure was tuned to help achieve these objectives. We have consequently

over the last two decades moved the team dynamics from loose to structured and from competitive to collaborative. We have seen advantages and challenges with both versions. An important challenge has been to find the right balance in a team between individual autonomy and management direction, and thus ensuring individual convictions even with common research.

Team structure

Over the last two decades, we have moved our team structure from flat to layered, and from parallel to complementary roles.

We recruited our first full-time internal analysts in 2006. In addition, we set up a structure with sector-dedicated outsourced analysts from Mumbai from 2006, and then from Hong Kong in 2009. This led to a role for a lead portfolio manager in each sector team co-ordinating the research undertaken and ensuring common formats for the research delivered.

With the strategy realignment in 2011, we developed the role of the team lead further. The common research format and the introduction of research lists with defined coverage in 2011 needed follow-up in the individual teams. The common format for all our sector teams' company research required further co-ordination. The research lists ensured a defined company coverage and a prime research responsibility, and produced research that would be available to the whole organisation.

From 2012, we introduced a formal team head role. We extended the mentor role for the new analysts, and in the same year also for the first trainees in their third programme year. This in effect changed the team lead role into a team management role. The team head was responsible for the research analysts' path to a portfolio manager role, and therefore also their progress and continued team membership. The team heads played a central role in team development and in the hiring of new portfolio managers for the team.

The team heads were also given a special role in company interaction that involved company board representatives.

From 2015, the larger team sizes expanded the management role. The team heads have always been portfolio managers with their own individual mandates, and this should take most of their time. We insisted that the team heads should interact with the other team members mainly as an investor. They had responsibility for the investment results and for aligning research in the overall team towards value creation. Still, the assets were more unevenly distributed. Risk analytics used to be offered as a service to the portfolio managers, but now also functioned as a risk management tool for the team leaders.

In many ways, we walked backwards into establishing the team manager role. We had always wanted a flat organisation and truly independent mandates. A team head should foster trust and co-operation amongst team members and encourage information sharing. The challenge would be to provide space for autonomy and independence for the portfolio managers, while also providing guidance when appropriate. The team heads themselves needed to strike the right balance between efforts directly related to their own investment mandate, and spending time on activities or interaction at the team level.

The process

The investment process is in many ways the core of any investment management activity. The sector strategy is based on knowing companies in depth. Our portfolio managers seek to understand how companies create value, what their prospects are, and what business risks they may face. They combine this understanding with capital market insight to make investment decisions.

The information sources – selecting and extending

The combination of how we select information sources and gather information, and how we refine and use the information obtained for assessing companies, is the base of our investment process. We seek information that is differentiated and adapted to the fund's characteristics as a long-term owner. We pursue better selection of sources, better quality of information and better processing of information to have a fair chance at creating value. To generate a knowledge advantage, we need more or deeper information that is relevant for a longer time horizon, and a process to select the information better or analyse it better.

Selecting information – market research

When we first started to research companies two decades ago, we had little experience and limited internal capabilities. At that time, investment bank research was the most important source of information. An enormous amount of research is published by the research departments of the investment banks every day. Like most other investment managers, our portfolio managers would lean on this research. We have consciously become less reliant on this investment bank research over time, expanding our information sources and building our own capabilities.

The industry standard at the time we started was to pay for research indirectly through trade commissions. However, the investment bank we might want to use for trading was not necessarily the one we might want to receive research from. To get access to the research we wanted, while at the same time securing the best execution of trades, we effectively started to pay for research and execution of trades separately from 2006. We gave detailed feedback to the investment banks with price points for each investment bank analyst considering the calls, meetings and research report we received. The aim was to foster an internal discipline of defining what we wanted, be conscious of what added value, obtain a more tailored product from the investment banks, and have a rational process for commission payments.

The main reason for reducing the use of broker research over the years has been that this research is widely available. It is hard to make better investment decisions than others if you rely on the same information and discuss the same views as other investors in the market. Even the best information and analytics are at risk of being recycled and watered down in a closed circuit of market participants. Today, we do not rely on broker research. We still use it to some extent, but it is not a core part of our research process.

Extending information – developing new sources

From 2007, we started to gather information from expert networks. The organiser of an expert network can set up a meeting between our portfolio managers and an expert in just about any field. We had some concerns about the possibility of the expert revealing sensitive information, and we developed a rigorous compliance assessment procedure. Interacting with experts through these networks has proven valuable, and we use them extensively to this day.

From 2014, we transferred resources to our own primary research team. The idea was to provide bespoke research exclusively for our portfolio managers, differentiated from information already considered by investment banks or other research providers. The primary research team worked with portfolio managers to develop research hypotheses. They then procured the desired data from diverse external sources. The commissioning of external parties to harvest data augmented our research capacity in a way that could be directed and scaled as needed. Large data sets have been onboarded for internal analysis on topics such as pharmaceutical sales, mobile phone usage, smartphone app usage, energy consumption and international shipping.

We continue to look for information which is hard to access. We pay for specialist research and use expert networks, and our internal primary research team has expanded our own independent research capabilities.

Chart 29 Number of companies covered by region.

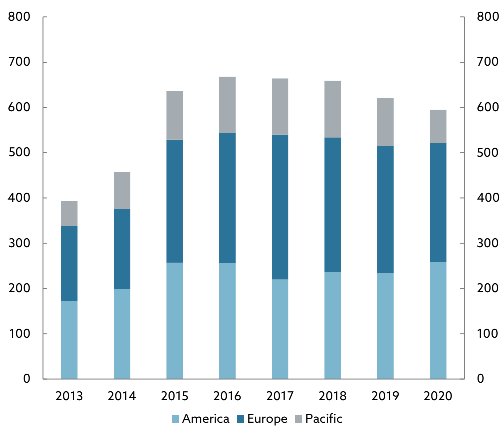
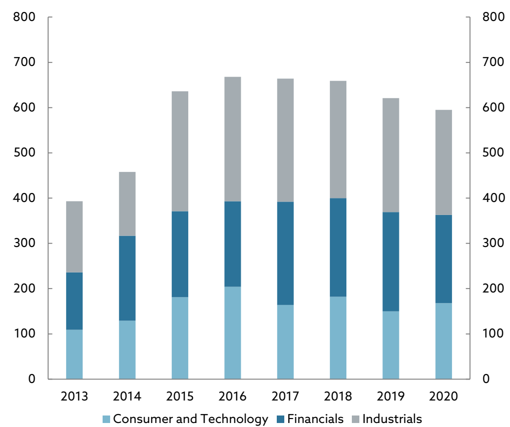


Chart 30 Number of companies covered by broad industry grouping.



The research framework – focus and format

To create excess return, the combination of how we analyse our information, develop investment views, and then implement these views through trades in the market, had to be better than the market. We needed to know more or to understand what others did not. We wanted to develop insight through better knowledge and a process that allowed our information to be analysed and understood better.

Research focus

We decided early on not to have dedicated analysts. The mantra was that the portfolio manager was the analyst. This had the important implication that the person closest to the information took the investment decisions.

Specialising along industry lines made research more efficient and focused. Each portfolio manager running a sector mandate made investments in only one industry or a small set of related industries. This was a foundation for developing skill. Companies that belonged to the same industry tended to have more in common than companies that belonged to the same country. This was especially true for the larger companies, which were becoming more international and therefore less dependent on their home market.

We realigned the research framework after the first ten years. By 2010, our equity investments had become much larger as the strategic allocation to equities had increased from 40 to 60 percent of the fund, and there had been large inflows over several years. Equity ownership stakes had grown even more significantly after a rebalancing of our asset allocation weighting at relatively low prices during the global financial crisis. With larger ownership stakes, trading became more expensive and ownership issues more important. We needed the investment strategy and our research focus to be aligned with the size and long-term character of the fund. The larger companies, and the long-term drivers of their prospects and fortunes, got our principal attention.

The introduction of research list benchmarks from 2011 implied that the portfolio managers would have formal coverage of all, or nearly all, companies in their benchmark. The number of companies covered by each portfolio manager was based on an assessment of how many companies could realistically be monitored by one person, and would typically be between 20 and 30. A larger number of companies would have had the advantage of a more diverse benchmark with less correlation between the shares, and would have enabled coverage of a larger proportion of the fund's holdings, but it would dilute the quality and focus of the research.

Research format

In the years after 2010, we gradually introduced standardised research formats across the teams to ensure a sufficiently long-term approach to research and decision making.

The portfolio manager who covered a company would be required to develop and maintain a financial model of the company. Companies under coverage had to be met at least once a year. The portfolio manager also served as the fund's point of contact with the covered company. For positions of a certain significance, there was a requirement to write an investment case. All required research was stored in a common repository. This ensured that the research was available across the organisation and made it possible to go back in time and see what was discussed with companies and how the risks to an investment case were perceived.

As the time horizon expands, a company's earnings and cash flow become increasingly important for its share price. Using a financial company model ensured that relevant information was aggregated, providing a basis for forecasting earnings and cash flow, and for valuing the company. Over time, we developed our own proprietary discounted cash flow template. This ensured a sound methodology that highlighted possible valuation inconsistencies, such as growth in revenue far outpacing growth in capital over a long period. A common template also made it much easier to share and discuss the research and analytics with colleagues.

Although we imposed the common requirements described above, portfolio managers still enjoyed a large degree of freedom in how they conducted their research. We thought autonomy was a valuable part of the research framework, and that independent portfolio managers would gain by being able to set their own work priorities. If the common research requirements we imposed were too demanding, the required research work would crowd out other priorities and stifle innovation. Striking the right balance between common formats and requirements on the one hand, and giving portfolio managers as much autonomy as possible on the other, was a constant challenge.

Chart 31 Share of the Ministry of Finance benchmark covered by region. Percent.

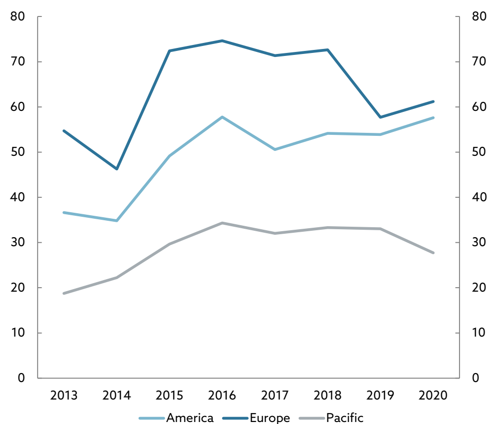
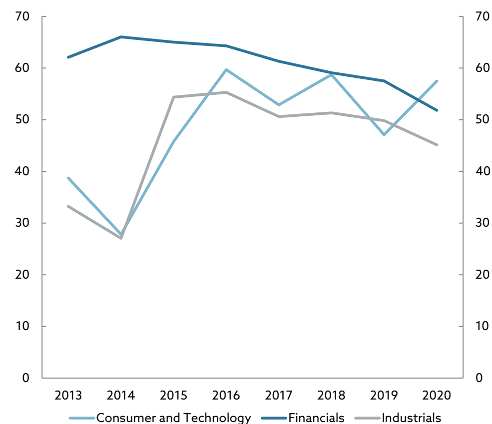


Chart 32 Share of the Ministry of Finance benchmark covered by broad industry grouping. Percent.



The company meetings – access and relationship

As one of the world's largest owners of equities, we enjoy unparalleled access to company management. We now hold more than 3,000 company meetings every year. This is one of our most important ways of creating an in-depth understanding of companies. The companies naturally have unparalleled insight into their own business, the products they make, their competitors, their customers and suppliers, and the markets in which they operate.

Company access – the interface with the fund

In the early years, when our assets under management were comparatively small and the fund's profile internationally was not yet established, it was more difficult for us to access company management. We therefore paid third parties in the form of investment banks to provide this service for us. The meetings would typically take place as part of management roadshows in connection with company results, or industry conferences set up by the investment banks. The portfolio managers organised meetings with the help of the investment banks, and co-ordination and tracking of meetings could be cumbersome.

In 2013, we created an internal corporate access team to help facilitate our meetings with companies and to strengthen the fund's profile as an investor in geographies where we thought that was needed. We were a first mover in the investment industry in setting up an internal corporate access team as an alternative to relying mainly on the corporate access teams of the investment banks. Since then, we have organised an increased proportion of meetings ourselves. By avoiding intermediaries, we have formed closer relationships with the companies we invest in, improved the co-ordination of meetings across our teams and geographies, lowered our reliance on third parties, and significantly reduced costs.

Chart 33 Number of companies met in one-on-one meetings by region.

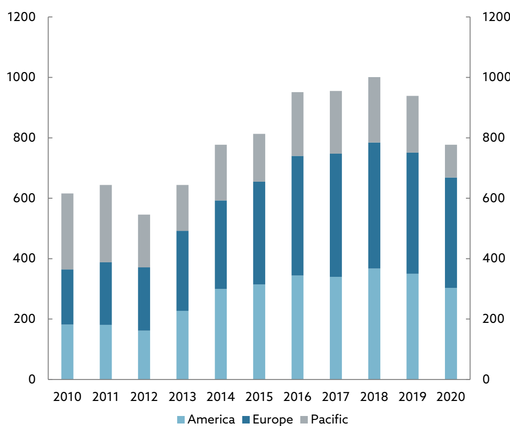
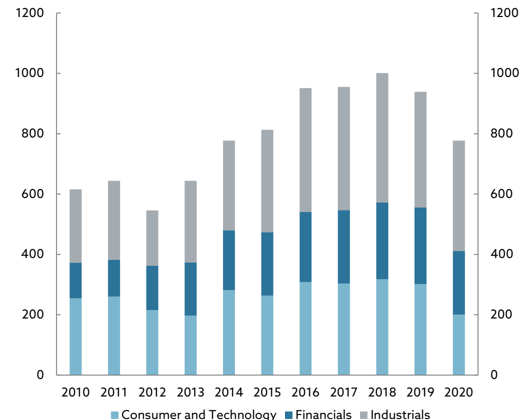


Chart 34 Number of companies met in one-on-one meetings by broad industry grouping.



Over time, as our size and reputation grew, companies became increasingly interested in having meetings with us. This enabled us to become more selective in our interaction, thus linking it more closely to our research and ownership objectives. Meetings at our offices in connection with roadshows and meetings at conferences would still be an important part of our interaction, but we supplemented this with meeting companies on our own initiative, and often on the company's premises. This allowed us to meet a more targeted and wider selection of manage-ment outside the company's normal investor roadshow schedule. Given that management's time is valuable, large companies would not normally grant this kind of access to smaller investors. This has allowed us to explore company issues in more depth and earlier than would be possible at roadshow and conference meetings.

Company meetings – representing the fund

From the start, it was important to us to meet companies in a professional way, and there was a strong expectation that we should be well prepared ahead of any company meeting. The individual portfolio manager would be the face of the fund for the company, and we wanted to be a serious, available and valued discussion partner. We would underscore our long-term orientation and mutual interest in profitable capital allocation. Management's views about the challenges faced by the company, and their thoughts on future execution, would get our attention and support.

There was initially no formal common format for our meeting notes. This changed in 2009 when the writing of summary meeting notes in a set format became compulsory. These were stored in a common repository, making them accessible

Chart 35 Number of one-on-one company meetings. By company representative.

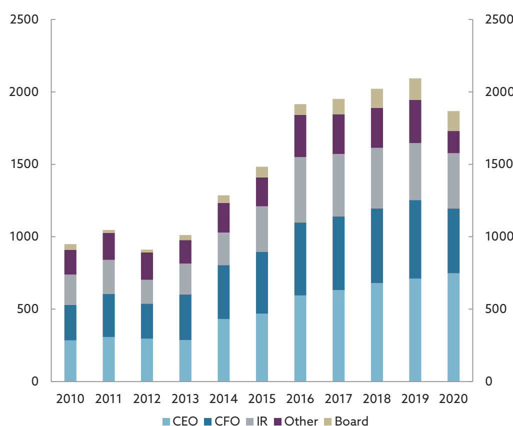
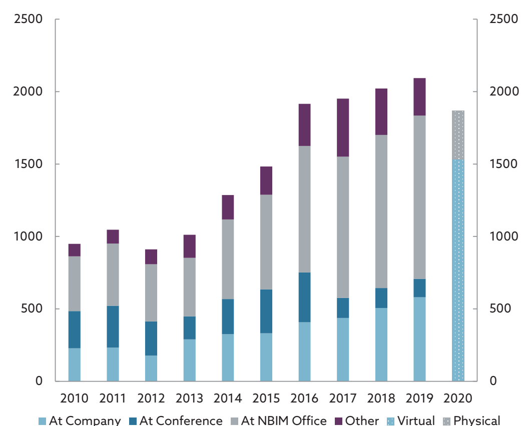


Chart 36 Number of one-on-one company meetings. By location.



to others and available for future reference. If a portfolio manager left, it would be easier to continue the company relationship from where it was left, and the information gathered in past company meetings would be available. The formal meeting notes increased the accountability of the company interaction.

In recent years, we have expanded our training of portfolio managers in how to run meetings and how best to broach critical issues with company management. The ambition is always to make the most of our high-level access to corporate management teams, and to conduct the meetings in a way that builds a positive and constructive relationship with the companies we have invested in.

Company interaction is an area where our approach has changed considerably over time. This reflects our larger ownership stakes, the increased emphasis on the fund's ownership role in companies, and our attempts to make the most of the opportunities this presents. We believe that, over time, our very strong access to companies relative to many other investors will build deep knowledge about the companies and their management teams. Used well, we believe this company and industry insight will contribute to investment outperformance.

We invest in companies with an extended time horizon. Meeting them as an engaged owner is our first priority.

Chart 37 Share of one-on-one company meetings set up by Norges Bank Investment Management. Percent.

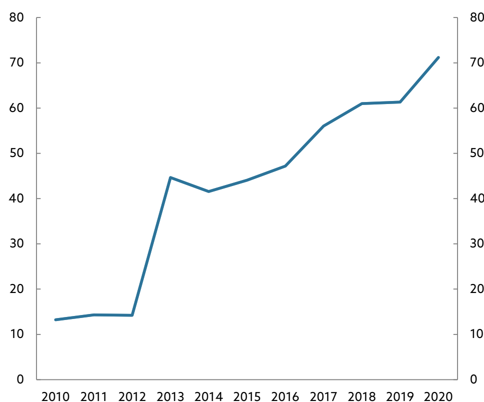
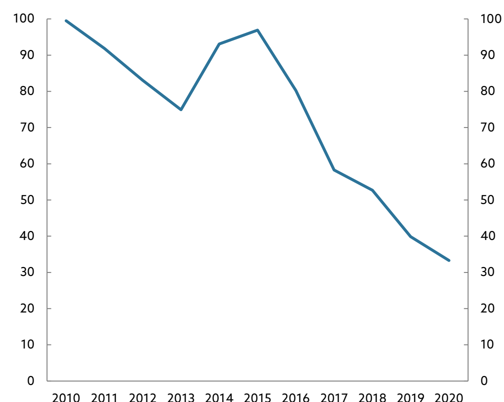


Chart 38 Broker research costs. Indexed to 100 in 2010.



The structure

The sector strategy has been developed as a series of individual mandates that should create consistent excess return with moderate risk as a combined total portfolio. Several choices were made when we constructed the overall portfolio of mandates. We needed to decide what parts of the investment universe to focus on, how to structure the individual mandates, and how to design and combine the mandates. The characteristics of the fund, including its size and global exposure, were important for how we would set up the mandates.

The investment universe

The sector mandates were carved out of the fund's broad index portfolio, and this gave full flexibility in how to define our sector strategy universe. When more assets were invested in a sector mandate in a specific sector or geography, fewer assets were invested in the same sector or geography in the indexing strategies. This was the key aspect of the funding of these mandates. It was not necessary to invest only in sectors that were marketable to clients, or had a higher expected return, given that the fund was broadly invested in most listed companies in global financial markets.

The sector strategy invested globally, but with a focus on Europe. Most mandates were global, but we also had regional mandates in some sectors. We did not overstretch to emerging markets. We invested in all industries but were pragmatic about both how to define the sector and how broad the mandates should be in each. We mainly invested in larger companies due to our size, our ownership role and the need for risk assessment of the fund's largest investments.

Geographies

The global nature of the fund led us to set up global sector mandates. We believed that market segmentation of investors would allow us to exploit pricing differences across geographies. As global financial markets became increasingly integrated, regional pricing differentials would narrow but would not disappear. The companies themselves were also rapidly becoming more multinational in most sectors, and even when they were not, industry trends tended to travel around the globe.

