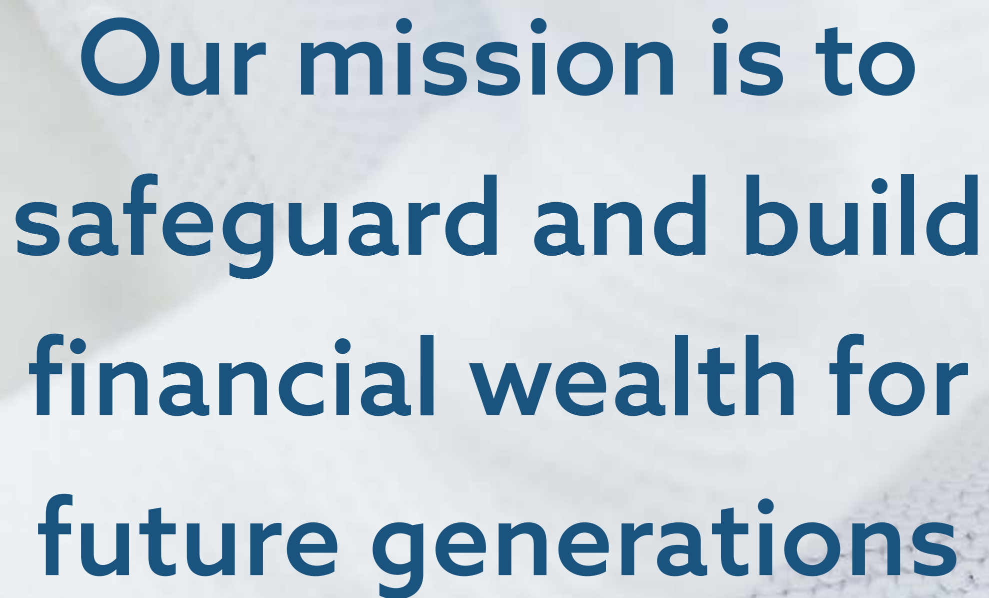
Investing with external managers

Norges Bank Investment Management


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

Investing with external managers

The 20-year history

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Safeguarding our assets

External managers' in-depth knowledge of our investments has helped safeguard our assets for 20 years.

Oslo, 16 April 2020

Yngve Slyngstad
Chief Executive Offiser,
Norges Bank
Investment Management

When Norges Bank Investment Management was set up in January 1998, we were given a mandate to start investing in equities. The first job was to get the fund invested in the equity markets, and this was executed efficiently through four external index managers. At the time, the investment strategy was still undecided, but by the end of the year, the decision had been taken to fund active managers as well. This was controversial and led to numerous discussions both within the central bank and with the Ministry of Finance officials. The first mandates awarded at the end of November 1998 needed to put in a good performance quite early if the strategy was to be continued. This review of the first 20 years of external active mandates sums up our experience – and yes, things started well.

I was fortunate to head up the team responsible for external mandates for the first decade and have worked with it ever since. This has, in many respects, been the most rewarding part of my work at Norges Bank Investment Management, and also the most enjoyable. The main lesson from seeing some hundreds of asset management firms is that there is no simple or single formula for successful investing. The nuances and complexity of investment decisions are often lost in academic discourse on what investing is about, especially when the topic of whether and how active management can succeed is raised. I hope this publication will provide some food for thought, even if it does not give any definitive answers on the best strategies and approaches.

This review describes the strategy we have pursued when selecting mandate types and offers an insight into our thinking and the lessons we have learned. A core tenet for us has been to keep our approach dynamic. It is essential to adapt processes and strategies to a changing world and to learn from experience. We have been selective about the segments of the market in which we fund managers, and we invest only where we see potential to create excess returns. We have had a number of different mandate types over the years, and the strategy has been to change the mandate structure as markets evolve.

The equity universe can be divided along various dimensions – by geography or industry, developed and emerging markets, targeted areas such as small companies, or topical directions such as environmental investing. In the early years, the choice was between a geographical or industry-based structure; only later was the fund allowed to invest in emerging markets and small companies. These latter areas are where we focus today, as these are smaller segments of the markets where specialist expertise may be most useful for the fund. They are both segments where an index strategy is not a viable option, as the index will be weak, and where corporate governance challenges are plenty.

We have always regarded the selection of external managers as an investment decision, and we have kept the internal team staffed with portfolio managers. We have always performed our own research, relying on analysing the managers' actual portfolios rather than their historical track record. We have also paid great attention to decision dynamics and to trade timing and patterns. Finally, we have blended a deep interest in the human factor – personalities, working practices, organisational set-up and so on – with assessing and contrasting extensive quantitative analytics.

We have tried to keep an open mind about what we are looking for, but some core elements have been present from the start. Fundamental company insight, encompassing analytical research, deep specialist expertise, clear and individual decision making, and a creative and distinct view of the world, has always been a part of our quest. As we have moved into small companies and emerging markets, we have increased our emphasis on local knowledge, attention to corporate governance, and the context of the marketplace. As for the investment decision makers, we have seen that they need to have a frame for the analytics, but not a rigid set-up or predetermined preference. It is essential always to be open, inquisitive, humble and willing to change your mind. It is good to know where you are headed, as long as you still take a good look around.