In the first decade, we were keen on exploiting pricing differentials from unsynchronised global markets. We were also attuned to the spread of industry trends, such as the constant advances in mobile telecommunications, media advertising and retail distribution. Unsynchronised macro cycles and considerable foreign exchange movements were a constant challenge. The consequent attention to macroeconomic developments, and whether to hedge the currency risk or not, was a distraction.

In the last decade, we have been more concerned about our ownership role and corporate governance issues in general across markets. This has led to more attention being given to our investments in Europe where our ownership stakes are large, and cautious involvement in distinct governance challenges in emerging markets. Over the years, we have therefore in three respects modified our global starting point. We have defined the mandates as global or regional depending on industry characteristics, we have increased our Europe focus, and we have restricted the number of emerging markets we cover.

Industry dynamics did not converge over time in all industry sectors. Industries with defining regulatory aspects, such as banking, telecommunications and utilities, remained regional. This was often a question of whether we should have mandates that crossed all regions. The EU

regulatory domain had a resolute influence on some sectors. We awarded regional sector mandates when the industry characteristics allowed, or as a stepping-stone for younger portfolio managers.

Over the years, we have emphasised our European investments. The Ministry of Finance decided in 1997 that half of the fund's equity investments should be in Europe. This meant that our ownership stakes in European companies were substantially higher than in other parts of the world. The Ministry decided in 2012 to reduce the relative ownership weight in Europe to 2.5 times that in North America. It was still important for us to have strong knowledge about European companies to better fulfil our owner-ship role. In addition, our external manager searches convinced us that the analytical resources and depth of research of asset managers in the US were superior to what we saw in Europe. We therefore thought we had a better chance of creating excess return in the European market. This was supported by our performance over the years in Europe.

In the first decade, a limited number of emerging markets were included in the fund's investment universe, and the sector mandates followed suit. With the extension of the fund's strategic benchmark to all emerging markets from 2008, we awarded a series of mandates to external managers in these 19 new countries. In the sector strategy, we would only include areas of the investment universe where we believed we could create outperformance. Local managers tend to have an edge in these markets given the influence of local regulation and markets. We also sought to avoid overstretching, given our emphasis on fundamental research, on-the-ground presence and meetings with company management.

The number of larger companies in the smaller emerging markets was also limited. In a short period from 2010, we had three emerging-market mandates that covered the 50 largest companies in the bank, telecommunications and resources sectors. The idea was to avoid a situation where external managers held the larger companies just because they were included in the benchmark. The large oil companies in Brazil, Russia, China and a few others were our main concern. In recent years, we have only had an emerging-market sector mandate for banks.

Sectors

We decided initially to concentrate on a limited number of sectors. By the end of 2001, we covered banks, insurance, retail, media and telecommunications. In 2002, we added oil and utilities. The funding of the sector mandates was based on an assessment of the potential to outperform on a relative basis within an industry, rather than a belief about how the industry would perform relative to others. The mandates were not products to be sold to clients. There was no need for each mandate to be diversified, as the diversification objective would be met at the fund level, allowing narrow sector mandates where optimal.

First choosing the industries that others in the asset management industry deemed less attractive for active management, such as finance, telecommunications and utilities, and later oil and basic industries, may seem unusual. These industries were seen as less interesting by many aspiring fund managers. The sectors were exposed to regulation, with challenged business models, rather than amenable to new technologies or products. The seemingly more exciting sectors, like technology and health care, we shied away from. We went to the areas where the competition from other investment

managers was thought to be muted, where American companies would not dominate a global market, and where there were still large structural changes in the form of challenges to old business models.

The number of industries that we covered increased over time. We added industrials in 2007, with the inclusion of basic industries and capital goods. By that time, we covered most business models that were not dependent on innovative technologies or new products. By 2015, we covered all industries and all the fund's largest company investments. In the first decade, we had chosen not to cover technology or health care, but we added these two large sectors as our ownership stakes in European pharmaceutical companies and the largest American technology companies grew.

Size

We only cover around 600 companies in the sector strategy, while the fund's policy benchmark and our index strategy cover more than 8,000. At the same time, these companies account for more than half of the value of our equity investments. In other words, our sector strategy investments are for the most part in large companies. These companies make up a much greater share of the fund's overall investments than smaller companies.

The reason for this focus on larger companies is that the sector strategy assumes an important role for the overall management of the fund besides the value created through excess relative return. Company insight is a necessary background for understanding the long-term risk parameters of the fund's equity investments. In addition, the sector strategy plays an important part in fulfilling our ownership role. The views we express on long-term strategy and corporate governance issues would not have the same resonance if we did not know the companies in depth. The largest companies will have dispersed ownership. In these companies, we will often be one of the ten largest holders of the company's equity, with the responsibility this position entails.

Another reason for concentrating on the larger companies is that large companies tend to be more multinational than smaller companies and are therefore well suited to being analysed from outside the country where they are based. Local managers, on the other hand, tend to have an advantage when analysing smaller companies with a more domestic business model, and a more local footprint in terms of customers and production.

Investments in large companies are also more readily scalable. The market impact may be considerable if we try to build an adequate position in a small company. With average ownership in Europe of 2.5 percent of freely traded shares, we could easily impact the pricing in the market if we just doubled our position. We needed the liquidity to give us the possibility of changing our investment view, as the trading cost through market impact and visibility in markets could be substantial. The research list would define the investment universe, and the size of any company included there should be large enough for an underweight to be substantial. Value creation comes from the excess dollar return, not the excess percentage return. To get an adequate position size to make a difference, companies should be large.

The investment structures

The way we have funded the mandates and set up benchmarks has evolved substantially over the two decades of the strategy. We have seen advantages and disadvantages to the three different approaches we have used.

The sector benchmarks

In the first five years, we used a traditional fund account setup, with each portfolio manager receiving a separate security account at our custodian that was funded with cash from attached bank accounts. The accounts were given benchmarks that were slices of the equity benchmark of the fund.

The fund's strategic benchmark was delivered by the index provider FTSE. We would follow the index provider's sector definition, company classification and share count. The companies included in the portfolio manager's benchmark thus followed from the FTSE sector definition, and the weight of the different companies in the benchmark would follow from the index provider's share count. In the first two years, the weighting corresponded to the full market capitalisation, as all shares were included. After a change in index methodology from 2001, the share count was adjusted by the index provider's definition of free float – the shares that the index provider considered to be freely traded rather than held by strategic owners.

The index provider thus defined both which companies should be included and at which weight. This was a standard way to define benchmarks for what at the time were referred to as "sector sleeves". The benchmarks would include many companies from each sector and typically consisted of between 50 and 100 companies. This was too many for a portfolio manager to have in-depth knowledge about, and the smaller companies were a distraction. Portfolio managers would normally not want to take an active position in a company if they had not formed an investment view. Investments were held simply because they were included in the benchmark, rather than as an expression of an investment view based on deep fundamental research. By investing in line with the benchmark in a company, they avoided taking a view on that company.

The sector benchmarks determined how we funded the mandates, as we sold the corresponding shares held in our index accounts. The benchmarks were thus not only a way to measure the portfolio manager's performance, but also the actual funding of the mandate. They represented the return the fund had given up in order to finance the portfolio manager's investments. The funding of the mandates was carved-out from the index, with the shares as listed in the index provider's classification of the sector. This entailed operational complexities, as the benchmark would vary over time with new companies, new share counts and corporate actions. At times, our portfolio managers overlooked the details of indexing and ended up missing corporate actions or index adjustments.

The setup with customised benchmarks based on widely used broad public benchmarks is a common way to construct mandates. However, the structure of the accounts with an externally defined benchmark, and corresponding actual funding, had some weaknesses. First, the index methodology meant that both inclusion and weight were decided by an external provider. The sector classification and company inclusion were not tailored to our managers' expertise or the way we looked at the market. Second, we tended to consider too many companies that were too small to make a difference. And third, we created operational complexities with frequent funding and rebalancing. We wanted to define ourselves a shortlist of investments that mattered, within a simple structure. The long-short structure would give us this.

The long-short

In the traditional fund structure, a portfolio manager will be given a certain amount of capital to buy stocks to hold. In the long-short structure, the portfolio manager will in the same way hold stocks that are referred to as "longs". However, the manager will also hold "short" positions in stocks that are expected to do less well. A short is generated by borrowing a share, with the promise of delivering it back later, and then selling the share in the market. If the share price falls, the share can be bought back in the market at a lower price and delivered back at a profit.

We set up the first two long-short portfolios in May 2005. This required extensive operational development of accounts, instruments, risk management systems, and custodian and back office provisions. The long-short structure we launched for the sector mandates was what is known in the industry as "dollar-neutral". The portfolio manager is not given any outright capital. Instead, capital to buy stocks is raised by the portfolio manager, by selling stocks that have been borrowed. The value of the long and the short side will be roughly equal, hence the term dollar-neutral. The overall active risk would be constrained by setting limits on the size and configuration of the long and the short side. The structure is sometimes also referred to as "market-neutral". This is in one way a misnomer, as the long and the short usually will have different sensitivity to movements in the overall equity market.

In a long-short portfolio, only stocks the portfolio manager had a view on would be entered. The long-short account also gave the portfolio managers flexibility in sizing positions in stocks they had a negative view on. In a traditional account, the size of an underweight would be restricted to the inclusion and size of a benchmark name. There was no such restriction in the long-short set-up. The anchoring to the intended sector and constraints on the scaling of positions would follow from restrictions in the investment mandates. The long-short mandates would hold the fund's relative active positions, while the broader market and sector exposures were held by the indexing mandates. This was at the time called an "alpha and beta division".

A long-short investment structure would normally depend on the financing of the short positions, as the shares required a secure borrow in the market. In our mandates, the bulk of the shorts were borrowed internally from the index accounts, although complemented with borrows from the market mostly in the form of contracts-for-difference (CFDs). The structure lent itself well to relative price moves between companies, often in the form of explicit pair trades, as the sector mandates tended towards. This kept some portfolio managers glued to daily relative market price moves, while we preferred attention to be paid to longer-term company developments based on fundamental research. This followed from and aligned with our role as a long-term owner of large stakes in individual companies. We also noticed a growth tilt in our overall investments, as it seemed easier to short business models with a stable cash flow.

The financial crisis in 2008 tested the long-short structure in extreme and volatile markets. Our short positions had some resemblance with aggregate hedge-fund positioning, and we saw moves in relative return correlate with these funds. This exposed us to variations in risk tolerance both for these funds and the available overall risk capacity in the market. A short-term trading orientation, a focus on market conditions rather than company prospects, and some crowded shorts sometimes ensued. The pair

trades also tended to be rebalanced by increasing long positions that lost value rather than reducing the short positions, to some extent based on a belief in mean reversion.

The long-short structure had several advantages. First, it gave us a selective view regarding the companies to be concerned with, and flexibility in scaling positions. Second, we had a clear focus on companies and investment risks that we had analysed and developed a view on. And third, the ease of construction, and the simple model without benchmark or funding issues, were a clear positive.

On the other hand, the research coverage was at times not optimal from a fund perspective. The growing ownership role meant that we could not afford to disregard some of our larger holdings, and overlooked companies became an issue. Second, borrowing securities in the market was somewhat different from our usual ownership role. And third, short-term price sensitivity would give us a valuable market focus, but could at times be a diversion.

The research lists

The sector benchmarks and the long-short structure both had advantages and disadvantages. The question was whether we could create a structure to keep the best of both approaches: a limited number of companies tailored to the portfolio managers' knowledge base, a focus on companies we decided to research to avoid broad screening of the investment universe, flexibility in design with gradual changes as we saw fit, and no dependence on external index providers to decide company inclusion, or on the market for borrowing shares.

We also sought to avoid the weaknesses. The sector benchmarks were coerced both in names included and their weighting, while the long-short structure was too open. The sector benchmarks included too many shares for deep fundamental research, while the long-short positions were few in number relative to our need for extensive research to back our ownership attention to the fund's most significant investments. The sector benchmarks entailed detailed index management and rebalancing, while the long-short approach entailed some complexities of short instruments and borrows in the market.

After five years with traditional long-only accounts, and another five years with long-short accounts, we moved to a structure which we thought would encapsulate the best of both worlds. At the end of 2009, we issued a new set of long-only accounts in addition to the existing long-short accounts. In 2010, our portfolio managers managed both types of accounts, before we consolidated to one account with a narrow and tailored benchmark at year-end. The new benchmarks were named "research lists" to underline that the starting point was a list of the companies that we wanted each portfolio manager to cover with fundamental research and financial models.

The research list served to anchor the portfolio manager's research effort, with a well-defined list of companies that they could realistically have an in-depth knowledge of. The constituents were not determined by the sector classification of the index provider. Instead, we selected the companies in each research list according to how research could be most effectively conducted and utilised. This was determined by sector characteristics and the experience and expertise of the portfolio manager. The benchmarks would consist of fewer than 30 companies to allow deep research on all companies included. We would tailor the

universe of each portfolio manager to their knowledge base and to the research we sought, without being dependent on outside factors like index providers or current market interest. In addition, we could construct full value chains of related companies and industries and distribute research coverage and responsibilities in close-knit teams.

The companies were not weighted as a function of company size, by full market capitalisation or adjusted by strategic holding definitions. Instead, a weighting scheme was developed that gave each company closer to an equal weight. The research list was also the actual funding of the account, a carve-out from the index of a defined number of shares for each company. This meant that, unlike a more conventional benchmark, the whole funding side would represent the actual ongoing research focus of the portfolio manager. The list was also a predefined opportunity set for underweights corresponding to short positions. The underweights would, however, be limited to the shares we had in the index portfolios, as we did not pursue external borrowing of shares. We could just as well have called the tailored benchmarks "shortlists".

The opportunity to change the list of coverage and adjust the relative weight of the different companies gave management an important tool. The research list was a way to direct research efforts and to manage the risk profile of the combined portfolio. Sector, country and currency exposure could be adjusted after consultation with portfolio managers. The overall research list ensured coverage of a reasonable number of companies, attention directed to where we saw potential for value creation, interest expressed by appropriate weighting, and a bird's-eye view of the full industry complex and value chain.

The research list approach was simple and robust in practice and would fit well with the long-term ownership approach that was encouraged. Operationally, the lists were easier to manage with less need for index maintenance and rebalancing. They would combine the long-short mandates' focus on a limited number of companies and flexibility of investment universe, with the long-only mandates' ownership orientation. They also facilitated the portfolio managers' contribution to company interaction and participation in the fund's voting process.

Overall, our experience with the research list benchmarks has been positive. The approach supported a differentiated investment approach that built specialist industry and company knowledge over time. The approach encouraged position taking across a narrow set of relative investment opportunities for each portfolio manager. This may have supported investment outperformance, but has also led to some missed opportunities relative to a less constrained approach, and at times less independence for the portfolio managers. The structure has remained unchanged to this day.

Chart 39 Comparison of constituent weights in a conventional sector benchmark and a research list. Percent.

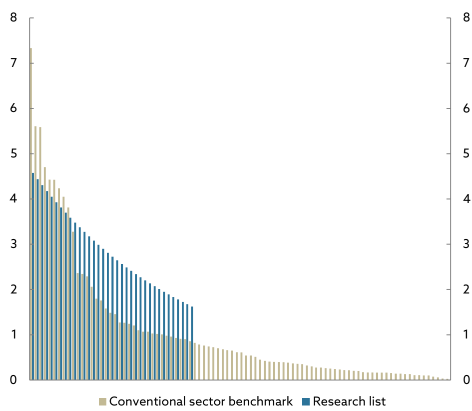


Chart 40 Active share decomposition. Percent.

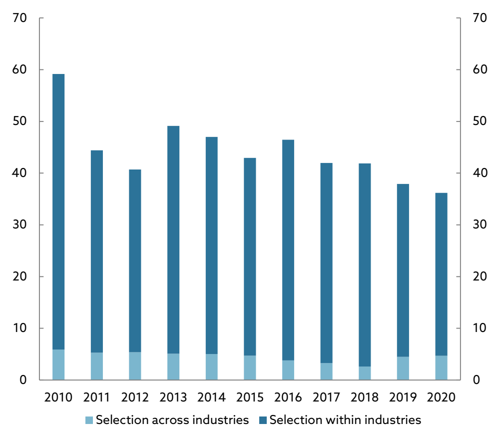


Chart 41 Benchmark weight by region. Percent.

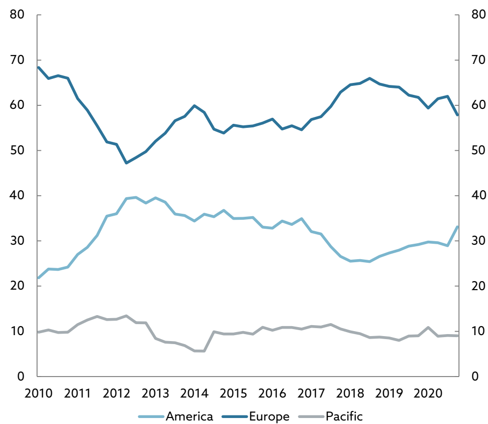
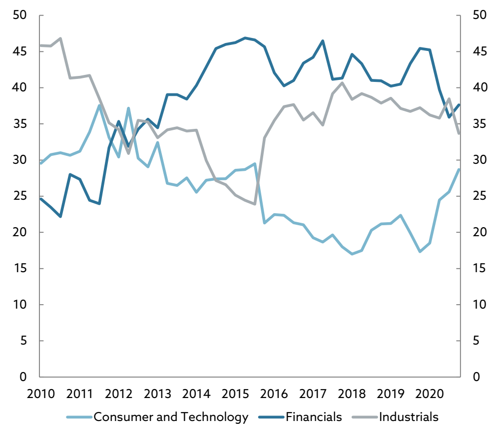


Chart 42 Benchmark weight by broad industry grouping. Percent.



The investment mandates

The investment strategy was built on the issuance of a series of investment mandates to individual portfolio managers. We would decide on the number of mandates, and then decide how to design these, what assets to allocate to them, and how to combine them. In practice, the number and size of mandates would also instruct organisational aspects such as the number and size of the investment teams.

The fundamental law of active management was a guiding investment principle at the time the sector strategy was set up. Its elements informed the early deliberations around mandate design, mandate allocation through funding, and mandate combination for the overall strategy. How to specify, scale and assemble the investment mandates of the individual portfolio managers has since been an important part of the investment strategy.

Design of mandates

The investment mandates we issued to the individual portfolio managers followed a set format. Each would specify what it should achieve, where the manager could invest and in which investment instruments, and how the results would be measured. The mandate also defined what would be an acceptable investment profile.

The investment mandates thus had four parts: a formulation of the investment objective, a definition of the investment universe and the instruments the portfolio manager could use, a benchmark for funding and performance measurement, and a series of investment restrictions to guide and contain the investment risk.

The objective would typically be stated in a quite general formulation, such as "outperformance in a consistent and controlled manner". In the last decade, we have also included a formulation on governance issues, such as "consideration shall be given to economic, financial, environmental, social and corporate governance risk factors". The actual performance target would typically not be stated in the mandate but would be specified in a separate incentive structure.

The investment universe would specify the geography and sector as discussed above, but permit investment elsewhere to give adequate flexibility for investment ideas, although typically limited to 10 percent of the investments. The instrument definition would in general only include common equity, as we thought other investment structures could be a distraction. The benchmarks reflected the chosen investment structure and had different forms over the years, as discussed above.

The restrictions would typically include a limit on ownership stakes and a maximum absolute size or share of the portfolio for the largest positions. The limits on ownership were originally set at 3 percent of outstanding shares. As the fund grew larger, and the liquidity concerns and the market impact of trading increased, we would instead limit the single positions relative to freely traded shares. They were typically set at 5 percent of free float as defined by the index provider FTSE. The restrictions would also include limits on cash holdings and foreign exchange exposure. We wanted all portfolios to be fully invested, and cash limits were set low. Country exposure was left to the managers, while the foreign exchange exposure could be hedged if they saw fit. The number of investments in the portfolio was not constrained, and there were no limits on trading or turnover.

An important aspect of the mandate design was that exemptions could be given when

appropriate. This would entail an overall judgement of the investment risk both in the individual position and for the combined strategy. In practice, ownership limits exemptions could be given after considering holding data on names of shareholders and whether more than one portfolio manager would hold the same stock. Cash levels and currency exposure were generally considered at the combined strategy level. The more elaborate risk considerations, such as risk layers and systematic risk factors, were left to discussions within the team and supported by risk analytics presented to the portfolio managers.