Since inception, external managers have played an important role in fulfilling the fund's mandate of the highest possible return after costs with moderate risk. The overall results have exceeded our expectations by a good margin. We set out with an expectation that the managers would beat the benchmark we gave them by 1 percent in the average year, and that we would end up paying them 40 percent of this excess return in fees. In the first 20 years, the excess return has been more than 2 percent annually, and we have kept four fifths of this. An excess return of 50 billion kroner from a five-person team is impressive and above our expectations.

Even more important than the strong return is the reduction in risk we have achieved. We believe that we have safeguarded our assets through the deep knowledge of our investments that our external managers have provided. We

also believe that we have significantly reduced the risk of our investments by shying away from problematic business models, challenging company strategies and weak corporate governance. Overall, the external mandate strategy has produced an excess return but, above all, lowered the fund's risk exposure.

Safeguarding our assets while fulfilling our mandate, by knowing what we are invested in, understanding market dynamics and positioning the fund for better returns and lower risk, has been our ambition. We hope this review will provide some insights into the art of investing with external managers.

From left: Erik Hilde, Yngve Slyngstad and Bengt Ove Enge with some of the applications for the first regional mandates in 1998.

Investing with external managers

Our investment strategy is dynamic and under constant development.

Over the last 20 years, we have invested with 308 external active equity managers. The types of mandates we have awarded have evolved over time – from regional and sector-specific mandates early on, to investments in emerging markets, small companies in developed markets and environment-related companies. We have constantly been looking for new investment opportunities, new ways of approaching the market and new areas where we can invest with external managers. At the same time, we have terminated mandates that did not live up to our requirements and phased out managers not fitting the strategy. At the end of 2018, we were invested with 81 managers, all of them local specialists focusing either on small companies in a specific developed market or on companies in a specific emerging market.

I have been a portfolio manager in the team since the very beginning in 1998 and have headed the external strategies team since 2010. It has been an amazing journey through volatile markets and changing opportunities. The excitement and challenges have been extraordinary, and I have truly enjoyed every part of it. I hope this book gives you a taste of that.

We seek to generate excess return by investing in the optimal portfolio of companies. Analysis of investments, portfolios and trades has been combined with meeting existing and potential new investment firms. These meetings have given us valuable insight into different ways of investing and different human characters. All the managers selected are unique, as we do not believe there is only one way to create excess return. That said, there are some commonalities in that they all do inquisitive research to make sure we are invested in the right companies, and they all focus on corporate governance as an integrated part of their analysis.

All parts of the selected investment firms are monitored and evaluated through regular meetings in their own offices, to ensure that the portfolio manager, investment team, management, compliance and operations personnel meet our requirements.

As capital markets evolve, so do the opportunities for delivering strong investment results. Which segments we assign to external managers will change with the opportunity set and is an important part of our analysis. As a consequence, the types of mandates we award have changed several times since we started, and we expect further changes in the future.

Oslo, 16 April 2020

Erik Hilde
Global Head of External Strategies,
Norges Bank Investment Management

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The history

Our strategy for investing with external managers has evolved over time in response to changes in our mandate, the fund's strategy and the market environment.

We have awarded external equity mandates to asset managers with expertise in specific areas for more than 20 years. During those years, our mandate has changed, the investment universe has expanded, and the fund has grown. The global economy and the composition of the listed companies have evolved. As a result of these factors, the focus for our external managers has changed, and the amount they manage has increased.

This review looks at our 20-year history of external active equity mandates. We define an external equity mandate as investments in companies made by an external asset manager in a segregated account in our name. The mandates clearly specify which equity markets these managers may invest in, what types of investments they may make, and what types of companies they may not invest in.

Prior to the establishment of Norges Bank Investment Management, the fund was a currency account that was managed in the same way as the central bank's currency reserves and limited to investing only in bonds. When the fund started investing in equities in January 1998, external managers had to be utilised for the first equity investments, because internal capabilities for such investments had yet to be built. We selected four external index managers. Two of the managers replicated the index, while a third manager implemented enhancement strategies and the fourth concentrated on reducing costs through more efficient trading strategies, accepting a larger deviation from the benchmark than a pure replicating portfolio.

We wanted the possibility and capability to tailor funding to internal and external portfolio managers with more specialised mandates. Therefore, a need to build internal capabilities to perform cost-efficient indexing of the portfolio soon emerged. In the early years, we also experienced that the external index managers underperformed the index. We therefore decided to phase out all the external index mandates. This is the story of our external active mandates.

The first mandates

After establishing the first four index mandates, our focus soon shifted to selecting active external managers. The fund's regional allocation shaped the way we organised the external mandates during the first few years. Back then, the mandate from the Ministry of Finance specified fixed regional weights for developed markets in the Americas, Europe and Asia-Pacific. It was therefore natural for us to organise our first external mandates in the same manner, as broad regional mandates. These mandates were issued in late 1998 and ran until 2012. The ambition was to generate excess returns by exposing the fund to the ongoing regional integration of markets and other changes in market structure. After the first three years, these regional mandates were supplemented by mandates with narrower benchmarks. The regional mandates were eventually terminated in favour of concentrating resources on emerging markets and small companies.