The mandate objective, universe, benchmark and restrictions were all important in the strategy design and mostly remained stable over the years. We wanted the mandates to be fully invested with simple instruments, with limited and diverse ownership stakes, and with few risks that were not thoroughly analysed. We did not intend to take a view on elements such as market direction, foreign exchange, systematic factor tilts or trending themes.

Allocation to mandates

In the first decade, the allocation of capital to the different portfolio managers was not that different. The largest mandates would have around three times the capital of the smallest mandates. This increased to five times by the end of 2015, and ten times by the end of 2020. This reflected the larger differences in the experience of the managers, but also greater differentiation between managers as we now had a longer track record of their performance.

The variation in the mandate sizes was thus mainly driven by assessments of expected outperformance at the mandate level. This did not only reflect past performance. We placed great emphasis on understanding each portfolio manager's investment approach. We did this through ongoing analysis of performance and risk profiles of the portfolios, together with formal review meetings and informal interaction at work.

The funded capital of each portfolio manager also had to take into account the investment capacity in the actual market segment. A mandate within a small industry with many companies would rarely get the scale of the larger, more concentrated corporate sectors. This was in practice reflected in how the research lists were constructed, as the benchmark scalability in different parts of the investment universe varied widely.

The third factor was how the mandate would fit into the combined portfolio of mandates. The sector strategy's investment risk should be balanced as a whole, the relevant risk measures being the ones that looked at the combination of all mandates. The funding of the individual mandates would therefore consider incremental value at risk and extend this to a series of risk measures.

Combination of mandates

The foundation for the investment strategy in the fund has been the fundamental law of active management. With this starting point, one would want to have as many independent investment positions as possible given the same level of skill or probability of outperformance. The consequence for us was not to have as many investment positions as possible in every mandate, but rather to have a large number of independent mandates that each had relatively concentrated positions in fewer companies. The reason for this was simply that we thought skill and probability of outperformance would be higher when the knowledge base was built on fewer companies that were understood in depth.

We therefore designed the sector strategy to have a larger number of concentrated mandates, instead of a limited number of broad generalist mandates. We wanted the individual mandates to be specialised and narrow to ensure we had adequate insight and skill. Furthermore, we aimed for the overall strategy to have as many positions as possible to have the breadth of numerous investment ideas. Finally, we recruited different personalities, designed clear role divisions in the organisation, and encouraged an investment process with independence in the decision making. We expected that the investment positions would then be more independent.

These were the three elements of the fundamental law of active management: skill, breadth and independence. We would research in depth to achieve a high level of skill, increase the range of the decision making through many separate mandates, and ensure independence in the day-to-day work. This should, according to the theory, result in a higher excess return for every unit of relative risk taken. In other words, a higher information ratio for the overall investment strategy.

The individual mandates did not need to be balanced in style, nor did we need to hedge risk at the individual mandate level. This, we surmised would further increase the degree of freedom and thus investment conviction of the individual portfolio managers. With the common research expectations and firmer team structure introduced in 2011 and 2012 respectively, this independence was probably somewhat reduced. Over time, we also moved towards more unequal funding and thus less diversification. On the other hand, we achieved a more coherent industry portfolio and fewer positions that cancelled each other out.

The many portfolio managers increased the investment capacity and nimbleness of the overall sector mandates portfolio. This aspect became increasingly relevant as the fund grew much larger. The structure was dependent on many talented portfolio managers to work as a combined and durable strategy.

Chart 43 Net asset value by mandate at the end of 2020. Billion kroner.

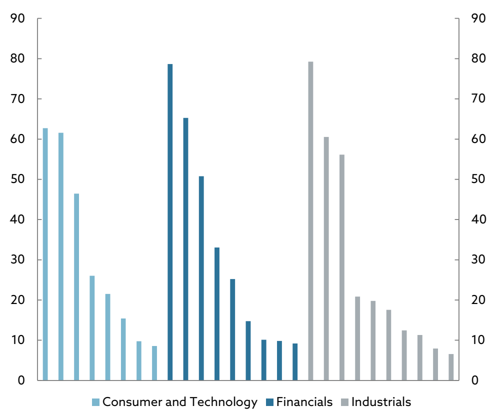


Chart 44 Value of overweights by mandate at the end of 2020. Billion kroner.

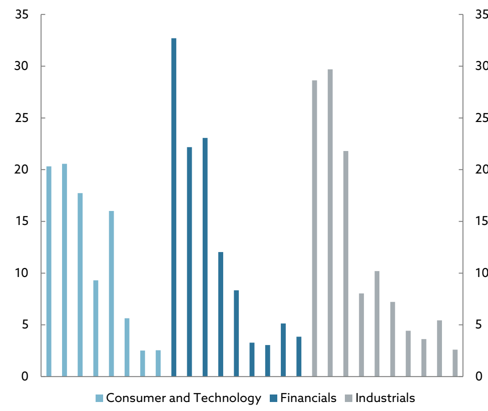


Chart 45 Number of portfolio holdings by mandate at the end of 2020.

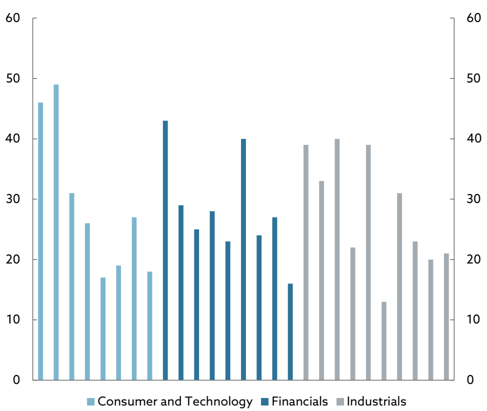
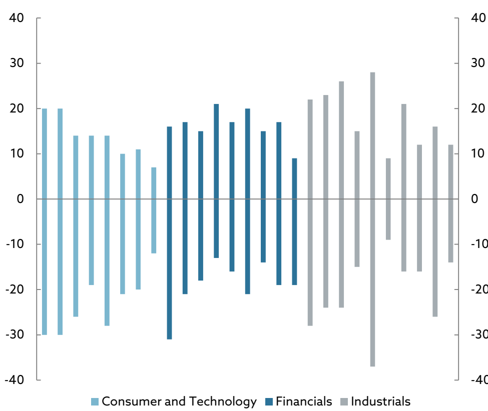
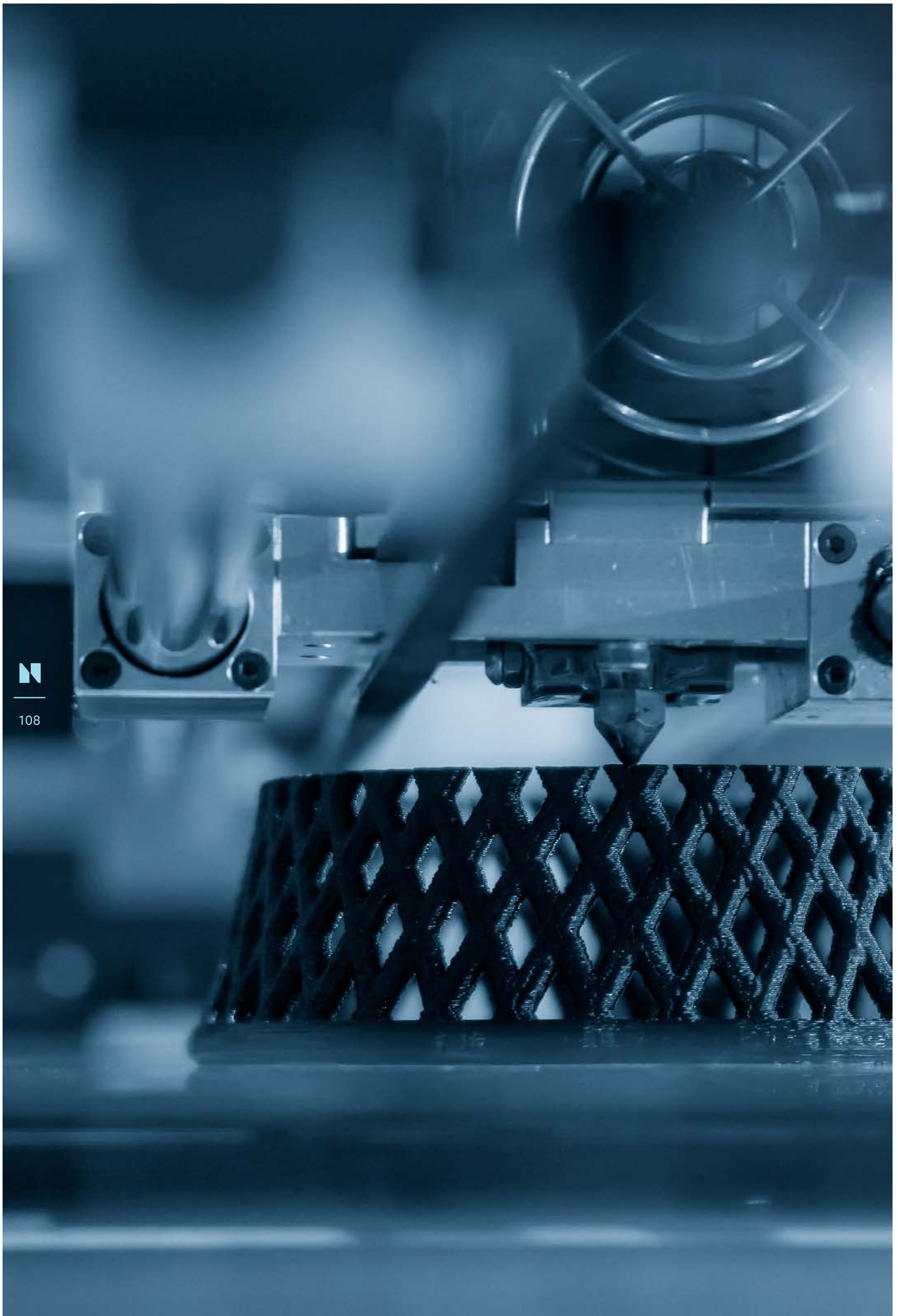


Chart 46 Number of overweights (positive numbers) and underweights (negative numbers) by mandate at the end of 2020.





The return

The investment returns from our sector strategies have been consistent and positive for the last two decades. We have kept the main elements of the strategy steady through extraordinary market turmoil and economic crises.

From the beginning of 2000 to the end of 2020, our sector mandates achieved an absolute return of 4.3 percent on average per year. In comparison, the benchmark of the sector mandates returned an annualised 3.4 percent in this period. The sector mandates have thus produced a relative return of 0.9 percent on average per year since inception. All return figures include converted returns for the long-short period between June 2005 and December 2009.

Cumulatively, the absolute return was 142 percent, while the benchmark return was 101 percent. The cumulative outperformance was thus 41 percent on an arithmetic basis and 20 percent on a geometric basis. The monetary value of the cumulative outperformance is 41 billion kroner, before costs and without taking any effects from reinvesting into account.

Measured over the entire period since inception, the average annual tracking error is 2.1 percent, while the information ratio is 0.5.

The returns over time

Relative returns were strong in the first two sub-periods. The annualised relative return was 1.2 percent between 2000 and 2005, and 1.3 percent between 2006 and 2010. In the first period, average annual tracking error was 1.6 percent. In the second period, average annual tracking error was 3.3 percent, driven by increased volatility during the financial crisis. The corresponding information ratios were 0.9 and 0.5.

Relative returns in the last ten years have been lower than in the first eleven years, but have been achieved on a much higher asset base. In the 2011-2015 period, the annualised relative return was 0.2 percent. In the most recent period from 2016 to 2020, the annualised relative return was 0.8 percent. In the first period, average annual tracking error was 1.7 percent. In the most recent period, it was 1.5 percent. The corresponding information ratios were 0.1 and 0.6.

Over the full period, the sector mandates had an asset-weighted annualised relative return of 0.7 percent. This is comparable to the 0.9 percent relative return on a time-weighted basis. As the amount of assets managed by the sector mandates has increased tremendously over time, the asset-weighted return places little emphasis on returns in the first years and much greater emphasis on returns in more recent years. The slightly lower return on an asset-weighted basis is caused by a very high relative return in 2000, when assets were very low compared to later years.

The asset-weighted relative returns for each of the four sub-periods were 1.0 percent, 1.0 percent, 0.2 percent and 1.0 percent, respectively. The weights assigned to each of these periods in the asset-weighted calculation for the full period are 6 percent, 13 percent, 33 percent, and 48 percent.

The sector mandates as a whole outperformed their combined benchmark in 61 percent of months between January 2000 and June 2020. In up-markets, they outperformed in 74 percent of months, and in down-markets, 44 percent of months.

The returns and the markets

2000-2005: The tech bubble aftermath

Global equity markets struggled in the first years of the 2000-2005 sub-period. The tech bubble burst, there were the scandals at Enron and WorldCom, and terrorists attacked New York City. The newly established sector mandates manoeuvred these difficult markets successfully. Performance in 2000 was particularly strong. The following year, some of this performance was given back. Markets were especially poor in 2002, and the sector mandates fell almost 29 percent. However, this was practically the same as the fall in the corresponding benchmark.

Markets turned in 2003. Worries about war in the Middle East and the SARS epidemic in Asia subsided, while economic growth picked up. The rapidly growing Chinese economy led to rising commodity prices. The sector mandates did well in 2003, 2004 and 2005.

2006-2010: The financial crisis

The rally continued in the first years of the 2006-2010 sub-period, as the global economy in general and the Chinese economy in particular continued to improve. The sector mandates outperformed their combined benchmark in both 2006 and 2007, continuing the run of strong performance that had started in 2003. Returns were about 1 percent higher than the benchmark in each of the five years between 2003 and 2007, except for 2006 when the outperformance was more than 3 percent.

The sector mandates continued to outperform in the first eight months of 2008. However, the portfolio suffered large losses in the weeks after Lehman Brothers filed for bankruptcy on 15 September. Losses were particularly severe among our bank investments. Some of our largest long positions halved in value, while the short positions that had funded the long positions in many instances hardly moved and in some instances actually increased in value. Overall, the sector mandates lost more than half of the relative return that had been accumulated since inception.

Equity markets continued to fall over the next five months. Although performance had been exceptionally poor during the initial downturn in September, the sector mandates performed in line with the markets during this period. The markets then started to recover in March 2009, and the sector mandates would go on to outperform every month for the rest of the year.

Most of the monetary loss in 2008 was recovered during the strong rebound in 2009. Over the full two-year period, however, the monetary performance was negative. In contrast, the time-weighted relative return was positive. Over the two years, the annualised relative return on this basis was 0.5 percent. The discrepancy between the monetary performance and the time-weighted percentage performance is due to assets being much lower in 2009 than in 2008. On an asset-weighted basis, which takes into account the higher level of assets in 2008, the average annual relative return was -0.6 percent.

2011-2015: The euro crisis

Equity markets were heavily influenced by the European sovereign debt crisis in the first years of the 2011-2015 sub-period. The sector mandates had outperformed in 2010, but

underperformed in 2011, when equity markets fell significantly as concerns about European sovereign debt intensified. However, the largest losses in 2011 came from the investment in Tokyo Electric Power, whose value was drastically reduced due to the Fukushima nuclear disaster.

The sector mandates did well in both 2012 and 2013 but underperformed in 2014. A large, long-term position in the British insurance company Prudential plc did especially well, contributing very positively in all three years. Another impactful position was in the US mobile carrier Sprint Corp. In 2012 and 2013, this position was among the top contributors, helped significantly by a huge rally at the end of 2013 on hopes of a merger tie-up. In 2014, however, the hoped-for merger did not materialise, and the stock performed very poorly.

2016-2020: Recent years

The most recent sub-period 2016-2020 started with the sector mandates giving back some of the performance they had achieved in 2015. Over the two years of 2015 and 2016, the mandates that specialised in banks, insurance companies and basic industries did especially well. On the negative side, the overlay mandate underperformed significantly from 2014 to 2016, after strong performance in the preceding years. Since the start of the overlay mandate, the correlation between the overall performance of the sector mandates and the overlay mandate had been much weaker than expected. Partly as a result of this experience, the overlay mandate was reduced in size.

2017 was another good year, driven mostly by the same mandates that had done well in the previous two years. Performance in the first three quarters of 2018 was broadly flat. In the final quarter, there were large falls in global equity markets, associated with a lowering of global growth expectations. Most of the sector mandates underperformed during this period, leading to an underperformance for the strategy as a whole in 2018. There was a quick rebound in relative performance as markets recovered in the beginning of 2019, which led to 2019 also being a positive year in terms of performance.

The beginning of 2020 was dominated by the severe market falls associated with the Covid-19 pandemic. Most of the sector mandates underperformed when global equity markets fell between 10 and 15 percent in the fourth quarter of 2018. Unlike this experience, a majority of the sector mandates outperformed their respective benchmarks in the first quarter of 2020, when global equity markets fell more than 20 percent. On a combined basis, the sector mandates essentially performed in-line with the benchmark in this period.

By the end of March, markets had started to recover. The huge uncertainty that had driven markets down gave way for renewed optimism. Equity markets rallied for the rest of the year, increasing more than 70 percent from the 23 March trough.

The sector mandates did exceptionally well during this market rally, outperforming their benchmark in all but one of the last nine months of the year. For the full year, the sector mandates posted a relative return of 3.5 percent. Outperformance was broad-based, with 24 of the 31 mandates that were active for most of the year contributing positively to the overall result. Relative returns were especially strong in mandates that invested in the telecommunications and technology sectors.

The returns of the mandates

There have been around 70 different portfolio managers running sector mandates since the strategy's inception. About two-thirds of these portfolio managers have made a positive contribution to the overall result. Since January 2010, when long-short portfolios were disbanded, the average mandate has had an annualised relative return of 1.4 percent. This figure includes active and terminated mandates and mandates of varying duration.

Mandate duration

The average duration across all sector mandates is about 5.5 years. This figure is an underestimate of actual mandate duration, as it includes a substantial number of mandates that have been launched in recent years and are still active.

Mandates launched prior to 2013 have had more time to mature. These mandates have an average duration of about 7.5 years. This is a better estimate of the typical length of a sector mandate.

The average mandate's annualised relative return is substantially higher than the annualised relative return on the overall sector mandates since January 2010. This is partly because the highest relative returns have been achieved by mandates with relatively short durations. These mandates have contributed less to the overall result over long time periods.

Weighing mandates by their duration in the 2010-2020 period, the average mandate had an annualised relative return of 0.9 percent. Relative returns for mandates with durations shorter than a year are included in the calculation, but not annualised.

Capital allocation

As detailed in another part of this chapter, capital is not allocated evenly across mandates. Senior portfolio managers with especially strong investment processes are entrusted with significantly larger portfolios than others. In recent years, the top five mandates have managed about half of the combined portfolio.

The varying level of assets is another reason why the average mandate has a higher relative return than the overall portfolio. Everything else being equal, it is easier to achieve a high relative return in percentage terms with a low level of assets. When we add capital to a portfolio manager, we expect the relative return in percentage terms to decline. What is relevant to the fund, however, is the relative return in monetary terms, and this is what we expect will increase as a result of the capital allocation decision.

Our analysis suggests that the relative return on the sector mandates in percentage terms since January 2010 would have been somewhat higher if every mandate had been the same size. However, this assumes that the smaller portfolios could have scaled up their positions without any issues. It is likely, however, that the smaller portfolios have used their nimbleness to their advantage. At the very least, their trading costs would have been higher if they were larger. On the flip side, increased nimbleness would have improved the percentage returns on the larger mandates. However, it would not have helped their monetary returns.

In practice, we have not considered giving the most junior portfolio managers the same capital as more senior portfolio managers. A more realistic comparison is hence achieved by calculating actual returns and equal-weighted returns without the contribution from the most

junior group of portfolio managers. Under this assumption, the two return series show only limited differences.

Impact of industry performance

Our portfolio managers concentrate on identifying the best investment opportunities within their industry. As such, they do not spend much time analysing whether their industry will do better or worse than other industries or the market overall. However, we have seen a tendency for our portfolio managers to do somewhat better when their industry does indeed outperform the general market.

To study this, we have looked at year-by-year mandate performance since 2010. We analyse annual rather than monthly data to avoid short-term noise. Only mandates that have been active throughout a year are included.

Our data show that when a mandate's industry outperforms the general market, the average relative return is 2.0 percent. When a mandate's industry underperforms the general market, the average relative return is 0.8 percent. The difference is economically significant, but not significant in statistical terms.