More specialisation

By the end of 2000, the fund had grown to 386 billion kroner. The larger size of the fund meant that we had the opportunity to award sizable mandates within relatively narrow industry sectors and single-country markets.
As all index management was now handled internally, we had achieved the flexibility to customise and award external mandates for specific industry sectors. This paved the way for the first sector mandate in 2001. The sector mandates awarded had either a global or a regional focus, depending on the manager's area of competence and the nature of the sector. Global integration was well under way, and we expected this to benefit certain companies in a number of industry sectors. We searched for managers with a high degree of specialisation who could use their industry insight to invest in the beneficiaries of this trend.

In 2001, we awarded the first small-cap mandates in Europe and Japan. The real build-up, however, did not start until 2008, after the fund's mandate had changed in June 2007 to include small companies in the benchmark index. We gradually developed an approach where we tried to find investment managers who could use in-depth fundamental research into companies and industries to construct portfolios of attractively priced companies, thereby creating value.

In 2009, we awarded our first environmental mandates, focusing on clean technologies and water. In the National Budget the year after, Norges Bank was assigned the task of establishing separate environmental mandates within the fund's existing investment universe. We later expanded the scope of these mandates to include low-emission energy, natural resource management and other environmental technologies. Specialist knowledge is of particular importance in this field, both to define the investment scope and to identify attractive companies. The ever-changing nature of this investment universe, due to constant technological progress, meant that it was an area that was particularly suitable for active investment. Deep analytical resources needed to be deployed to avoid disadvantaged companies, while uncovering industry disruptors and companies that would benefit from these developments.

Emerging opportunities

The fund has been invested in emerging equity markets since 2000, and we awarded our first external emerging markets mandates in 2005. When the fund's strategic benchmark index was expanded in 2007 to include all the countries our index provider FTSE classified as emerging markets, we gradually issued new external mandates in these markets. With a few exceptions, these were single-country mandates

where the portfolio managers were located in the same country as their mandate. We decided to invest with local managers with in-depth knowledge of specific companies to ensure that the fund was invested in companies with sustainable business practices, and preferably in attractively priced companies.

An increased focus on responsible investment has also affected the way the fund has been managed. While good corporate governance is equally important for large companies in developed markets, information on small companies and companies in emerging markets is often not easily accessible for investors who are not based in the market and lack local company knowledge. Entering these markets therefore meant that we wanted to position ourselves in a way that took this into account. We expect our specialist managers to invest in companies that deliver good returns, and at the same time not invest in companies with poor corporate governance or unsustainable business practices. We believe that companies in the latter category have a higher risk of underperforming in the longer term. When selecting external managers, we have focused on finding managers with this expertise.

Today, we see it as our role to contribute to both well-functioning markets and well-functioning companies. This means that we provide input through consultations and direct engagement to improve local market governance. We also require that our external portfolio managers subject companies to the same scrutiny and ask for the same standards of transparency and corporate governance as we do ourselves. By being a demanding investor, we expect to raise awareness around governance in emerging markets and at small companies.

A focused strategy
There are several strategies we have chosen to pursue internally rather than externally. We have chosen not to utilise external managers who follow a purely quantitative strategy to select companies. Such strategies typically employ models constructed to use a set of factors, such as value and quality. We believe that quantitative strategies are better handled internally, where we can construct and adjust the models directly, and utilise our significant asset base to implement them more efficiently. We have also chosen not to allocate to strategies that are a refinement of index management. Such strategies are handled internally.

Our experience with external active equity managers has been good. During the first 20 years, they have delivered an average annual excess return over their benchmark of 2.1 percent before fees and 1.8 percent after fees, bringing the fund extra income of 47 billion kroner after fees. External managers in emerging markets have contributed most to the excess performance, with an annual excess return of 4.2 percent before fees and 3.5 percent after fees, the environmental mandates 2.5 percent before and 2.1 percent after fees, regional managers 1.6 percent before and 1.4 percent after fees, small-cap managers 0.5 percent before and 0.0 percent after fees, and sector mandates 0.1 percent before and -0.2 percent after fees.

When presenting the return for sub-periods, we have used five-year periods. We awarded the first mandate in late 1998, and so all return calculations start from 1 January 1999.

Chart 1 Assets under management by strategy. Billion kroner

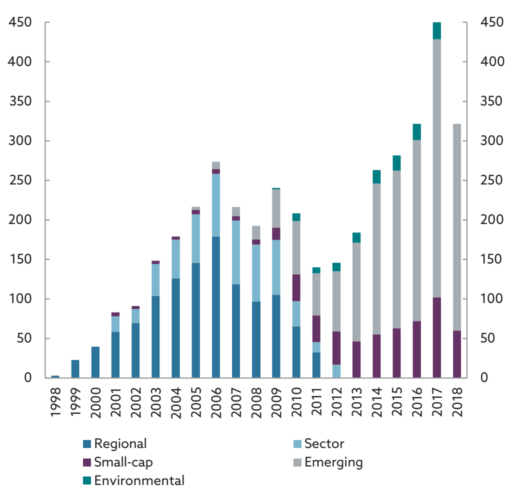


Chart 2 Distribution of assets under management. Percent of total

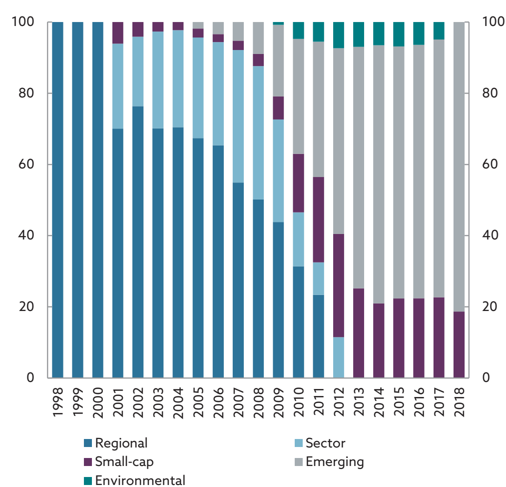


Chart 3 Number of mandates by mandate strategy

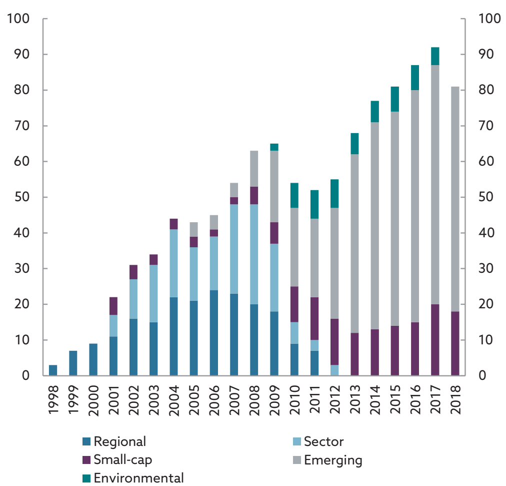


Chart 4 Distribution of number of mandates. Percent of total

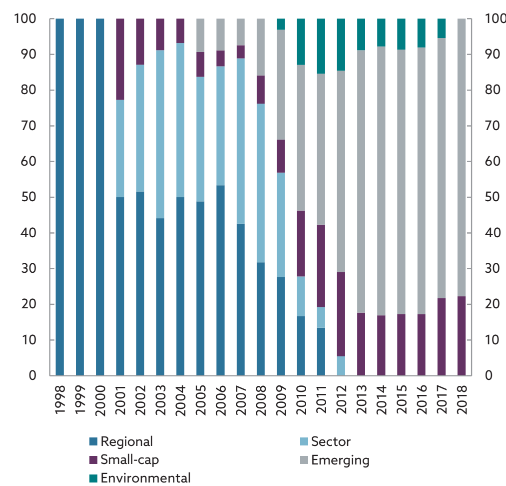


Chart 5 Percent of benchmark companies in the portfolio. Average per mandate type

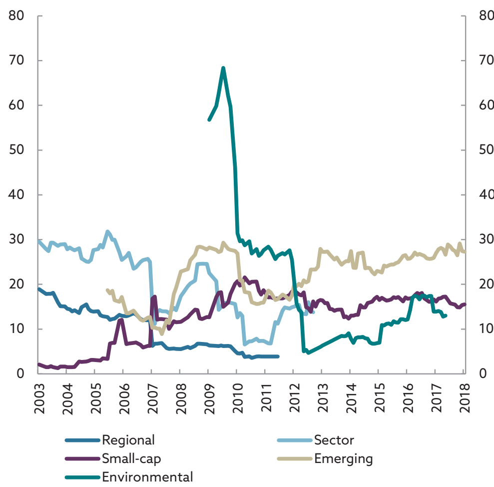


Chart 6 Average number of companies in the portfolio

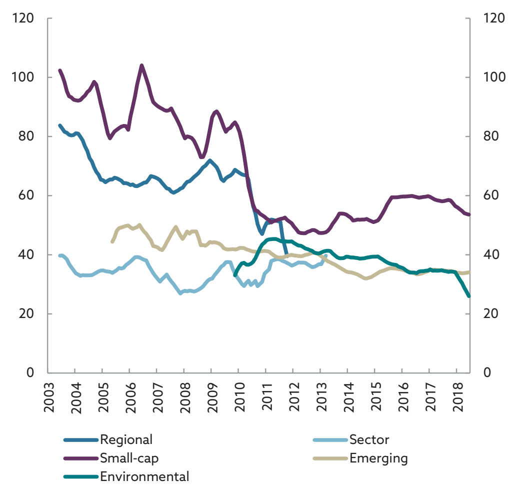


Chart 7 Active share over time, meaning degree of deviation from benchmark, as a percentage of managers' portfolios