The difference in returns may be linked to behaviour by market participants. When an industry is doing poorly in the market, there is likely to be less attention from other knowledgeable market participants, and they may reduce their industry exposure. When an industry becomes more popular and receives more attention from these participants, unjustified relative valuation differentials may be rectified, leading to outperformance by our mandates.

Table 6 Annualised performance

	2000-2005	2006-2010	2011-2015	2016-2020	Full period
Portfolio return	-0.9	3.0	7.9	8.4	4.3
Benchmark return	-2.1	1.6	7.8	7.6	3.4
Relative return	1.2	1.3	0.2	0.8	0.9
Tracking error	1.6	3.3	1.7	1.5	2.1
Information ratio	0.9	0.5	0.1	0.6	0.5

Assumptions made to convert returns during long/short period.

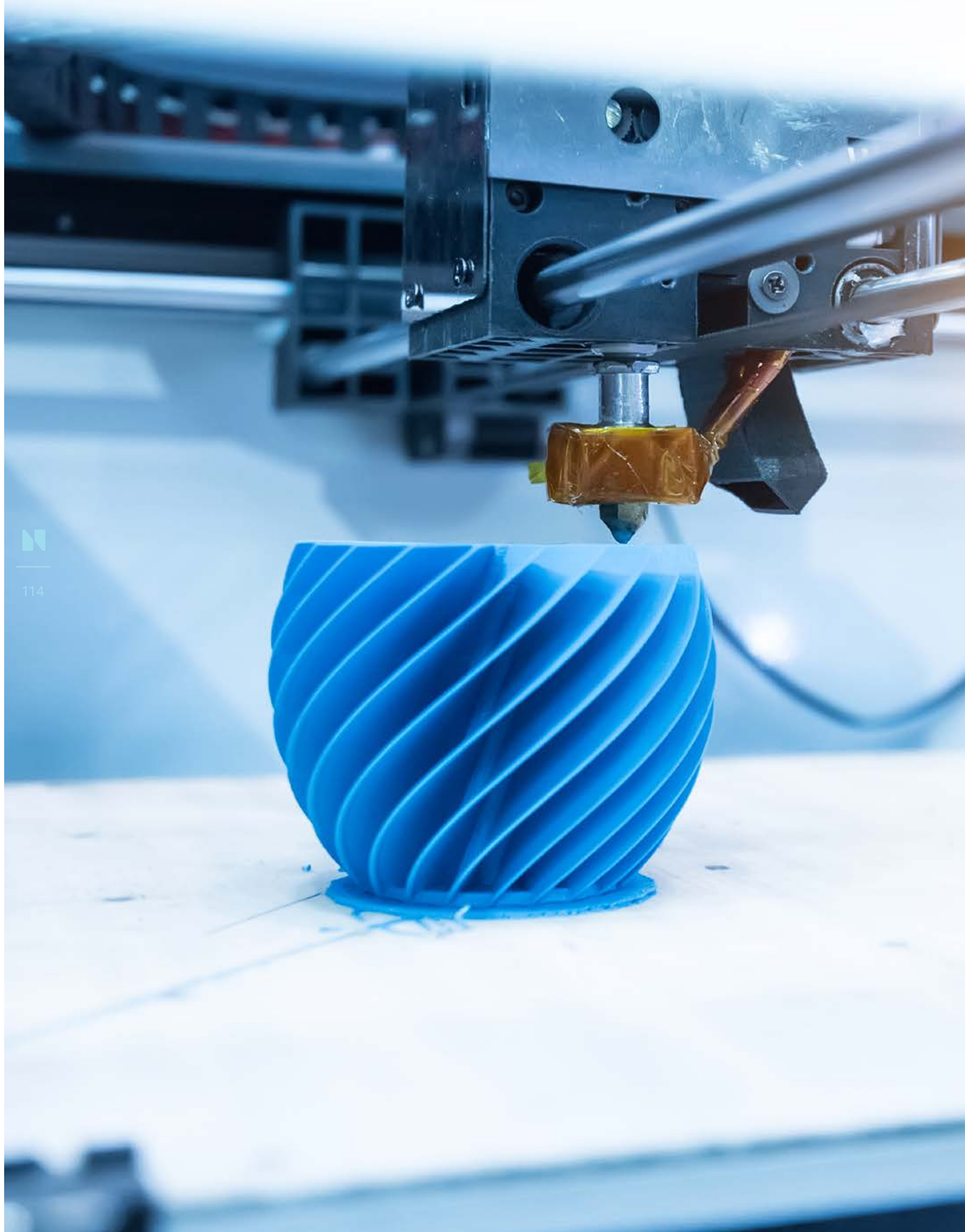


Chart 47 Cumulative relative return of the aggregate portfolio. Assumptions made to convert returns in long/short period. Geometric difference in percent.

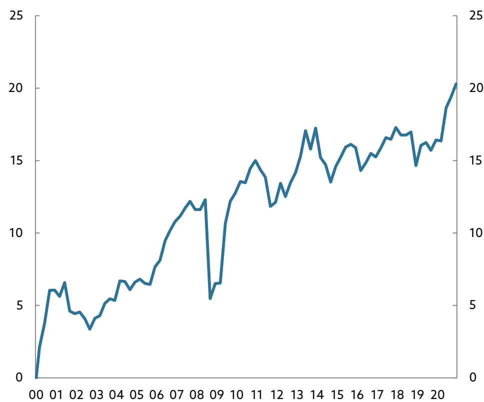


Chart 48 Cumulative relative return of the aggregate portfolio. Billion kroner.

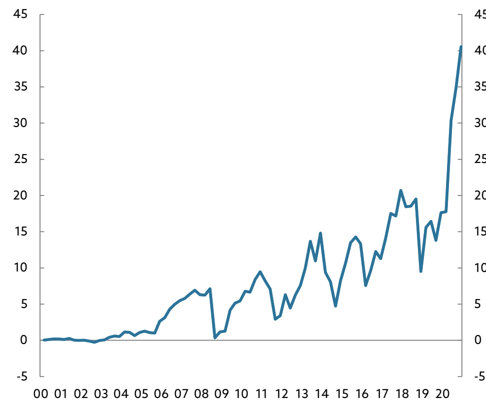


Chart 49 Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis) of the aggregate portfolio by distinct periods. Assumptions made to convert returns in long/short period.

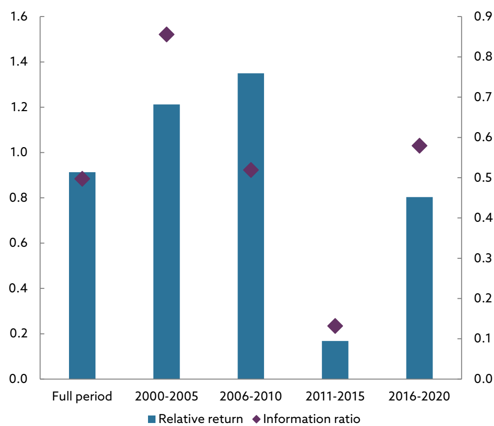
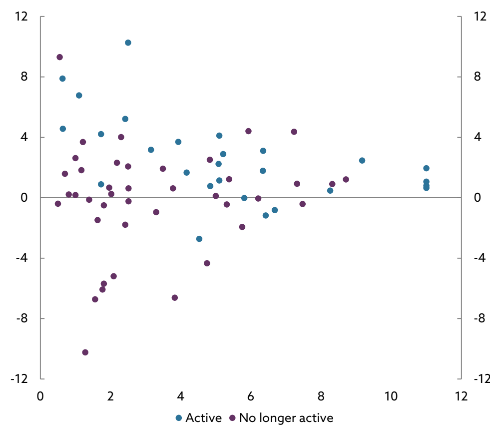


Chart 50 Performance and duration by mandate. Annualised relative return in percent (y-axis) and duration in years (x-axis). From 2010 to 2020.



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The specialist mandates

The equity part of the fund had grown very large following years of inflows, a shift to a higher equity share, and large purchases of equities during the global financial crisis. Starting from 2009, we funded new specialist mandates to complement our sector strategy. The additional strategies were our capital market mandates, environmental mandates, and China mandates. They all catered to a significant economic development, in the world's financial markets, in the world's energy market, and in the world economy's geographic balance.

The period after the crisis was one of change in how we invested in companies. The sector mandates strategy was realigned to encourage more long-term position taking, and to better enable us to fulfill the fund's more prominent ownership role. We also started up several new investment strategies.

The new capital mandates strategy was the one most closely linked to the greatly increased size of the equity fund. While the sector mandates focusing on specialisation along industry lines and decision-making autonomy produced good results, we believed that there were investment opportunities that were difficult to exploit within this strategy. The capital mandates strategy formally started up in December 2010. The intention was to take large long-term positions in single companies across sectors. Taking part in large capital market transactions was an integrated part of the strategy.

The environmental mandates strategy launched in December 2009 had a very different starting point. During the broad public evaluation of the fund's ethical guidelines in 2008, the Norwegian government indicated that it would assess positive selection as a tool for investments in environmental technology. In the national budget for 2010, Norges Bank was assigned the task of establishing separate environment-related mandates within the fund's existing investment universe.

The new China mandates strategy was not directly linked to the much larger size of the fund, but as the fund grew, and the Chinese economy grew and opened up, we could increase our active allocation to China and justify a team on the ground. A China team could also be of value to other parts of the organisation as China became a more important market for many large companies listed in developed markets. The size of the Chinese economy, the fact that most Chinese companies were mostly exposed to China, and the need for local language and cultural knowledge, meant a departure from the sector focus in favour of a geographically focused team. In January 2012, a new Mandarin-speaking investment team started to help manage the internal part of our equity allocation to China based on fundamental company insight. We expected that it would be possible to outperform by selecting good companies to invest in, but also by avoiding investing in companies that would eventually fail or significantly underperform.

The capital mandates

The capital strategy was linked to the increased size of equity assets in the fund. The mandates were established to invest across sectors, act on larger investment opportunities and be active in equity capital market transactions.

Towards the end of 2010, we started to consider a series of mandates to complement our sector strategy. Some companies did not fit into a sector definition, some larger investment opportunities passed us by, and our market share in equity capital market transactions was low. Investing across sectors, and acting on themes that affected multiple industries, were not in the foreground, as the mandates in the sector strategy mostly invested within a well-defined industry. The capital mandates were established to capture these opportunities and improve our market share in capital markets.

The history

Establishing the mandates 2010–2015

The investment strategy started in November 2010 with the acquisition of a 1.3 billion dollar investment in BlackRock in a capital market transaction. At the time, it was difficult to carry out this transaction within the delegated mandate structure due to the exposure limits of individual mandates. In addition, asset management was not then an industry that our financial sector teams in banking and insurance analysed. We set up two new accounts called "long-term holdings" and "special situations" to facilitate the capital mandates investments. The mandates acted on opportunities generated by large capital market transactions and ideas from our cross-sector research. In addition to the BlackRock investment, six of the fund's existing positions were transferred to the accounts. The total size of the capital mandates at the end of 2010 was 19 billion kroner.

We established industry and thematic research to identify long-term trends that could be relevant for investments across industries. A research team was established with a structure where several analysts would work on the same idea at the same time. We hired seven analysts and portfolio managers in the period from 1 May to 1 November 2011. Three were new external hires, and four were internal hires. In 2012 to 2014, we made six additional external hires.

The size of the investments, and the challenge of reversing large ownership stakes, required an extra layer of deliberation and to some extent also a long-term anchoring of the investments in the organisation. The investment process therefore introduced a structure where investment proposals were presented to three senior decision makers at an investment meeting. The investment team could bring any new investment ideas or changes to existing positions to the table and needed approval at the meeting.

Few institutions have the capital to be a significant investor in capital placements and changes to the capital structures of large companies. The fund can use its scale to its advantage and build a large stake at a discount to market prices, by providing the seller with certainty that it will be possible to complete the transaction. The new mandate allowed the fund to act on the opportunity to invest 1.3 billion dollars in BlackRock in November 2010 when two large shareholders were selling shares for a total of 8.3 billion dollars. In May 2012, another of BlackRock's large shareholders wanted to sell its stake in the company, and the team invested another 700 million dollars, increasing our ownership in the company to 8.6 percent.

The new mandates were a catalyst for focusing more on capital market transactions. We actively tracked potential initial and secondary public offerings. Our long-term horizon and limited need for liquidity lend themselves to a strategy where we selectively serve as an anchor investor, and we have focused on identifying private companies with the potential to be listed. We started to meet and build a relationship with companies well ahead of any listing to better understand the companies and get to know management and their strategy. Management meetings also allowed us to present the fund and what the company could expect from us as a potential shareholder.

In May 2012, we bought a 4.2 percent stake in Delta Topco for 300 million dollars. Delta Topco was the owner of Formula One, one of the largest global sports brands. We expected an imminent listing of the company, as its board had applied for admission to the Singapore Stock Exchange. When the board then decided in June 2012 to postpone the listing, we chose to remain a shareholder in the company. Delta Topco was subsequently sold to Liberty Media in 2017 in return for listed shares in the latter company and returned 67 percent through to the end of our lock-up period in September 2017. The investment led to significant public attention due to the controversies around the CEO of the company and tax structure issues.

At the end of 2012, the number of companies in the portfolios had increased to 17 and the value of the mandates had increased to 68 billion kroner. The target for 2013 was to continue to rapidly increase the number and value of investments.

While our sector mandates specialising along industry lines produced good results, some investment opportunities were difficult to exploit within this strategy. The sector portfolio managers seek to identify good investments within an industry and fund the investments by selling holdings in companies within the same industry. The capital mandates strategy evaluated industry attractiveness as an integral part of the research. This work was combined with thematic research and research on long-term structural trends and industry disruptions to generate investment ideas.

From the outset, we aimed to identify long-term trends and disruptions, such as changes in

demographics, urbanisation and technological advances. Long-term structural shifts could potentially affect all the industries we invested in. For example, an in-depth analysis of the outlook for global travel which the team conducted in 2013 could be applied across companies operating in areas as diverse as airlines, engine manufacturing, hotels and leisure. In December 2013, we invested 400 million dollars in an initial public offering (IPO) in Hilton. The team had identified the company as an attractive opportunity through its research on global travel. We met both the seller and the management team several months before they had decided to list or act on other potential divestment strategies. We added 428 million dollars to the investment in capital placings in April and June 2014 as the private equity owners continued to reduce their ownership.

In 2013, we also analysed the second-order effects of accelerating e-commerce penetration. The research team consisted of people from our offices in London, Oslo and Shanghai. The idea was to understand how the structural changes taking place within retail distribution would impact other sectors, such as real estate, logistics, retailers, online infrastructure and manufacturing. Logistics was one of the areas where we identified secondary effects that could be positive. The rapid rise of e-retailing led to increased demand for advanced logistics solutions. We initiated a position in Deutsche Post in 2013 due to an expectation that parcel volumes would offset the decline in mail and change the growth trajectory of the company. The change of fortunes for Deutsche Post was partly due to disruption in other industries. At the end of 2013, the number of positions had increased to 28, and the value of the combined portfolio had risen to 142 billion kroner.

In 2014, we ran several other research projects. This resulted in increased investment in companies operating in automation, luxury goods and financial services. However, 2014 was a slower year in terms of new investments, as the portfolio had grown significantly since inception. The value of the combined portfolio increased to 182 billion kroner, but this was largely driven by the market and a weaker krone.

We made several good investments, and the performance in 2012 and 2013 was strong. However, the relative return was volatile, the portfolio had grown rapidly, and it was decided to balance the growth-oriented portfolio with a few value-oriented investments, including a large investment in Tesco plc. These investments did not result from the strategic focus on capital market activity or our thematic research. Some of the investments, and especially the one in Tesco, underperformed substantially, and the results in 2014 negated the good results in 2012 and 2013. The large ownership stakes in single stocks also created a different level of public scrutiny. We elected to review the capital mandates strategy and consider how we could improve going forward.

In 2015, we decided to make some changes. We resolved to bring the team structure more in line with our sector mandates. The long-term holdings and special situations portfolios were combined into one portfolio, with one portfolio manager, as some of the investments could naturally belong to both. We also changed the governance structure, removing the formal anchoring in an investment meeting, and implemented a delegated decision-making structure in line with the sector mandates.

In the period from 2011 to 2014, we typically focused on very large transactions, to source positions for our long-term holdings and special

situations portfolios. Since 2015, we have broadened our focus to include smaller capital market transactions. The idea was to increase the available market for the team and capture more of the opportunities we observe in the market.

In line with the changed governance structure, we set up a separate mandate dedicated exclusively to these capital market transactions. We envisaged that a segregated mandate structure would increase our focus. Over time, this mandate would invest in capital market transactions previously handled by the long-term holdings and special situations portfolios. Capital market transactions typically span the entire spectrum of market capitalisation; in particular, IPOs are more frequent in the small- and mid-cap segments. Our approach to capital market transactions was to conduct independent research and engage early with the companies management, owners and advisors. By doing this, we could both gather additional data and provide feedback to the companies as they were preparing to approach the equity markets. We established procedures to engage with companies under non-disclosure agreements or market-sounding regimes, thereby conducting deeper and earlier due diligence than most other investors.

We also decided in 2015 to reduce the size of the portfolio and the concentration of the holdings. We made this decision to decrease the risk, as the volatility was deemed too high. As always, we did so with care and over time. In January 2017 and February 2018, we transferred some of the assets from the capital mandate portfolios to a transition team to help reduce the exposure. We also made a small transfer in January 2019.

The value of the combined portfolios peaked at 220 billion kroner in 2015 and ended the year at 200 billion kroner. It was then reduced gradually to around 80 billion at the end of 2020.

Developing the mandates 2016–2020

The new strategic thinking around these mandates was now in place. We had good experience from our focus on industry analysis, thematic research and stock picking across sectors. This added a new dimension to how we selected stocks compared to the sector mandates. One mandate continued to focus on investments across sectors with a long-term investment horizon. At the end of 2020, 41 percent of positions had been in the portfolio for more than five years, and this increases to 64 percent when weighted by market value. The investment team focuses on having a relatively concentrated portfolio, although individual position sizes have been reduced since 2015. The top ten positions accounted for 58 percent of the portfolio at the end of 2020. Compared to the earlier period, we typically now seldom acquire a full position size within a short period of time. This means, of course, that we may forego opportunities for excess return, but spreading purchases over time may also reduce risk.

With the decision to downsize the portfolios, we also scaled down the team. The typical sector team was quite small with up to six portfolio managers and analysts. We transferred six of the portfolio managers and analysts to sector mandates or special mandates in October and December 2015, where they took up specialist roles as portfolio managers in various industry teams. In January 2017, another three moved to industry teams in the sector strategy. By 2019, a team of six people managed the capital mandates portfolios.

We continue to have excellent access to companies' management teams, which enables

us to discuss trends and outlook on a regular basis. The evaluation of company fundamentals in combination with industry attractiveness remains core to the investment process. The cross-sector strategy is complementary to our portfolio managers with sector mandates. There are good opportunities to create excess return when we incorporate both an industry and a company view in the selection process.

Capital market transactions serve an essential role in well-functioning equity markets, as they allow companies to list and raise additional equity capital in the market. However, the increased concentration of asset managers, and the rise of indexing, have translated into a different functioning of the market for capital market transactions. Our early and active engagement differentiated us from many other funds that would wait to be approached by the investment banks during the later stages of the transaction. Setting up a separate investment mandate focusing on equity capital market transactions also differentiated us from other large investors, where the team took a syndication role on behalf of other internal portfolio managers.

We gradually developed our activity in 2014 and 2015 and expanded significantly from 2016. The first mandate we set up was global, focusing on all types of capital market transactions across large- and mid-cap stocks. We established additional capital mandates in 2017 and 2019 focusing on the Americas and Asia respectively. The portfolios were managed by individual portfolio managers based in the different regions. One of the portfolio managers was recruited externally, while the other two had worked previously as analysts within the capital mandates group. By the middle of 2020, the values of the positions in the three capital market portfolios had increased to 20 billion kroner.

Our activity in capital market transactions has consisted of participation in IPOs, follow-on capital raises and placings of blocks of shares by other investors. These are transactions where we can play a differentiating role through active engagement, feedback and price leadership. However, our approach to capital market transactions has been selective rather than broad-based. We have selected the transactions based on in-depth analysis of the companies, including elements related to the industry, the fundamentals and the transaction itself, including pricing.

Our increased focus on capital market transactions over the past seven years, and increased engagement with the stakeholders involved, have improved the fund's overall allocations substantially. The fund had a market share of around 0.5 percent in IPOs and relevant follow-on transactions in 2013. By December 2020, the figure had increased to around 1.5 percent.