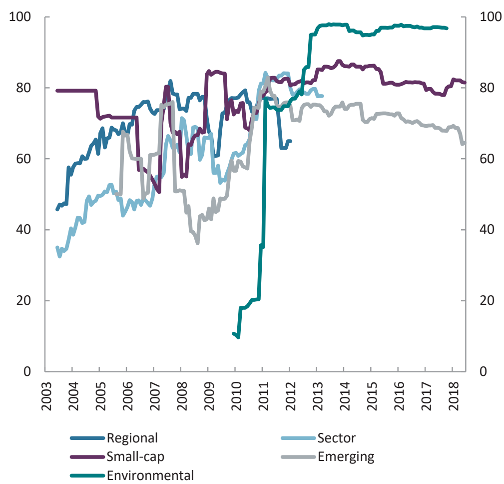


Chart 8 Average share of managers' top ten holdings. Percent

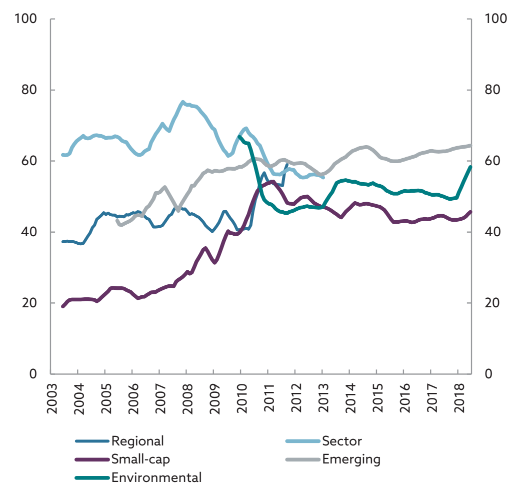


Chart 9 Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

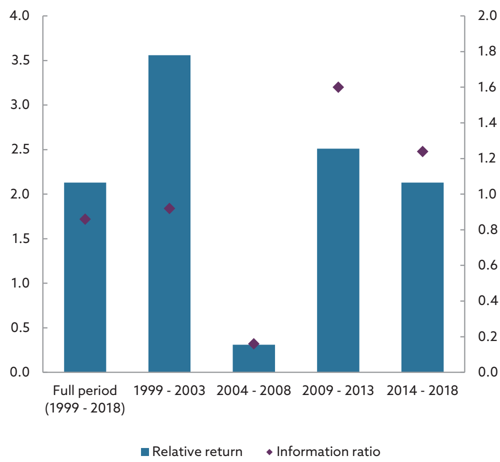


Chart 10 Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

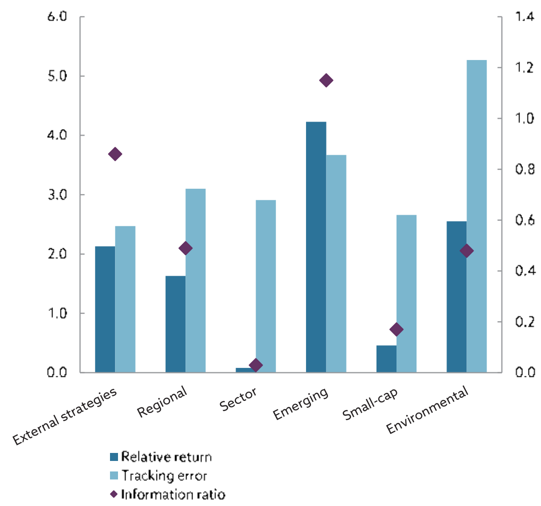


Chart 11 Annualised relative return in percent (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate

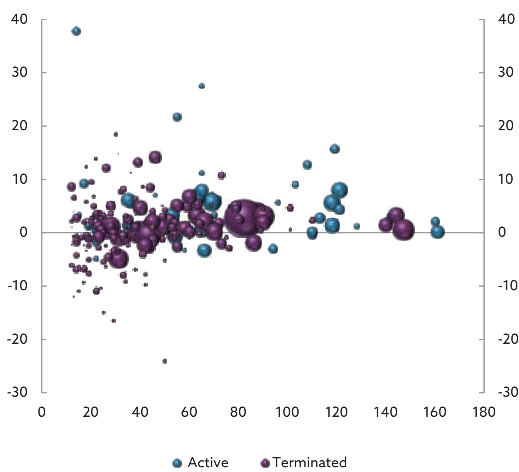
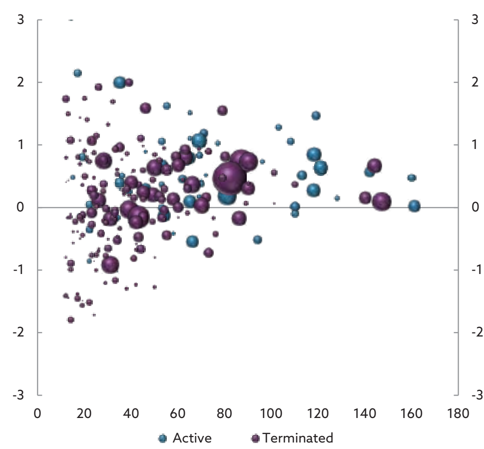


Chart 12 Annualised information ratio (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate



Regional mandates 1998-2012

The fund's regional allocation shaped the way we organised our first external managers. These managers had regional mandates, focused on in-depth company research, and used their knowledge of changes in market structure to select companies.