The market share is now stable from year to year, but the amount of investments will vary depending on market volumes. In 2020, which was a record year for equity capital market transaction volumes, we invested around 3.2 billion dollars in 255 different IPO's. The capital markets team usually accounts for one-third to half the investments in a single year. The rest of the investments are made by our other security selection strategies. The benefit of participating at IPO, and thus avoiding significant purchases in secondary markets, is that the IPO is usually priced lower than where the shares will trade in the secondary markets from the time of listing. In the last five-year period, the combined capital market accounts delivered strong performance in all years except 2018, with three of the years showing double-digit excess returns. The annualised excess return was 19 per cent over the five-year period.

In addition to investing in equity capital market events, the team has also been active in sourcing significant liquidity direct from financial sponsors. While IPOs and secondary share sales are typically underwritten through a broker, purchasing direct from a financial sponsor enables us to invest a significant amount of capital at a negotiated price with the seller. This not only provides us with the liquidity we seek, but also saves the fund substantial transaction costs. From a performance perspective, this also removes liquidity providers or short-term investors from the events, such as when executed through a broker.

We strive to be at the forefront of investing in new asset classes, while operating within the strict guidelines for the fund. While our market share of equity capital market transactions has nearly tripled since 2016, the team continually identifies unique and innovative ways to invest. New instruments have allowed the fund to invest in both high-growth, disruptive companies and established issuers with long track records of success.

The management

The people

The profile of the investment professionals we looked for to handle the capital mandates was largely the same as for the sector mandates. Candidates needed to be strong analytically and have a critical and curious mindset. However, they did not need to have the same deep knowledge of a single industry but could have a broader research background. The differences in the research and investment process led to more emphasis on communication skills and the ability to work in a team-based and less autonomous setting.

The fund has been able to attract talented staff over time on the strength of its offering to employees. Portfolio managers are generally given a high degree of autonomy to create their own investment process and portfolio construction within a set of risk parameters. This has proven an attractive proposition and led to good access to talent. Capital mandates did not offer the same level of autonomy. They did, however, offer very interesting research opportunities in a more team-based working environment. Working across a broader set of industries, combined with the concept of long-term themes and less focus on short-term market volatility, was an interesting proposition. We were therefore able to hire experienced professionals.

It was important from the outset to build a separate investment team for this strategy. The research model was different, and we needed capacity to spend considerable time on both industry and company research. This was deemed especially important given the long-term nature of the investments. In addition, we needed a number of analysts to do research on new opportunities in a short time span in connection with capital placements and IPOs.

The aim was to build the team swiftly, and we added a total of 13 people in the period from May 2011 to May 2014. Nine analysts and portfolio managers were recruited during 2011 and early 2012, three from other internal positions and six external hires, and a further three analysts were recruited externally in 2013 and one in 2014.

The analysts in the team would work alongside portfolio managers who managed sector mandates with full investment decision autonomy. This led to requests for more direct investment responsibility. We tried to solve this by introducing sub-portfolios run by analysts in 2014. They were given autonomy in investment decisions with a requirement that the portfolio to a large extent reflected the main positions in the strategy. We maintained a high overlap, while some positions were idiosyncratic. We ran the structure with sub-portfolios for less than a year, however, as we found that the analysts' attention gravitated away from the main strategy.

The process

An important tenet of the investment process was to consider selection across sectors and long-term themes. Such a process requires people with different backgrounds and expertise to work together. Five or more analysts might be needed to cover research issues that span multiple sectors. The team had broad sector and geographical experience, and the analysts would not be limited to a narrow investment universe, as each analyst would cover two or three industries to have a wider perspective. In addition, the research team would collaborate with specialists across our organisation with expertise in, for example, the Chinese market or specific industries such as autos, retail, luxury goods or banks. Although we use thematic and industry analysis as team projects to generate ideas and better understand industry developments, any investment would be assigned to one responsible analyst.

When working on specific industry or thematic projects, we would analyse how structural trends and potential disruptions would impact industries and specific companies. A team of several analysts with different areas of expertise would work together. Long-term trends and disruptions usually have broad implications across sectors and need a wide set of skills. For example, when analysing the impact of e-commerce in 2013, we included members of our China team due to the advanced use of e-commerce in China at the time. Similarly, we focused on the industries where we thought the impact would be most material. At the time, we included people with experience from industries such as real estate, manufacturing, logistics and retailing. The aim of the analysis was typically to generate investment ideas and identify the companies that would benefit or lose out from long-term trends and disruptions.

The team-based research structure also enabled us to respond swiftly to time-sensitive investment opportunities. It was important to form an investment view within a short time period when it came to capital market transactions. Our extensive research capacity enabled research on a single investment opportunity from several angles. The structure was also beneficial when analysing conglomerates or companies that did not belong clearly to any specific sector. The team could research and understand such companies better, as it spanned multiple industries.

The information sources and analytical framework were largely the same as for the sector mandates. The responsible analyst or team of analysts would meet the company,

often travelling to the company's premises, spend the day there, and meet management at different levels of the organisation. They would also gather information from expert networks, commission data through our primary research group, and analyse public information from both the company and other sources. The information collected and analysed would be aggregated in a financial model for the company, an investment case and a valuation of the company.

Within a structure of delegated decision making, there are limits to how much company-specific risk a portfolio manager will take, and it can be a challenge to foster truly long-term position taking. To overcome these challenges, we tried a more traditional model for capital mandates where the analysts worked together to form an investment view, and then presented the investment case or suggested changes to a position for approval. The interpretation of company and market fundamentals can, however, be complicated, and important and changing views can be lost in a centralised decision-making structure. The lack of delegated authority could lead to misunderstandings and lack of ownership of the investments. We changed this structure in 2015 and made individual portfolio managers responsible for all decisions.

The structure

The benchmarks for both the long-term holdings and special situations mandates would be broad, and as a starting point they would cover all industries. Our consideration of an investment would include an analysis of both the company and the industry dynamics. The portfolios would differ from the benchmark at both issuer and industry level. By design, we wanted to retain the industry exposure. As an example, our position in BlackRock was funded by a broad set of US companies and not only by the financial sector, thus leading to a significant overweight in US financials. This was different from our sector strategy mandates in which the benchmarks are tailored around a narrow industry definition. At the end of 2014, the largest single sector deviation was 14 percent and the sum of the three largest sector deviations was 27 percent relative to the benchmark.

However, the independent capital mandates which we started to scale in 2016 had limited industry deviations. With these mandates, we typically wanted to capture the transaction discounts and the dynamics around the capital market event. Hence, it was more important to reduce other risk factors, such as industry deviations. In addition, all the smaller mandates run by the analysts during 2014 were funded with the specific industries for which they had a special responsibility. This model mirrored the sector mandates model. We decided on this structure in order to better capture each individual analyst's contribution to the overall excess return.

Over time, the broad funding created some challenges, as it was difficult to manage the industry exposures effectively. From 2015, we therefore began funding with companies from the same industry. The sum of all industry deviations has been reduced gradually from around 50 percent at the end of 2014 to below 15 percent today.

The investment focus was on Europe. Relative to other investors, the fund has the strongest position in that region. Europe is also where the fund tends to have the largest ownership stakes due to the regional weightings in the fund's overall benchmark. The funding of the investments would also predominantly be from European assets. At the end of 2014, we had 24 positions in Europe valued at 118 billion kroner,

two positions in Japan valued at 7 billion kroner, four positions in China/Hong Kong valued at 9 billion kroner, and four positions in the US valued at 36 billion kroner. We had some regional deviations and funded most of the Asian purchases with the sale of US or European companies. At the end of 2014, we had an overweight in Asia of 9 percent.

The investment targets would first of all be large companies. Large companies tend to be more multinational and are therefore well suited to analysis from large financial centres, while local managers tend to have an advantage when analysing smaller companies with less sprawling businesses. We also targeted large companies because we wanted to make large investments while keeping our ownership below 10 percent of the company. We used significant resources to do in-depth fundamental research, and we also needed to have some liquidity to facilitate changes to our single-company exposure. The average position size in the portfolio at the end of 2014 was 5 billion kroner, and the largest was 23 billion kroner. We had three positions above 10 billion kroner and 13 positions above 5 billion kroner. In total, we had 35 investments at the end of 2014. The investments would only be funded with large companies.

The combined number of positions has increased significantly over the years. The chief reason for this is the increased number of investments in the mandates that invest in capital market transactions only. As we decided in 2015 to start participating in a broader range of transactions, the number of positions in June 2020 was 118, of which 86 were related to the three capital markets mandates and the rest to the cross sector selection portfolio.

Chart 51 Net asset value. Billion kroner.

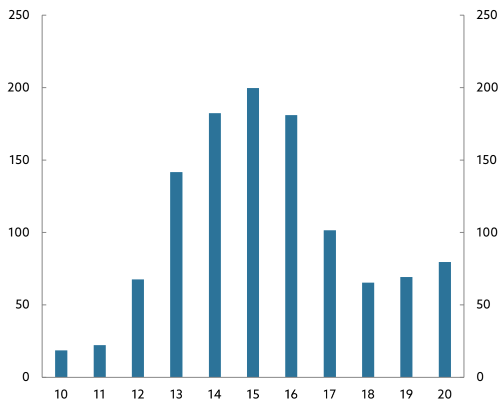


Chart 52 Number of mandates.

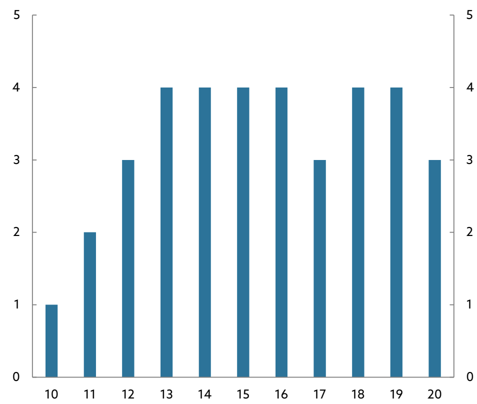


Chart 53 Market value of overweights. Billion kroner.

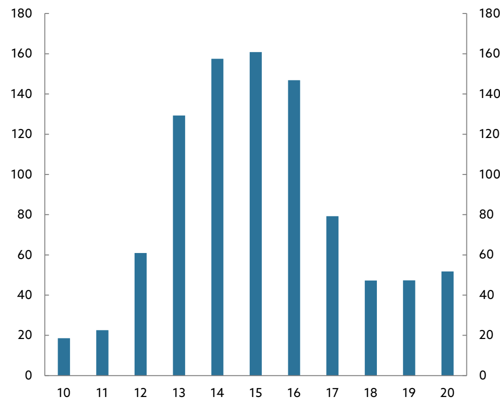


Chart 54 Contribution to the overall equity fund's active share. Percent.

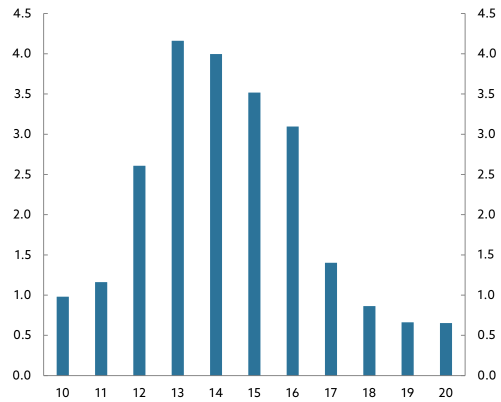


Chart 55 Percent of benchmark companies in the aggregate portfolio.

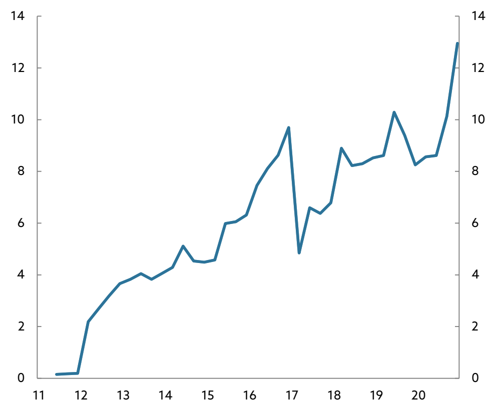


Chart 56 Median number of companies across mandates.

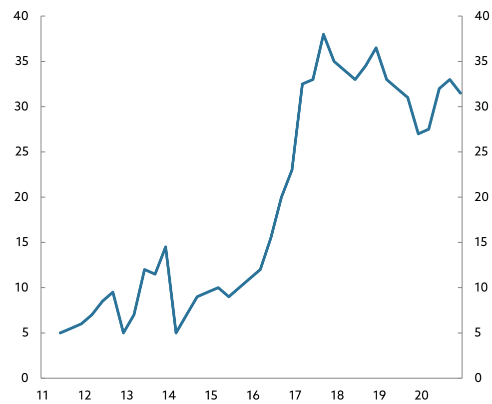


Chart 57 Active share of the aggregate portfolio. Percent.

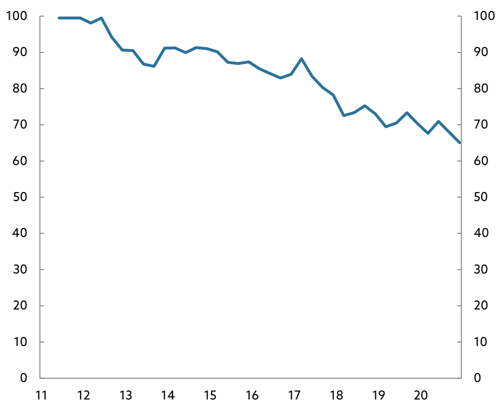


Chart 58 Average share of top ten holdings across mandates. Percent.

The returns

From inception in December 2010 to the end of December 2020, our capital mandates achieved an absolute return of 10.4 percent on average per year. In comparison, the benchmark for the capital mandates returned an annualised 9.1 percent in this period. The capital mandates have thus produced a relative return of 1.3 percent on average per year since inception.

Cumulatively, the absolute return was 171 percent, while the benchmark return was 141 percent. The cumulative outperformance was thus 30 percent on an arithmetic basis and 13 percent on a geometric basis. The monetary value of the cumulative outperformance is 5.5 billion kroner, before costs and without taking any effects from reinvesting into account.

Measured over the entire period since inception, the average annual tracking error is 7.4 percent, while the information ratio is 0.2.

In the first five years and one month from December 2010 to December 2015, the annualised relative return was -1.2 percent with an information ratio of just below zero. In the five years from January 2016 to December 2020, the annualised relative return was 3.8 percent with an information ratio of 0.8.

Over the full period, capital mandates have had an asset-weighted annualised relative return of 0.3 percent. This compares to a 1.3 percent relative return on a time-weighted basis. The assets in capital mandates increased steadily from inception to 2015, but were later scaled down. The asset-weighted calculation therefore gives more weight to returns in the 2014-2016 period and less weight to returns before and after. The main reason for the lower return on an asset-weighted basis is the high weight given to the performance in 2014, when capital mandates underperformed their combined benchmark by almost 10 percent.

Capital mandates as a whole outperformed their combined benchmark in 54 percent of the months between December 2010 and December 2020. In up-markets, they outperformed in 65 percent of months, and in down-markets, 35 percent of months.

In the first year, the combined portfolio was very concentrated and of limited size, mostly consisting of a few positions transferred from other parts of the organisation. Compared to the rest of the period, the portfolio had significantly higher volatility of returns due to so few positions. The combined portfolio underperformed its benchmark by more than 5 percent in 2011, including December 2010. However, this was not dramatic compared to the high tracking error of 17 percent.

The strategy matured in 2012 and 2013. Additional funding was provided in these years, and we built relatively large positions in several companies. The value of the combined portfolio increased from 22 billion kroner at the end of 2011 to 142 billion kroner at the end of 2013. Results were good, with an annualised outperformance of more than 5 percent in 2012 and 2013. Tracking error declined to 7 percent.

In 2014, the combined portfolio underperformed its benchmark by 10 percent. The main contributor to this underperformance was the large investment in Tesco, but other large positions also underperformed. The portfolio regained most of this loss early in 2015, but then lost most of what had been regained over the remainder of the year. The larger size of the combined portfolio and individual positions meant that the losses were larger and more visible in absolute terms than the gains the years before.

The changes to the mandates in 2015 reflected lessons from the first few years and mostly entailed implementing autonomous decision-making structures and broadening the investment universe for capital market transactions. Otherwise, the basic ideas behind the strategies were intact. Following the adjustments, the strategies of investing across industries and investing in capital market transactions have performed very well. In the five years to the end of 2020, the average relative return per year was 3.8 percent. The overall monetary value of this outperformance was 14 billion kroner.

Table 7 Annualised performance.

	2010-2015	2016-2020	Full period
Portfolio return	8.3	12.6	10.4
Benchmark return	9.4	8.8	9.1
Relative return	-1.2	3.8	1.3
Tracking error	9.3	4.7	7.4
Information ratio	0.0	0.8	0.2

Chart 59 Cumulative relative return of the aggregate portfolio. Geometric difference in percent.

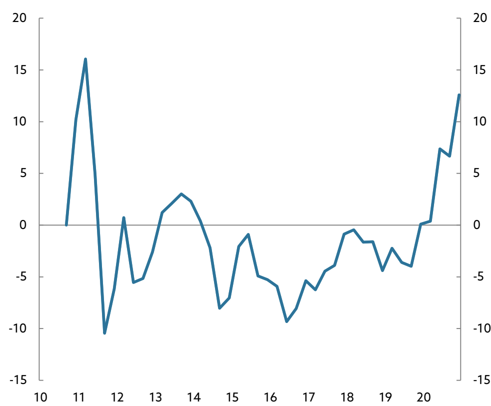


Chart 60 Cumulative relative return. Billion kroner.

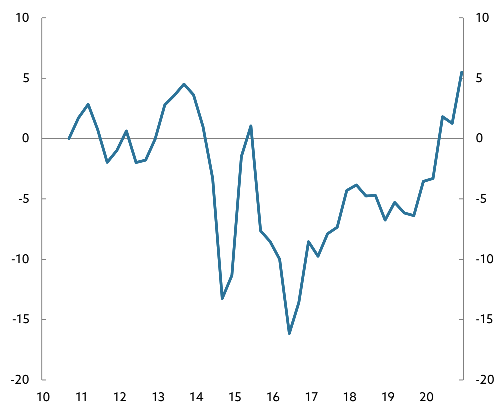


Chart 61 Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis) of the aggregate portfolio by distinct periods.

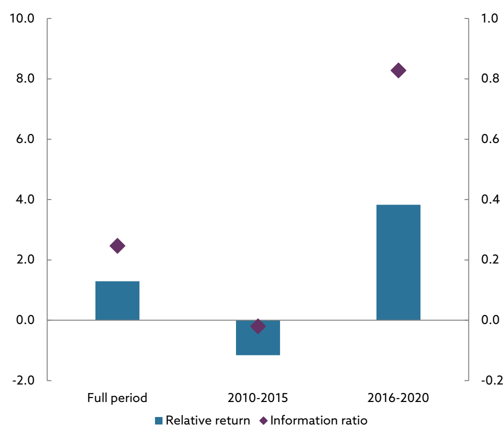
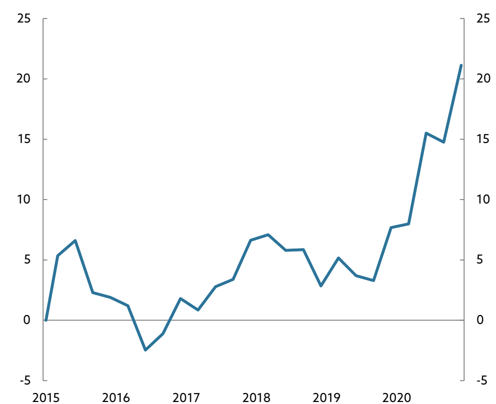


Chart 62 Cumulative relative return of the aggregate portfolio from the start of 2015. Geometric difference in percent.



The environmental mandates

The portfolio managers for our environmental mandates invest in companies likely to benefit from the transition towards lower emissions and a greener economy. Investing in these types of companies requires in-depth company and technology knowledge to uncover future trends.

We established our first environmental mandates in December 2009. These mandates can be divided into three categories: low-emission energy and alternative fuels, clean energy and energy efficiency technologies, and natural resource management.

Our experience of investing in environment-related companies has been good, but not without its challenges. The market is characterised by frequent and major changes, both in the form of an ever-changing opportunity set, driven by disruptive technology and new market entrants, and in the form of an unpredictable policy framework.