The regional managers mainly concentrated on finding and investing in companies set to benefit from structural economic change and disruptive innovations. These could be companies that would gain from a reduction in the importance of geographical boundaries as a result of globalisation, or from growth in demand in emerging markets, or companies particularly exposed to technological advances.

While many of the trends and developments our managers invested in were broadly known at the time, what the managers excelled at was having a better understanding of individual company sensitivities to these changes. Understanding of these sensitivities was developed through detailed fundamental research on individual companies, with a clear understanding of which economic trends each company was exposed to.

The history

Our original mandate from the Ministry of Finance specified that the equity and bond portfolios should be allocated to three regions: the Americas, Europe and Asia-Pacific. The fund's benchmark had a split of 50 percent Europe, 30 percent Americas and 20 percent Asia-Pacific. This shaped the way we organised our first external mandates. When we started evaluating regional managers, we looked for those who could manage broad geographical mandates. We defined the following regions for the mandates: Europe excluding UK, UK, Asia-Pacific excluding Japan, Japan, US and Global. The first regional mandates were awarded in November 1998.

Europe 1998-2010

When we started the search for the first European regional mandates in the autumn of 1998, the introduction of the euro was approaching rapidly. The euro had been established by provisions in the 1992 Maastricht Treaty with strict criteria for countries joining, related to inflation, interest rates and fiscal deficit thresholds. As countries strived to meet these criteria during the 1990s, economic differences across the continent diminished substantially. Our hypothesis at the time was that with a common monetary policy, a common currency and more synchronised economic cycles, we would expect to see more similar valuations across the euro area and greater co-movement in share prices. However, the introduction of the euro itself was important to fulfil this hypothesis, as it would open the door to greater cross-border investment for several large investor groups. Specifically, prior to the introduction of the euro, currency-matching rules placed explicit restrictions on the ability of insurance companies and pension funds to invest in assets dominated in foreign currencies. With the introduction of the euro, all assets in the euro area would be considered local currency for these investors, and so their markets went from domestic to regional. Partially segmented capital markets were about to be merged, and we were looking for managers focusing on Europe who would be able to capitalise on the coming convergence.

We decided to split Europe into two sets of mandates: Europe excluding UK, and UK. We

awarded a total of nine mandates in Europe excluding UK, starting with two in November 1998. We aimed to combine managers with different thinking, backgrounds and investment views. This led us to select managers based in Edinburgh, London, Amsterdam, Geneva, Oslo and Stockholm.

There were several factors that led us to establish separate UK mandates. One was that the UK decided to keep the pound as its currency. This differentiated the market from mainland Europe, with different market dynamics. It was not therefore expected to benefit from the removal of the segmentation of capital pools in the euro area. Another differentiating factor was the structure of the equity market. The ten largest companies on the London Stock Exchange were truly global in nature. Companies such as HSBC, WPP, Diageo and Glaxo Wellcome were multinationals with exposure far beyond Europe. This required a different, more global set of expertise, than the Europe excluding UK mandates, where companies exposed to Europe made up a higher share. Another factor was the size of the UK equity market, with many managers focusing solely on UK companies. We awarded our first UK mandate in November 1998. In total, we awarded five UK mandates between 1998 and 2004.

Although single-country mandates later replaced the European regional mandates, it may very well be that the renewed attention on tariffs and trade barriers makes European regional mandates relevant once again in the future.

Asia-Pacific 1999-2012

In 1999, Japan made up most of the Asia-Pacific region with roughly 80 percent of the market capitalisation of the fund's benchmark index. As with the UK, due to the size and special characteristics of the Japanese market, Japan was split from the rest of Asia-Pacific.

When we started to look at Japan, it was ten years after the peak of the market on 29 December 1989, and the Nikkei index was 40 percent below the level it had been a decade earlier. Japan had gone from a country seen as an economic miracle to a country with low growth and deflation. In the fund's annual report for 1998, we had just reported on the erosion of confidence in the Japanese economy. However, below the surface, at a company level, there were many interesting developments unfolding. Japan was still home to many global leaders with strong products and market share. At the time, a two-tier economy was developing in Japan, with significant differences between companies exposed to the domestic economy and companies exposed to the global economy and/or more technological changes. This provided an attractive opportunity. We awarded the first mandate in Japan in April 1999. In total, we awarded mandates to eight different portfolio managers during the period, all based in Tokyo.

The rest of Asia was still reeling from the Asian financial crisis, which erupted in 1997. The shine had come off the Asian Tigers story, and there was a great deal of scepticism among international investors about the potential for the Asian markets to recover their former glory. However, there were grounds for optimism in the longer term. One of the key markets in our benchmark portfolio, South Korea, had been hit hard. A series of bankruptcies of large family-controlled industrial conglomerates, known as chaebols, that had borrowed heavily in previous years to finance their investment projects, had led to problems in the financial sector. However, there were positive long-term signs, as the South Korean market was developing rapidly,

and strong global companies were starting to emerge. The IMF had stepped in with a 60 billion dollar bail-out package aimed at restoring health and stability to the economy. The market view in early 1999 was that these structural changes were bearing fruit and would improve South Korea's competitiveness.