The history

Establishing the mandates 2010–2015

During the broad public evaluation of the fund's ethical guidelines in 2008, the Norwegian government indicated that it would assess positive selection as a tool for investments in environmental technology. In the national budget for 2010, Norges Bank was assigned the task of establishing separate "environment-related" mandates within the fund's existing investment universe. The Ministry of Finance stated in the budget that its intention was that these investments should eventually amount to 20 billion kroner.

The fund's mandate was revised to include specific reporting requirements for environmental investments from the beginning of 2011, but an explicit requirement to make environment-related investments was not added until 29 June 2012. At that time, the range was set at between 20 and 30 billion kroner.

We established our first two internal environmental mandates in December 2009, one focusing on clean energy and renewable energy equipment and one on water and waste management, with a combined allocation of 5.5 billion kroner. These mandates were initiated while the discussion about the overall role of environmental mandates in the fund was still going on. The mandates built on our experience of sector mandates, and the portfolios were managed by managers in our utilities team.

The first mandates took our work on the expectation documents on water management and climate change as their starting point. These issues have been priorities for the fund for more than a decade, and we published our first expectation documents in these areas in 2009 and 2010. Water management and climate change issues, including physical impacts and regulatory and technological responses, give rise to risks and opportunities for companies. How companies manage transition and physical risks related to climate change and water risks, and capitalise on opportunities in these areas, may drive long-term returns.

In 2010, an additional 9.1 billion kroner was allocated to the two internal environmental mandates. The investment universe for the clean energy and renewable energy equipment mandate was also expanded to include conventional electricity companies with carbon-free electricity production so that the mandate could be scaled up. The market value of internally managed environmental investments was 14.5 billion kroner at the end of 2010. From January 2011, the fund established a dedicated environmental team within the sector mandates.

The same year, the water and waste mandate was broadened to include technologies and services related to natural resource, water and waste management. The carbon-free conventional electricity companies were removed from the clean energy and renewable energy equipment mandate, and there was instead an increased focus on companies involved in energy efficiency, typically classified within the industrial or technology sectors.

2011 was a difficult year for environmental investing, particularly in the clean energy and related technologies universe, due to expected subsidy cuts in Europe for renewable energy at the same time as competition from Chinese solar manufacturers drove down the price of solar panels. The market value of the internally managed portfolios ended the year at 12 billion kroner.

The portfolio structure was unchanged during 2012, and internally managed assets finished the year at 12.7 billion kroner. In 2013, a number of solar and wind companies staged a very strong share price recovery. Together with strong stock markets in general, this drove an increase in assets to 19 billion kroner by the end of the year.

From 2014, the team was further strengthened, and two new mandates were added – one for water technologies and one for low-emission energy and alternative fuels. The latter concentrated on the actual generation of energy and therefore consisted predominantly of utilities companies involved in the production of renewable energy or the operation of electricity or gas infrastructure. It also included some companies in industrial gases that facilitate cleaner fuel production and reduce carbon emissions in certain industrial processes.
The clean energy and energy efficiency mandate was refocused on equipment for producing clean energy as well as a wide range of efficiency technologies, including companies typically classified as industrial or technology stocks. Examples of companies in this area are producers of wind turbines and electric cars, and providers of building control systems that reduce electricity consumption. The intention behind these changes was to allow further specialisation as well as scaling of the environment-related investments. At the end of 2014, the market value of the internal environmental mandates had increased to 24.8 billion kroner.

Throughout 2014 and 2015, we also further developed the framework for our internal

environmental investments, establishing a formal definition of the universe and a database to track the companies we considered eligible for inclusion in the environmental universe. This work involved defining groups of companies that had activities addressing different environmental problems and setting thresholds for how much of their business had to be in these beneficial activities. Having now spent several years gaining experience and gradually developing the investment universe, we were in a position to scale up the portfolio considerably from 2015 onwards.

The range for the fund's environmental investments specified in our mandate was increased twice during 2015 to between 30 and 60 billion kroner, and then to the current interval of 30 to 120 billion kroner from 30 November 2019.

In July 2015, the internally managed mandates were concentrated on large-cap companies in developed markets to ensure scalability and to avoid some of the governance challenges more prominent in emerging markets. In addition, the separate water technology mandate was terminated, with its investment universe integrated into the natural resource management mandate. A new mandate for environmental small caps was established at the same time, while the low-emission energy and alternative fuels portfolio was allocated an additional 4.1 billion kroner. The small-cap mandate was meant to allow broad exposure to smaller environmental companies by being invested more along the lines of an index portfolio, but was terminated later the same year in light of the governance risks associated with some of these small companies. The funds were used to create an overlay portfolio covering the entire opportunity set for the environmental mandates. The purpose of the overlay portfolio is to scale up good ideas generated by the portfolio managers in the team beyond what they could do themselves. At the end of 2015, the market value of the four environmental mandates stood at 34.5 billion kroner.

Developing the mandates 2016–2020

After a number of changes to the portfolio structure in 2015, it stayed unchanged throughout 2016. One analyst in the team was promoted to portfolio manager and took over the formal responsibility for the low-emission energy and alternative fuels portfolio. The environmental mandates continued to outperform during 2016, but there was no further funding. At the end of the year, the mandates had a value of 37.1 billion kroner.

In 2017, the environmental mandates delivered strongly in terms of both absolute and relative return and reached 45.7 billion kroner at the end of the year. The industrial sector was the most significant contributor to the absolute return, due to both its share of the portfolio and the strong stock price performance of the companies in question. We reviewed the definition of the environmental universe once again during the year. In some sub-segments, we decided to narrow the definition of what we considered environmental, given that newer and more impactful technologies were becoming investable. We therefore removed some companies whose environmental impact was now less meaningful.

The strong performance of the industrial stocks in the portfolio reversed in 2018. This was partly offset by a good performance by the utilities companies in the portfolio, but contributed to assets falling to 43.3 billion kroner at year-end. The external environmental mandates were terminated during the year, and all environmental equity assets have since been managed internally.

In September 2019, we created a new mandate to focus on mid-cap companies in the clean energy and energy efficiency technologies universe. This is a very large universe, and it had not been possible for a single portfolio manager to look at mid-cap companies too in any significant depth. The environmental portfolio saw very strong relative and absolute performance during the year, growing by 44 percent to 62.3 billion kroner. The utilities companies in the portfolio continued to do very well in both absolute and relative terms, and industrial companies again contributed strongly to the absolute return.

The beginning of 2020 saw market turmoil due to covid-19, but the portfolio continued its strong performance throughout the year. A number of new companies that are involved in relevant environmental technologies came to the market during the year, creating more opportunities for investments in pure-play companies going forward. We increased the funding of the environmental mandates somewhat, and this combined with a strong relative return to take the five internally managed equity mandates to a total value of 99 billion kroner at the end of 2020. The assets are invested in a selection of the approximately 140 companies that are defined as our environmental investment universe.

In December 2016 we adjusted the funding of the environmental mandates by increasing the proportion of utilities sold to ensure that the environmental portfolio had a positive effect on the fund's carbon footprint. From 1 March 2018, we further changed the funding to match the sector composition of the investments. The aim was to limit the financial risk from sector deviations between the funding and the investments. This change also further improved the carbon intensity profile of the fund.

The management

The people

When we started up our internal environmental mandates in December 2009, this was very much a nascent investment field. As such, there were no "environmental portfolio managers" or "environmental analysts" to hire. It was therefore a case of finding people with the right aptitude and background who could help develop this area. As the themes span a number of sectors and are rapidly evolving, we have looked for people with the ability to take a broader view and project far into the future what the impact of new technologies may be. Our initial focus being on climate change and water in line with our expectation documents, it was natural to start our environmental investment efforts within the existing utilities team. Two portfolio managers on that team were therefore given an environmental portfolio to manage in addition to their utilities portfolios.

As our environmental assets became more meaningful in the course of 2010, it was decided to create a stand-alone environmental team, which took place from the beginning of 2011. One of the utilities portfolio managers moved across to this team to manage the two portfolios. In June 2011, we recruited a portfolio manager to take responsibility for the water and waste portfolio.

In 2014, another portfolio manager and an analyst joined the team. Both had a background in the broader energy market, including both oil and gas and renewable energy. In April 2016, the analyst was promoted to portfolio manager and took over responsibility for the low-emission energy and alternative fuels portfolio. At the same time, we hired another analyst who had a background in Asian technology and battery-related companies. This strengthened our knowledge in this fast-developing area and

allowed us to broaden and deepen our focus on clean energy and energy efficiency technologies. He went on to manage his own portfolio from September 2019. Throughout, we have had a number of analysts attached to the team before going on to graduate studies or to other roles inside or outside Norges Bank Investment Management.

As mentioned above, the environmental investment themes span many different sectors, requiring the environmental portfolio managers to look more at the bigger picture than our typical sector portfolio managers and consider how the themes will impact different industries. Realistically, they will not then be able to have as deep an understanding of any particular sector as the sector portfolio managers do. However, with the organisation having both sector specialists with very deep industry knowledge and portfolio managers following the broader environmental themes, there is much to be gained from having them work together. Given the importance and complexity of the energy transition needed to meet the Paris Agreement goals, we decided that it would be beneficial for the environmental team and the energy team to be closely aligned and give us the best possible understanding of developments in this area. Organisationally, the environmental and energy teams were therefore combined in October 2019, although the environmental portfolios were still ring-fenced to meet the investment mandate requirements.

The process

The Ministry of Finance's Report to the Storting No. 20 (2008-2009) stated that investments under the environment-related programme should be expected to "yield indisputable environmental benefits, such as climate-friendly energy, improving energy efficiency, carbon capture and storage, water technology and management of waste and pollution". At the same time, there is an expectation that the environment-related investments should deliver at least the same return as the fund overall.

Our investments were thus to be in environmentally friendly solutions rather than a strictly defined market sector. The environmental segment is a poorly defined universe, faced with an ever-changing opportunity set of disruptive technologies, new market entrants and unpredictable policy frameworks. As a starting point, we therefore must define the environmental universe – a key difference to the traditional sector management.

Exactly what type of activities qualify as environmental is a matter of judgement. One area where there is a debate about the environmental merits is natural gas. On the one hand, it is clearly a fossil fuel and contributes to greenhouse gas emissions. On the other, it is a transition fuel that can help speed up the move away from coal. Renewables such as solar and wind power are intermittent, and appropriate and cost-effective energy storage has yet to be developed at scale, so there is a need for other energy sources that ensure a reliable supply of power when users need it. Another reason why we chose to include natural gas infrastructure is the potential for it to be used for greener alternatives in the future. At times of oversupply of renewable electricity, the excess electricity could be used to power electrolysers that generate green hydrogen by splitting water into hydrogen and oxygen. The green hydrogen could then be stored in the natural gas infrastructure – either for conversion back into electricity using a fuel cell, or for other uses such as blending it into the gas grid to reduce the carbon footprint of heating buildings.

To define a universe that fulfils the criteria set out in the investment mandate, we need to have a good understanding of the environmental exposure of the companies concerned. The portfolio managers will therefore carry out an annual assessment of companies defined as environment-related, and the results are stored in an internal database. Events during the year, such as mergers and acquisitions, may change the mix of environmental exposure, which is inevitably a somewhat subjective assessment anyway, as companies do not always report in enough detail to give us all the required information. We have therefore established some rules to standardise the assessment, where we make assumptions about the environmental content of certain types of business lines. Particularly in energy efficiency, solutions are often developed by what are best characterised as conglomerates. How large the environmental side of the conglomerate needs to be before an investment is justified is a matter of judgement. In 2015, we set a minimum level of environmental exposure for a company to be eligible for investment, requiring at least 20 percent of its business to be defined as environment-related. The portfolio managers must also assess any exposure to coal, oil and nuclear, which is used for negative screening if it exceeds 20 percent of the business.

The definition of what activities should count as environment-related, and what proportion of a company's activities needs to be environment-related to include it in our environmental universe, will continue to evolve. We will keep on refining our definition of the environmental universe accordingly.

How companies outside the environmental universe react to industry developments is also important to understand. For example, in the energy market, the traditional oil majors and utilities are gradually, although to differing degrees, accepting that they need to make their business less carbon-intensive. How aggressively they attack this new opportunity will also have investment implications for our environmental universe. The portfolio managers therefore need to monitor a broader set of companies than those they are able to invest in. They do that by speaking with colleagues who follow these traditional companies, participating in industry studies and generally keeping on top of the broader themes they are following, whether energy efficiency, energy transition or efficient use of natural resources.

A common denominator for developments across the environmental investment universe is the importance of government action. This could be in the form of emissions standards for certain industries or products, subsidies to encourage a transition towards more environmentally friendly products, or other regulatory action. To enable successful selection within the environmental universe, it is therefore crucial to stay on top of the actions of governments, and hence we spend a significant amount of time on this.

When government support has enabled the scaling up of production, equipment costs gradually come down, and eventually environmental technologies become competitive without government support. At that stage, the end-market becomes significantly larger, since the government support is usually limited to certain countries or markets. For many products, such as electric cars or green hydrogen, we are still not at a stage where they are generally competitive with conventional products. However, in order to forecast the long-term value of the companies we invest in, it is important to take a view on when this will happen. We therefore work to build deep insight into the development of the

cost curve for these products, for example by participating in industry studies.

While our environmental investments are organised along themes, many of the companies we invest in are part of the sector coverage in our main stock selection strategy. There is therefore a high degree of collaboration with the sector portfolio managers who cover companies where there is overlap. This might take the form of attending company meetings together, sharing research or debating the merits of an investment in a company.

The structure

A number of index providers have developed environmental indices. The index composition is defined at the providers' discretion, and there appears to be little consensus among them, as defining what counts as environmentally friendly is to some extent a matter of judgement. For example, some classify nuclear power as clean energy despite the challenges of dealing with waste. Historical returns on the different environmental equity indices have varied due to different specifications, not only between providers but also between a provider's different products. We have therefore found it more meaningful to define ourselves what we include in the investment universe. This ensures that we can justify why a company should be classified as environment-related, that the universe is investable given our mandate, and that we can participate in new developments before companies are included in an index. The characteristics of the universe mean that this is an area particularly suited to active investment. To avoid companies that are poorly positioned, while uncovering disruptors and winners, we need to develop a deep understanding of the new technologies and government and industry developments.

Initially, the environmental mandates were funded in the same way as our sector mandates, where the portfolio managers' benchmarks were also the funding for the mandates. However, when it became a mandate requirement to over-allocate to environmental investments, this was no longer possible. We therefore had to change the funding, as we discuss further below. We then had to create a separate set of benchmarks for the environmental portfolio managers made up of companies defined as environment-related. These benchmarks were both a signal of what the focus area for the portfolio manager should be and a yardstick that they were measured against.

The first two internal mandates were created in December 2009, one for clean energy and renewable energy equipment and one for water and waste management. The focus of these two mandates was on pure-play environmental companies. We found that this presented a challenge as our assets increased, since the market capitalisation of listed pure-play environmental companies was limited. In late 2010, therefore, we included nuclear and hydro-based conventional utilities in the clean energy and renewable energy equipment mandate. Following the Fukushima nuclear accident in March 2011, however, this decision was reversed, as the accident highlighted the downsides of nuclear power.

The pure-play companies were also mostly focused on a narrow area of the economy, exposing the portfolio to a high degree of volatility. We experienced this particularly in 2011, when subsidy cuts in Europe hit renewable energy producers. At the same time, Chinese companies in the solar manufacturing value chain competed aggressively with a massive increase in capacity, driving down the price of solar panels by 40 percent. While this was good

for the development of solar power in the longer term, it significantly impacted the share prices of solar panel manufacturers. As our portfolio grew, we therefore broadened the investment focus to include companies where not all activities could be classified as environment-related. In 2011 we included companies involved in energy efficiency in the clean energy mandate to broaden the investment universe.

As mentioned above, the fund can only over-allocate to environmental investments by selling assets that it does not define as environment-related. From early 2013, the funding of the environmental mandates was therefore changed from an index based on the companies the portfolio managers invest in to funding with global equities. This meant that environmental investments were funded by selling a slice of all the equities in the fund's equity benchmark. This was the simplest way to over-allocate to environmental investments.

Over time, it became clear that broad global equity funding created two challenges. First, it presented a challenge in terms of carbon footprint. To reduce carbon emissions, the world needs an energy transition towards renewable energy generation. Many of the key drivers of this energy transition are utilities that also have some legacy assets for power production. Although they may have a lower carbon footprint than the average utility, they still have a large carbon footprint compared with the average company in the fund's equity benchmark. The broad global equity funding therefore meant that the environmental investments served to increase the fund's overall carbon footprint, since we invested relatively more in these utilities than the fund's benchmark. The first step in dealing with this issue was made in December 2016 when we increased the proportion of utilities companies sold to fund the environmental portfolio. By selling more of the utilities that did not qualify for inclusion in the environmental portfolio, we ensured that the overall effect of the environmental allocation was to reduce the fund's carbon footprint.

The second challenge with broad global equity funding is the financial risk this creates. A large proportion of the companies involved in renewable energy and energy efficiency are in the utilities and industrial sectors. However, in this broad funding, sectors such as financials, consumer goods and services, health care and technology had a significant weight. As a result, the environmental portfolio significantly increased the fund's exposure to utilities and industrials. Over time, the funding has therefore been further refined to better match the environmental investment universe. This has involved matching not only the sector exposure, but also to some degree the size and regional exposure of the funding and the environmental investment universe. This tailoring of the funding has also further improved the carbon footprint of the fund's portfolio, as selling more industrials rather than, say, financial or health care companies has brought a reduction in carbon intensity.

As indicated above, we track the carbon footprint of the environmental portfolio and the related funding. Weighted by net asset value, the portfolio's carbon intensity (scopes 1-2) at year end 2020 was 456 tonnes of CO2-equivalents per million dollars of revenue, compared to 687 tonnes for the stocks sold to fund the mandate.

At the end of 2020, the funding was made up of 808 companies, while the environmental portfolio consisted of 90 company holdings.

Chart 63 Net asset value. Billion kroner.

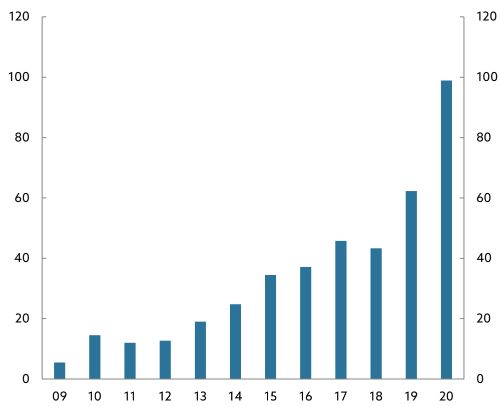


Chart 64 Number of mandates.

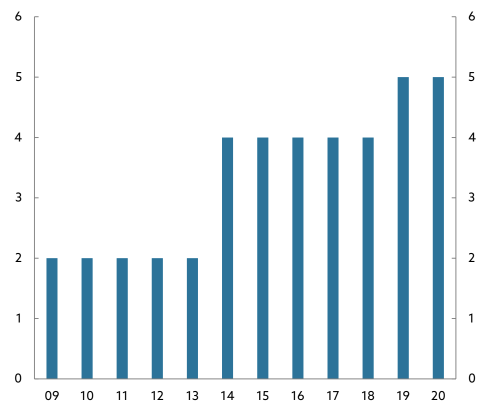


Chart 65 Market value of overweights. Billion kroner.

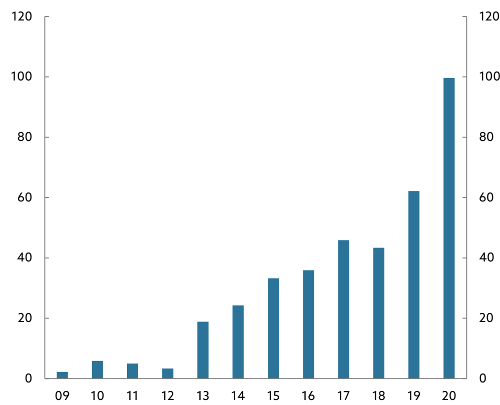


Chart 66 Contribution to the overall equity fund's active share. Percent.

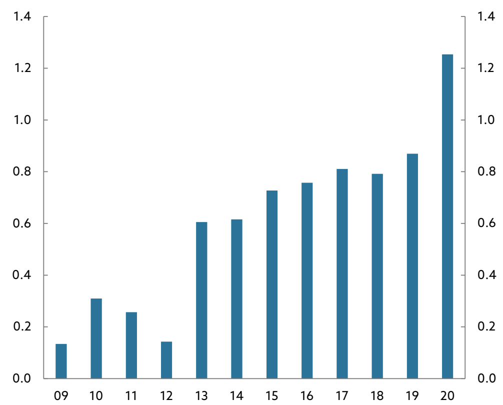


Chart 67 Percent of benchmark companies in the aggregate portfolio.

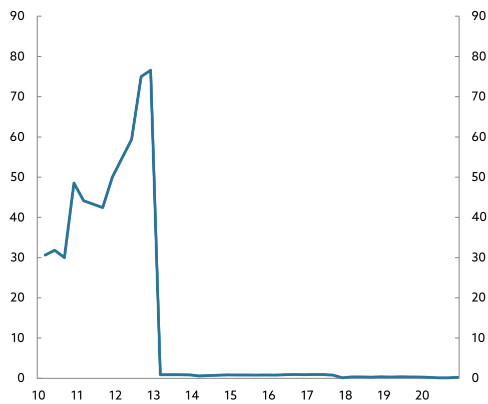


Chart 68 Median number of companies across mandates.

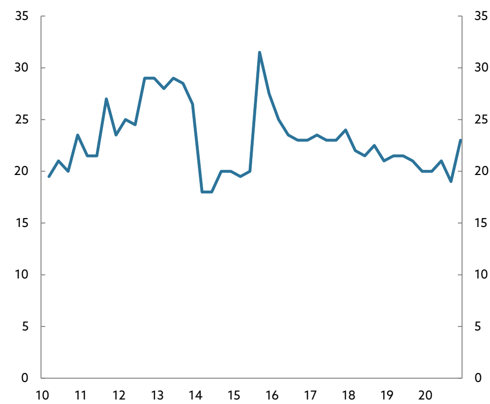


Chart 69 Active share of the aggregate portfolio. Percent.

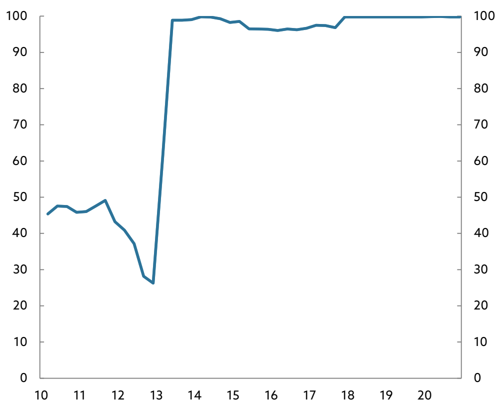
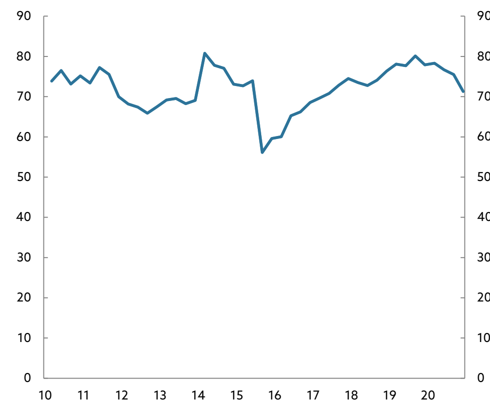


Chart 70 Average share of top ten holdings across mandates. Percent.



The returns
From inception in January 2010 to the end of December 2020, our environmental mandates achieved an absolute return of 10.6 percent on average per year. In comparison, the benchmark for the environmental mandates returned an annualised 6.2 percent in this period. The environmental mandates have thus produced a relative return of 4.4 percent on average per year since inception.

Cumulatively, the absolute return was 203 percent, while the benchmark return was 94 percent. The cumulative outperformance was thus 108 percent on an arithmetic basis and 56 percent on a geometric basis. The monetary value of the cumulative outperformance is 29 billion kroner, before costs and without taking any effects from reinvesting into account.

Measured over the entire period since inception, the average annual tracking error is 5.0 percent, while the information ratio is 0.8.

The relative returns were mildly negative in the first six-year sub-period from 2010 to 2015 at -0.6 percent annualised, but significantly positive in the period from January 2016 to December 2020 at 10.8 percent annualised. The corresponding information ratios were -0.1 and 2.0.

Over the full period, the internal environmental mandates had an asset-weighted annualised relative return of 8.6 percent. This is much higher than the 4.4 percent relative return on a time-weighted basis. As mentioned above, the portfolio underperformed mildly in the first six years but has shown strong relative performance since. Consequently, asset-weighted returns have been better than time-weighted returns, as the value of the portfolio was relatively small in the early years.

The internal environmental mandates as a whole outperformed their combined benchmark in 61 percent of months between January 2010 and December 2020. In up-markets, they outperformed in 68 percent of months, and in down-markets, 50 percent of months.

The first couple of years were challenging in terms of performance. The investment universe was initially focused on fairly narrow segments, and these were very volatile. After carbon-free conventional electricity companies were added to the investment universe at the end of 2010, the relative return was hit by the Fukushima disaster in early 2011. That year also saw sharp declines in the share prices of solar panel manufacturers due to very aggressive competition from Chinese solar manufacturers, and cutbacks in government incentive schemes in Europe in 2011 and 2012 also impacted the universe. We nevertheless managed to outperform in 2012. We also saw strong outperformance in 2013 when a significant part of the environmental universe performed well, including a strong recovery by renewable equipment companies.

Over the past two years, the share prices of companies we have identified as environment-related have significantly outperformed other companies in the same industries used as a funding source. One well-known example is Tesla, which has heavily outperformed the rest of the automotive industry, with the stock going up 740% in 2020 and ending the year by being included in the S&P500 index. The same relationship holds for most other industries included in the environmental investment universe. However, by far the largest contribution has come from our investments in the utilities sector, where companies at the forefront of investing in renewable energy have significantly outperformed the utilities companies used in the funding.

Part of the explanation is probably the increased interest in sustainable investments, generating additional investment demand for these companies. The companies defined as environment-related are also, on average, more likely to be seen as growth stocks, given that they tend to be more aggressive in pushing into this new and evolving business area. On the other hand, the companies sold to fund investments in these stocks would typically be seen more as value companies. Since the value factor in general has seen underperformance during this time period, this is probably also a contributing factor in the outperformance by environmental stocks.

Table 8 Annualised performance.

	2010-2015	2016-2020	Full period
Portfolio return	4.5	18.3	10.6
Benchmark return	5.1	7.6	6.2
Relative return	-0.6	10.8	4.4
Tracking error	4.7	4.9	5.0
Information ratio	-0.1	2.0	0.8

Chart 71 Cumulative relative return of the aggregate portfolio. Geometric difference in percent.

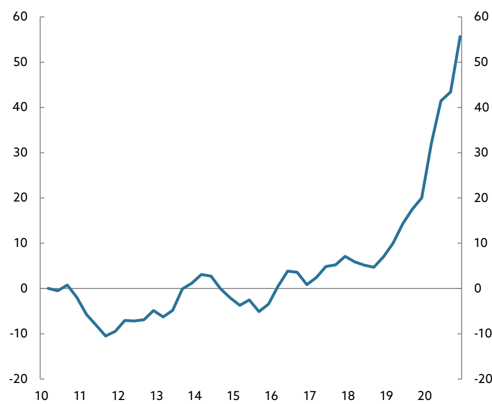


Chart 72 Cumulative relative return of the aggregate portfolio. Billion kroner.

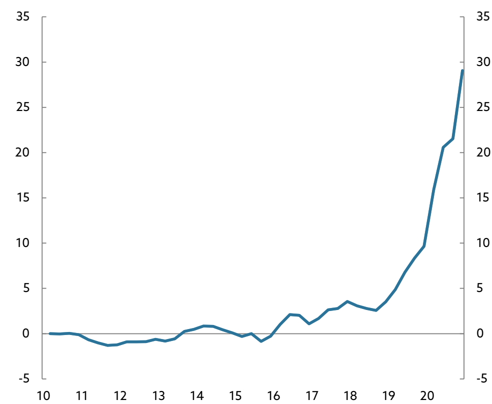


Chart 73 Annualised relative return and tracking error in percent (left-hand axis) and information ratio (right-hand axis) of the aggregate portfolio by distinct periods.

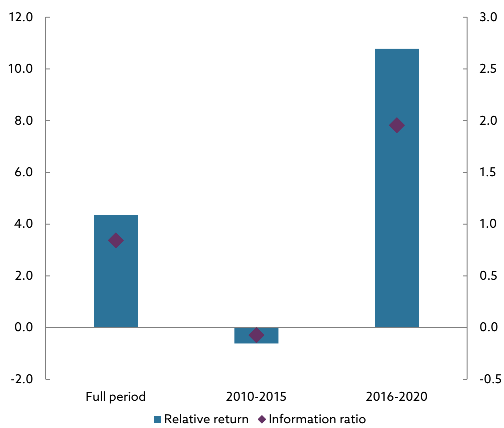
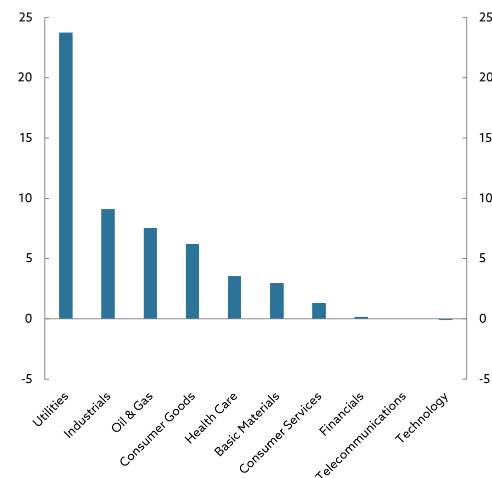


Chart 74 Contribution to relative performance by industry from March 2018 to December 2020. Percent.



The China mandates

The Chinese stock market has been growing rapidly for the last two decades. Having portfolio managers on the ground with local knowledge helps steer our investments in China and provides valuable insight for our investments in the rest of the world.

The domestic Chinese stock market (China A) was closed from 1949 until it reopened at the end of 1990 with the listing of eight stocks. By the time the fund opened an office in Shanghai in November 2007, there were approximately 1,500 companies listed in the domestic market. Over time, the China A market has grown to be the world's second-largest with a market capitalisation of over 10 trillion and close to 4,000 listed companies.

When we first set up the internal active China team, it was to manage part of our investments listed on the domestic exchanges. Its remit was later broadened to include Chinese companies listed in Hong Kong and on foreign exchanges. Over time, the team has delivered very significant outperformance from stock selection in the Chinese market.

The history

Investing in the China A market 2005–2010

For reasons related to regulation and access to different investor bases, Chinese companies are listed on many different exchanges. Shanghai and Shenzhen are the most important in terms of market capitalisation, with mostly China A shares which trade in Chinese yuan. There are also some B shares traded on the same exchanges in US and Hong Kong dollars. Another major venue for Chinese companies is the Hong Kong exchange. For technology companies, the US exchanges have been a popular listing venue over the past decade. These stocks are typically referred to as N shares.

The fund was first allowed to invest in Chinese companies in January 2004, and the first Chinese companies became part of our benchmark in the fourth quarter of 2008. These were companies listed in Hong Kong.

We started to invest in the China A market in 2005. We believed that this market would continue to expand and become an important part of the global equity market. We therefore wanted to be exposed to this growth, as well as to increase our understanding of the market. Investing in the domestic market also had other benefits. The Chinese stocks initially included in the fund's benchmark were dominated by financials and resources companies, and the domestic market gave broader exposure to important growth sectors, such as those exposed to the expanding export industry, as well as increasing consumer demand.

The only way to invest in the domestic Chinese stock market at the time was through the Qualified Foreign Institutional Investor (QFII) programme. To obtain a QFII quota, potential investors would go through a lengthy application process, with strict requirements that had to be met. When the fund started to invest in China A shares in 2005, this was initially achieved by borrowing part of the quota from an investment bank. From January 2008, however, the fund was awarded its own quota, initially of 200 million dollars. Over time, as the Chinese authorities gradually allowed more foreign investment, our quota was increased. Ours was generally the largest, or one of the largest, throughout the period, ending at 2.5 billion dollars. In May 2020, the Chinese authorities removed the quota limit, reflecting the gradual opening up of the country's financial markets.

At first, given its limited size, the QFII quota was managed by external active managers with some internal enhanced index management. In 2011, however, the fund decided to establish a team to manage the internal portion actively. Part of the reason was the potential for outperformance in the China A market, both by finding good companies to invest in, and by reducing the risk of investing in companies that would eventually fail or significantly underperform. As in other emerging markets, environmental, social and governance (ESG) risks are typically considered to be higher in China than in developed markets, as standards and enforcement are typically less consistent. In addition, the long tail of relatively small companies makes it hard to monitor the large number of investments that would follow from an indexing strategy. It was therefore beneficial to concentrate investments through active management, with a portfolio manager analysing a company before making the investment, thus reducing the financial risks associated with sustainability and governance.

Another reason for setting up an internal active management team in China was a recognition that the country was becoming an important market for many large companies listed in developed markets. It was therefore important to have a good understanding of the Chinese market. Due to language and cultural issues, it was and still is challenging for non-Chinese to have a full understanding of the market. The internal team could therefore, in addition to managing its own portfolios, be of value to other parts of the organisation. The importance of the Chinese market to other areas of the portfolio is also reflected in the attention given to the market by the fund's top management, who made regular trips to China to further their understanding.

Establishing the mandates 2011–2015

Starting from August 2009, we had already hired a team of Mandarin-speaking analysts in Hong Kong through an outsourcing arrangement with a bank. These analysts were assigned to various sector teams. Their role was to help the sector portfolio managers get a better understanding of some of the big Chinese companies and, maybe more importantly, improve their understanding of the Chinese market and the impact on global companies. They would also provide general analytical support for the research effort in the respective teams.

In October 2011, it was decided to hire three of these analysts as employees and terminate the outsourcing arrangement. The analysts relocated to our Shanghai office. Our view was that, to invest in the domestic Chinese market, we needed a team that could understand not only the language, but also the local context in terms of culture and government approach. Many domestic Chinese companies do not release financial reports and news in English, and management will in many cases also

communicate only in Mandarin. International financial news services have limited coverage of Chinese company news for the same reason.

While the location of our first Asian office in Shanghai was not driven by our desire to invest in China, the location was beneficial when we decided to establish an internal active management team, as it could get an on-the-ground feeling for developments in China. While we cannot set up internal teams for all markets where this understanding would be useful, we judged that China would be a big enough market to justify this investment. Subsequent results appear to validate this.

The available universe was divided into three, based on sectors. One portfolio manager was responsible for oil and gas and basic materials, one for consumer sectors and health care, and the third for industrials, technology hardware, utilities and real estate. The assets were still managed as one portfolio, but the three new hires were responsible for providing the ideas for their respective sectors.

Initially, the analysts also continued to carry out some analysis for their respective sector mandate teams, but the focus was shifted in June 2012 so that most of their time was dedicated to the China A portfolio. The fund's QFII quota was increased by 300 million dollars during the year, and the internal China A account had assets of 2.4 billion kroner at year-end.

In September 2013, another 500 million dollars was added to the fund's QFII quota. To facilitate the management of these increased assets and allow the portfolio managers to specialise more, we hired another three portfolio managers in the third quarter of 2013. The intention was for each portfolio manager to focus on fewer sectors and companies so that they could develop deeper expertise in their area. This moved the investment approach more towards the model used elsewhere in our sector management, focusing on fundamental research on a more limited number of companies that then enables larger positions to be taken. By having a narrower universe focusing on the largest companies, the portfolio managers would be able to track the companies closely, while still covering a large part of the market in terms of capitalisation. At the end of 2013, assets managed internally amounted to 5.5 billion kroner.

Starting in January 2014, the portfolio was divided into six individual portfolios with a sector focus, as well as an overlay portfolio to scale up investment ideas from the individual portfolios. The universe that the portfolio managers mostly concentrated on was also narrowed down to the top 200 companies in terms of size, down from a theoretical universe of over 1,500 companies. With 200 companies between them, each portfolio manager had a manageable number of companies to cover, permitting in-depth fundamental research. One of the new portfolio managers took responsibility for covering financials, health care was made a separate mandate, and autos were split out from consumer goods and combined with construction equipment to create a new portfolio. The three remaining portfolios consisted of oil and gas and basic materials; consumer goods and services; and industrials, technology hardware, utilities and real estate. The overlay portfolio had a benchmark that was an aggregate of the benchmarks of the six portfolios. The intention was to scale up select positions held in the underlying portfolios. Later, the portfolio would also be used to absorb assets temporarily when portfolio managers moved on. At the end of 2014, the asset size was 8.2 billion kroner.

In the second half of 2014 and first half of 2015, the Chinese stock market surged more than 100 percent in a year, helped by the overenthusiasm of retail investors. The fund was also allocated an additional 1 billion dollars in its QFII quota, taking the total to 2.5 billion dollars. To begin with, this was allocated partly to the internal mandates. In June 2015, however, the fund decided to de-risk the China A allocation, as the market started to turn. This was done by defunding equity mandates throughout June and July 2015 and investing in onshore government bonds. However, as the market started falling sharply, a large number of companies suspended their shares, and this eventually reduced our ability to sell as much as we would have wanted. A total of 200 million dollars was withdrawn from the internal mandates, leaving 11.9 billion kroner at the end of the year. As two portfolio managers departed during the year, we ended 2015 with five mandates.

Developing the mandates 2016–2020

Since the China A assets were an active allocation by the fund, the asset size available for the internal active team to manage was limited by the risk appetite for this allocation. The team therefore expanded the universe to include Chinese companies listed offshore, initially in Hong Kong and later in the US. This meant that the knowledge built up by the team through its sector coverage could be used to invest in all relevant Chinese companies in those sectors whether listed domestically or on foreign exchanges. In July 2016, we therefore set up three sector portfolios and one overlay portfolio investing in Chinese companies listed in Hong Kong. These were funded in the same way as the traditional sector mandates in developed markets, by selling from the index a set of companies in the relevant sector. At the end of 2016, the team managed 18.3 billion kroner across four portfolio managers.

2017 saw the funding of two new sector mandates. The head of the team also resigned, and we started the process of unwinding the overlay portfolio by distributing the China A assets between the individual sector portfolio managers. The intention was to have the responsibility and decision making rest with the portfolio manager who had the in-depth company knowledge. The overlay portfolio for Chinese companies listed in Hong Kong was returned to index management, reducing the assets managed actively. At the end of 2017, the team managed 18.5 billion kroner across five portfolio managers.

At the end of 2018, we established one more sector mandate, further winding down the overlay portfolio. The domestic Chinese stock market saw a significant fall during the year. Despite strong relative performance, the assets of the China team declined to 17.6 billion kroner by year-end.

In September 2018, our index provider FTSE announced that it would add China A shares as a secondary emerging market, starting in June 2019. This meant that the active allocation to China A assets would gradually be reduced as the benchmark weight increased. FTSE chose to implement the market in the global index by including its Stock Connect All Cap index. Stock Connect is a system set up in 2014 that allows foreign investors to buy shares in the domestic Chinese market without having a QFII account, with trading facilitated through the Hong Kong exchange. To take account of this, we rearranged our benchmarks in the middle of the year to align them with the benchmarks provided by the Ministry of Finance. The domestic Chinese stock market staged a strong recovery in 2019, and the team managed 23.7 billion kroner at the end of the year.

In 2020, the covid-19 situation led to a sharp fall in the Chinese equity market, but it recovered quite rapidly. We established two new offshore mandates so that all portfolio managers now have the ability to invest across all relevant exchanges where Chinese companies are listed. Some of the existing offshore mandates were also increased. The additional funding, together with strong absolute and relative performance, increased the assets the China team manage to 54 billion kroner at the end of 2020. The five portfolio managers' combined benchmark was made up of 280 companies listed across several stock exchanges.

The management

The people

Finding the right people who will make good portfolio managers is always a challenge in any setting. The reason to establish a dedicated team in China was to get people onboard who could understand the language and the local culture. Access to management in the companies we invest in is at the core of our investment approach, which we also wanted to carry over to our active management in China. However, many of the local management teams do not communicate in English. Our team is therefore made up of native Mandarin speakers who have grown up in China.

However, the portfolio managers then have to "translate" this into the fund setting, where the culture and norms are inevitably coloured by Norwegian values. To find people who could straddle these two worlds, we have looked for candidates with international experience, either from living outside China or from having worked for international companies in the past. Initially, we hired three analysts who had already worked for the fund in an outsourcing arrangement for some time, so we could start out with people we knew and who also knew the fund.