The Asian region was home to a large portion of the world's population, and China was a sleeping giant that seemed to be waking up. In the late 1990s and early 2000s, there were major differences in how Asian asset managers outside China approached and understood the opportunities and risks China would pose for their local companies and the local stock markets. While it was unclear when China would become a major market and it had not yet joined the WTO, our judgement was that this would eventually happen and so, as a long-term fund, we needed to be prepared for it. Although investing outside mainland China, we decided to invest with asset managers that had a particularly strong understanding of China and had analysts or portfolio managers with a background from the Chinese mainland.

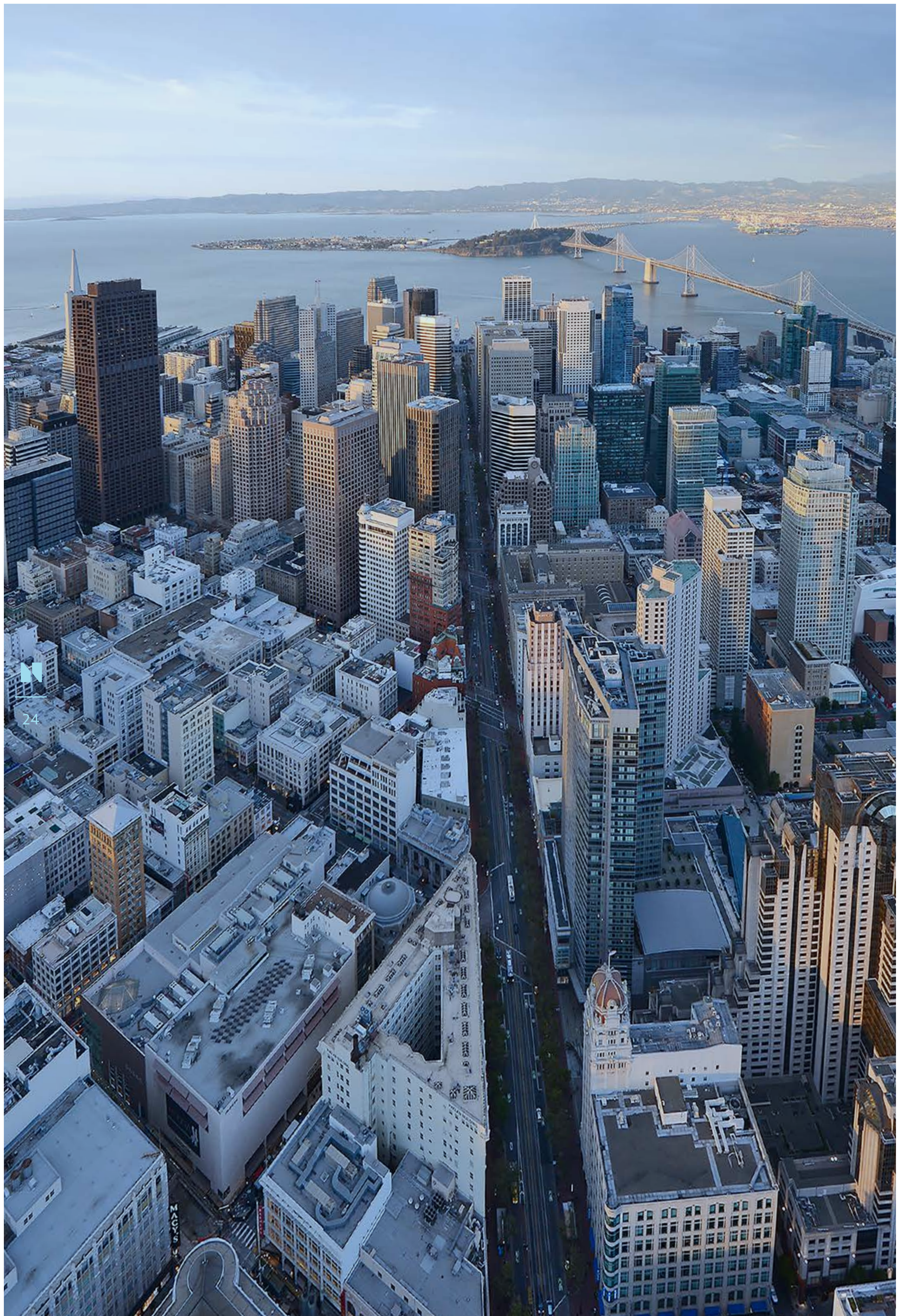
Given its abundant natural resources, one potential beneficiary of the growth happening in China was Australia. While some of Australia's exports had been hurt by the Asian financial crisis, the country was in the middle of the longest economic expansion since the 1960s, with 1999 marking nine consecutive years of growth.