It is also important for us to find people who can take a fundamental approach to investing. The China A market has much higher retail investor participation than most other markets. Local mutual funds also tend to have a short-term focus, as heavy emphasis is placed on monthly performance league tables. There can therefore often be significant overshoots in share price performance to both the upside and the downside, creating stock-picking opportunities for fundamental investors.

The people we initially hired to join the Shanghai office in October 2011 had in practice been

working for us since August 2009 from Hong Kong. Through an outsourcing arrangement with a bank, they were hired as analysts to support a set of sector portfolio managers. The intention was to help these portfolio managers analyse some of the relevant Chinese companies, increase our understanding of how global companies were doing in China, and support the portfolio managers' overall global research effort.

When the three analysts first joined our Shanghai office, they continued to support the sector portfolio managers while also starting to work on our internal China A investments. However, it soon became clear that they would need to dedicate most of their time to the China A portfolios. These initial hires would eventually move on to other opportunities in Hong Kong and elsewhere. While the current team is focused on investing in Chinese companies, it is also important for us to utilise their knowledge in other parts of the organisation, as we discuss below.

As in many other places, there is fierce competition for talent in China. While we cannot compete by being market-leading on remuneration, our long-term approach stands out from that of many local investment managers.

The process

In emerging markets, there are inevitably challenges with ESG risks. This was a significant factor in the decision also to manage the internal portion of the allocation to China A actively. While some care can be taken in how an allocation is structured, there are limits to what we can do without knowing the companies we choose to invest in.

As mentioned above, many Chinese management teams do not communicate in English, which can limit foreign investors' ability to gain insight through management meetings. Except from for the biggest companies, most company news is also released only in Mandarin. Without the ability to read the annual report or follow regular news released by the company, it is not possible to do fundamental analysis or evaluate ESG risks. Although we are gradually starting to see the development of data services focusing on ESG risks in China, again much of the information is in Mandarin.

Companies have started to value investors like Norges Bank Investment Management as relatively stable, long-term owners, and therefore seek us out. This means our corporate access is gradually improving. Challenges remain, however. The large state-owned enterprises generally still do not offer much access to senior management.

With a team in place in our Shanghai office, we had the opportunity to increase our understanding of our investments through access to company management and local news sources, and generally build a better knowledge of the ESG risk profiles of companies and industries than would be possible from afar. Our portfolio managers then narrow down which companies they want to invest in, taking ESG risks into account. This creates a more focused, lower-risk portfolio than just investing in a broad index.

China is a key market for many global companies. It is therefore important for the sector portfolio managers to understand how their companies are doing in China, and for the China team to understand the strategy of the global companies that are competing there. We therefore encourage knowledge sharing between the two groups. This takes the form of jointly attending relevant company meetings,

discussion of investment cases, written reports and more informal communication.

We started with a very wide universe for the portfolio managers to oversee, but this has gradually been narrowed to encourage more fundamental research. While the benchmarks for the China portfolio managers contain more companies than in the traditional sector mandates due to the need to cover the whole market with five people, the research requirement to have models and meetings with the largest companies, and write up investment cases for the largest positions, is the same as for the sector mandates.

The structure

Until 2019, all China A assets were an active allocation for the fund. As the allocation increased, it became a significant risk position, given the volatility of the domestic Chinese market. An important consideration from an allocation perspective was therefore the index used to allocate assets, as this would impact both the return achieved and the approach taken by the portfolio managers.

In the fund's benchmark, we already had significant exposure to Chinese financial companies listed in Hong Kong. For reasons of diversification, it was therefore sensible to remove financials from the allocation to China A. When the internal active management of China A assets was established, the benchmark for the allocation was the FTSE China A All Cap index, excluding financials. The FTSE China A indices are based on stocks listed on the Shanghai and Shenzhen exchanges and do not adjust for foreign ownership restrictions. Active management was measured against this adjusted benchmark with the exception of six months in 2013 when an absolute return measure was used.

The financial sector was re-included in January 2014 as the quota increased, and we hired people who could manage this actively.

From the middle of 2016, the benchmark used for allocation was changed from all caps to large and mid-cap companies only. The all-cap index had approximately 2,000 constituents, and we decided that it was not realistic to invest in small-cap stocks with the active allocation, given both the inability to scale investments and a greater risk of governance and sustainability concerns in these smaller companies. The new large- and mid-cap benchmark had a more manageable 600 constituents.

From 1 January 2017, a total of 13 sub-sectors were removed from the funding benchmark due to elevated ESG risks.

Starting from 24 June 2019, the China A market was phased in by FTSE as a secondary emerging market using the FTSE China A Stock Connect All Cap index. This index is a sub-set of the full FTSE China A All Cap index, as it only includes stocks eligible for trading via the Stock Connect arrangements on the Hong Kong exchange. It also incorporates the Chinese foreign ownership limits when determining the composition of the index. As a result of this change, we chose to realign the benchmark for the full China A funding to the same index, having previously used the FTSE China A index.

One significant difference between the China A market and most other markets is our ability to participate in IPOs. Historically, the Chinese exchanges have imposed a price cap, which has meant that IPOs have tended to perform very strongly once they start trading. This understandably generates significant demand to buy into an IPO. Different groups of investors are placed into tiers of priority for allocation of

shares, with foreign investors some way down the list. On one occasion, we invested significant resources in participating in an IPO through a route expected to bring a higher chance of an allocation, but ended up being allotted the equivalent of just 700 US dollars. We later found out that one of the drivers for a car company we used in Shanghai was awarded a bigger allocation than Norges Bank. We have not participated in China A IPOs since. There is a gradual move to open up China A IPOs and make them more market-based, so we will re-evaluate as the rules change.

The allocation to China A was initially divided up between the three active portfolio managers as follows: one covering oil and gas and basic materials; one covering the consumer sectors and health care; and the third covering industrials, technology hardware, utilities and real estate. This was quite a wide span of companies, and we chose to narrow this down by hiring three more portfolio managers in 2013. When the additional portfolio managers started their portfolios in January 2014, the universe was divided into six. The focus within these sectors was also narrowed to include only the larger companies by reducing the benchmarks the portfolio managers were measured against to an aggregate of 200 companies across the six portfolio managers. This was to encourage deeper fundamental research. An overlay portfolio was also established with a benchmark that was an aggregate of the benchmarks of the six portfolios. The intention was to scale up selected positions held in the underlying portfolios. This portfolio also came to be used to absorb assets temporarily when portfolio managers moved on. Over time, the portfolio was wound down as the team gained experience and could take on more assets in the individual portfolios.

Starting from July 2016, we gradually established portfolios for Chinese companies listed in Hong Kong and the US. The benchmarks for these portfolios mirrored the sectors that the portfolio managers had in the China A portfolios. The portfolios were created to apply the knowledge built up from managing the China A portfolios across a broader asset base. The portfolios for Chinese companies listed in Hong Kong and the US have always been funded with relevant sectors from the index portfolio, which meant that setting up new portfolios here did not increase the allocation to China.

Chart 75 Net asset value. Billion kroner.

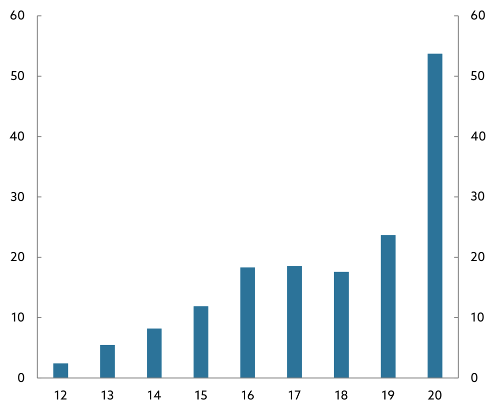


Chart 76 Number of mandates.

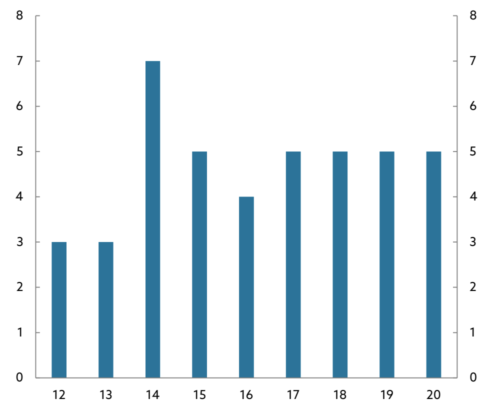


Chart 77 Market value of overweights. Billion kroner.

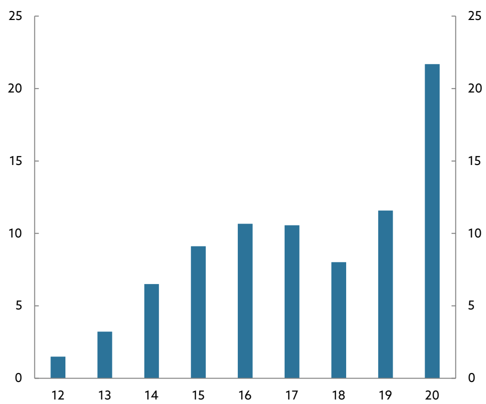


Chart 78 Contribution to the overall equity fund's active share. Percent.

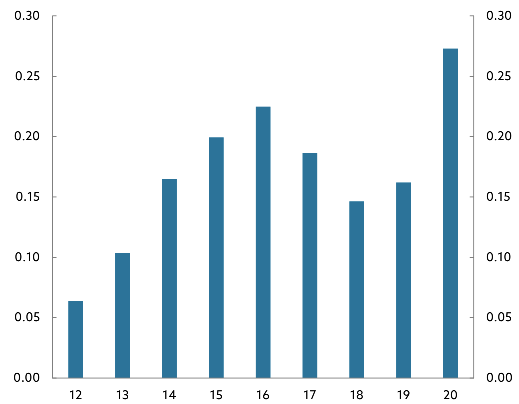


Chart 79 Percent of benchmark companies in the aggregate portfolio.

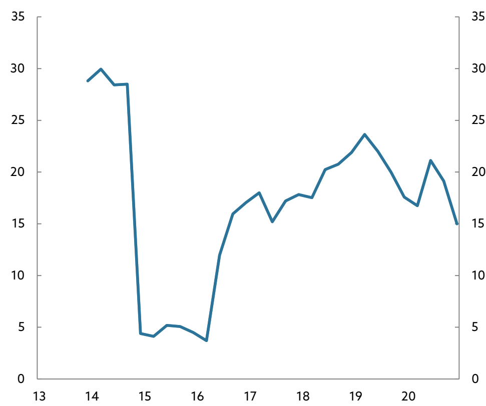


Chart 80 Median number of companies across mandates.

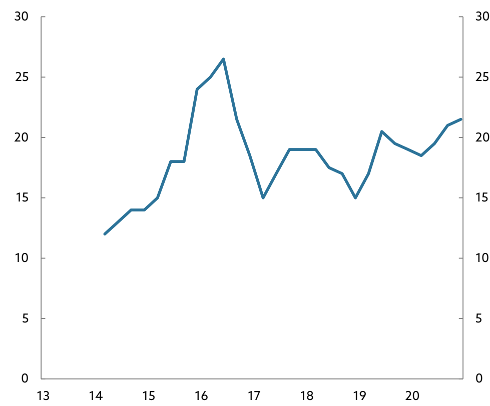


Chart 81 Active share of the aggregate portfolio. Percent.

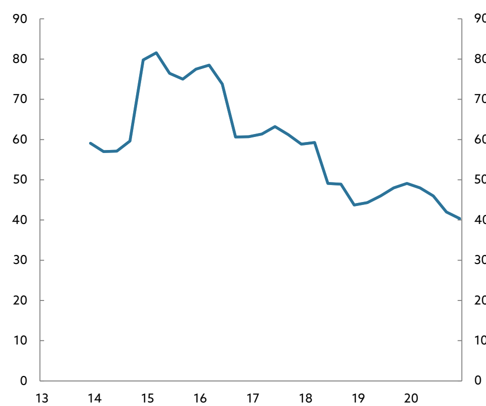
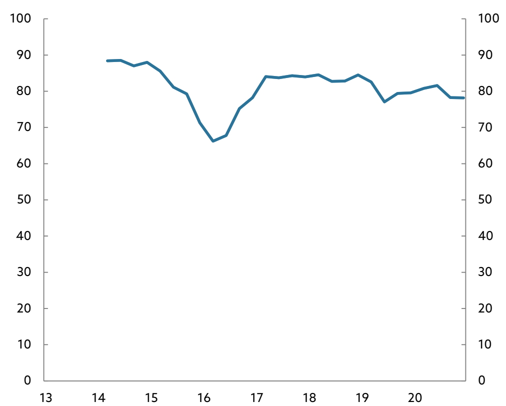


Chart 82 Average share of top ten holdings across mandates. Percent.



The returns
From inception in January 2012 to the end of December 2020, our China mandates achieved an absolute return of 20.0 percent on average per year. In comparison, the benchmark of the China mandates returned an annualised 12.6 percent in this period. The China mandates have thus produced a relative return of 7.4 percent on average per year since inception.

Cumulatively, the absolute return was 363 percent, while the benchmark return was 171 percent. The cumulative outperformance was thus 192 percent on an arithmetic basis and 71 percent on a geometric basis. The monetary value of the cumulative outperformance is 12 billion kroner, before costs and without taking any effects from reinvesting into account.

Measured over the entire period since inception, the average annual tracking error is 6.1 percent, while the information ratio is 1.0.

The relative return numbers presented here show the difference between the actual portfolio and the benchmark for our allocation to the broad China A market and thus reflect the results of stock selection in the Chinese market.

In the first subperiod from 2012 to 2015, the annualised relative return was 0.1 percent with an information ratio of 0.1. In the most recent subperiod, from January 2016 to the end of 2020, the annualised relative return was 12.2 percent with an information ratio of 1.9.

Over the full period, the internal China mandates had an asset-weighted annualised relative return of 11.2 percent. This is higher than the 7.4 percent relative return on a time-weighted basis. As mentioned above, the portfolio has done exceptionally well in the last five years. Consequently, asset-weighted returns have been better than time-weighted returns, as the value of the portfolio was relatively small in the early years.

The internal China mandates as a whole outperformed their combined benchmark in 61 percent of months between January 2012 and December 2020. In up-markets, they outperformed in 55 percent of months, and in down-markets, 72 percent of months.

The first couple of years were focused on getting to know the domestic stock market. The overall asset size, although growing, was still relatively small. In 2012, the portfolio managers had a fairly wide investment focus, and positions taken in individual companies were limited in size. This limited the overall risk, but the team still managed to outperform by 3.6 percent for the year. Risk continued to be restrained into 2013, and the team underperformed by 0.1 percent.

The internal China mandates significantly underperformed their benchmark in 2014 and 2015. The domestic Chinese stock market soared in the second half of 2014 and beginning of 2015, followed by a sharp correction. The surge was led by small-cap stocks, and despite the sharp correction in the middle of 2015, the approximately 1,400 small caps in the FTSE China A index outperformed the top 200 stocks by more than 60 percent over the two-year period. This resulted in underperformance for our portfolio, given its focus on larger stocks. As an illustration, if the funding benchmark used had been based on the mid- and large-cap index rather than the all-cap index, the portfolio would have outperformed by 5 percent over the two years rather than underperforming by the same amount.

In the years that followed, however, the underperformance from 2014 and 2015 was more than recaptured. 2017 saw a particularly strong performance by our portfolio in the China A market. This was driven especially by our selection of industrial companies with the emphasis on "New China", and by our focus on the Chinese consumer story through an overweight in food and beverages and household appliance

companies. This theme carried over into 2018 when, apart from selection in the industrial sector, investments in innovative health care companies also yielded good outperformance.

In 2019 the outperformance was more muted at 3.6 percent. This was driven by stock selection within a range of sectors with financials, technology and personal & household goods being the most important.

It has been comforting to see more recently that the investment strategy works in both falling and rising markets. In 2018, the China A market saw a sharp decline, with an equally sharp rebound from the beginning of 2019. While the portfolio will not necessarily outperform during periods with the most extreme stock market movements, it outperformed well over both full years.

2020 turned out to be another outstanding year with 20.1 percent outperformance. Investments in technology, financials and consumer companies all contributed to the strong result. The year was characterised by significant capital market activity, in terms of both IPOs and secondary issuance. This included new companies coming to market, but also some of the US-listed Chinese companies choosing to establish an additional listing in Hong Kong due to the political tension between the US and China. Participation in some of the capital market transactions that subsequently performed very well helped boost the performance for the year.

The China A and China offshore markets differ somewhat in both composition of companies and investor base. The offshore market is dominated by financials and internet-related business models, whereas the China A market is somewhat more diverse in its sector composition. The China A market is also unique in having a very high participation of retail investors, whereas in the offshore market there are more institutional investors.

While the China A portion of the portfolio has consistently outperformed every year since 2016, the China offshore portfolio has underperformed slightly in two of the five years. Thanks to its strong outperformance in two of the remaining years, however, it has still contributed a significant positive performance overall. We therefore believe that extending the strategy to cover all Chinese companies irrespective of listing venue has been beneficial.

Table 9 Annualised performance.

	2010-2015	2016-2020	Full period
Portfolio return	21.0	19.1	19.9
Benchmark return	21.1	7.0	12.5
Relative return	-0.1	12.2	7.4
Tracking error	6.2	5.7	6.1
Information ratio	-0.1	1.9	1.0

Chart 83 Cumulative relative return of the aggregate portfolio. Geometric difference in percent.

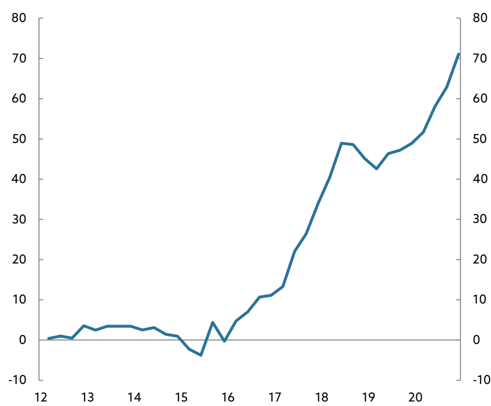


Chart 84 Cumulative relative return of the aggregate portfolio. Billion kroner.

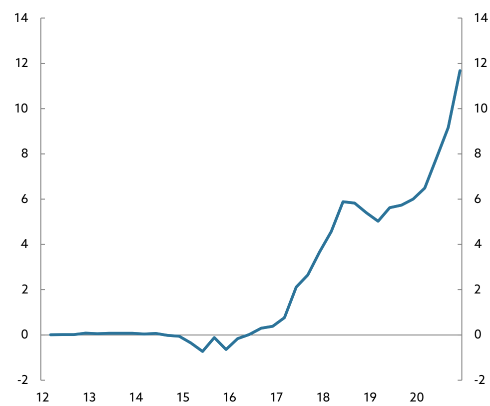


Chart 85 Annualised relative return and tracking error in percent (left-hand axis) and information ratio (right-hand axis) of the aggregate portfolio by distinct periods.

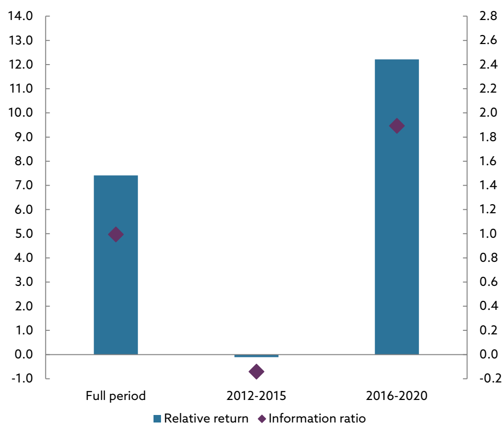
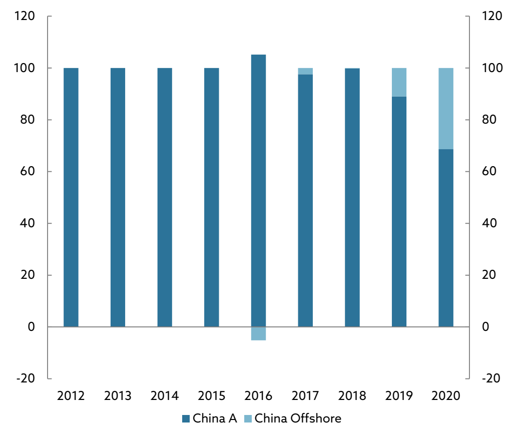


Chart 86 Share of relative performance from China A and China Offshore.



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