We awarded the first Asia-Pacific excluding Japan mandate in April 1999. In 2005, we decided to split the region into specialist mandates. China had joined the WTO on 11 December 2001, and its entry into the global market affected the region even more profoundly than we had anticipated. South Korea, as a competitor to China in many areas, and Australia, as an exporter of raw materials to China, were split into separate mandates. We wanted people in each of these markets who understood both the medium- and long-term impacts of the changes in the region, with the emphasis on the emergence of a strong China.

US 2000-2012

The first US mandate was awarded in March 2000, coinciding with the peak of what would later be known as the dot-com bubble. Technological developments related to the Internet had fascinated investors, leading to massively increased share prices for tech companies. While many of the predictions would eventually turn out to be correct, it was not necessarily the companies listed at the time that benefited. For example, while it was predicted that we would all use the Internet to search for information instead of encyclopaedias, Google was not listed on the stock market until August 2004. The listed search companies in 1999-2000 were Lycos, Excite and Yahoo. The divergence in valuations between companies tied to the Internet and companies in other sectors was considerable at the time. This divergence rapidly collapsed as the bubble burst in early 2000, with old-world companies outperforming the plunging technology shares.

The US mandates were somewhat different to the other regional mandates. The competitive landscape for US active equity managers was well developed, and there was a large universe of managers offering products to professional institutional investors. We were conscious that approaching the US market to identify the best manager would be like looking for the proverbial needle in a haystack. Therefore, we decided to limit our focus to a few firms we knew from other parts of the world, and to managers who had a different approach to their research.



In 2003, with only two managers managing assets for us in the US, we decided to re-evaluate whether we should allocate to additional mandates in the US market. We reviewed the market and performed extensive searches across the US in 2003 and 2004. A large part of the US market was typically categorised according to company characteristics, especially growth or value. Our approach was to be agnostic to these categories, and instead try to identify managers who were not constrained to finding companies that fit a specific investment style. We searched for specialists in certain areas, such as a portfolio manager with specific expertise in restructuring cases. In 2004, following this review, we awarded nine US mandates across seven different managers. We funded managers in San Francisco, Los Angeles, Dallas, Baltimore, New York and Boston. In September 2006, we funded one Canadian manager based in Toronto.

Global 2001-2012

In the early 2000s, new communication technologies increased companies' ability to monitor supply chains over long distances. Together with trade liberalisation, this allowed multinational companies to locate manufacturing further away from headquarters and research and development facilities than had previously been possible in most industries. Capital-intensive businesses, such as manufacturing, migrated towards emerging markets where labour was inexpensive and governments offered incentives and financing. Businesses oriented towards intellectual capital clustered around areas in developed markets with a strong legacy of innovation.

The information revolution sparked by instant access to research and data from around the world led to an unprecedented technological innovation cycle with rapidly changing products and markets. Within this mega-trend, there were a multitude of trends that were changing the landscape in specific industries. For example, wireless telephony was in the process of replacing fixed-line telephony, and certain industries, such as the newspaper industry, were under threat from new competitors. The newspaper industry has gone from employing 500,000 people in the US in the year 2000 to 200,000 today.

We looked for managers who could evaluate these trends and how these trends affected a specific set of companies. The first mandate was awarded in August 2001 to a manager based in Boston who focused on sector trends and industry dynamics. In many ways, this conflicted with our core belief in specialisation, which we defined at the time as specialising in a limited universe of companies with similar underlying drivers. However, we had found a strong portfolio management team and wanted to learn more about how this mandate area would fit with other mandates. Despite strong results, our reservations about the structural nature of these mandates led us to terminate the first mandate in December 2003, and to spend more time evaluating how we should approach global mandates.

It was two years before we next awarded a global mandate in September 2005. We focused on portfolio managers who had a different form of specialisation: those with expertise in analysing wider technological, societal and economic trends. We would only hire these portfolio managers if they were surrounded by company analysts who could conduct deep research into how these wider trends would affect the performance of individual companies. The importance of understanding major economic trends and their beneficiaries was therefore even greater with the global mandates

than with the regional mandates. The analysts and portfolio managers would first analyse broader changes and then concentrate on a small subset of the overall investment universe to determine which companies might benefit from these trends. Our global portfolio managers did not aim to cover all industries or companies worldwide, but instead concentrated on in-depth research on a few potential portfolio companies. It is important to note that while these managers looked at companies around the globe, they did not necessarily invest in multinational companies with a global footprint. More often, the managers looked at regional or local companies benefiting from wider economic trends.

In total, we funded eight global mandates between 2001 and 2010. In order to avoid the same trends being repeated in all of the portfolios, we selected managers with distinctly different investment approaches. For example, one portfolio manager had an affinity for finding beneficiaries of technological disruptions and changing consumer demand, and as a result selected fast-growing companies. Another manager had a contrarian approach and looked for companies that had performed poorly in the market recently, but stood to benefit from positive medium-term demand in the relevant industry macrocycles.

The challenges

The main challenges when we started looking for regional managers were that we needed to develop our own knowledge and strategy for selecting and combining the right managers. We needed to build internal tools to organise information and analyse the portfolios, as well as a structure with separate accounts for each mandate. We also needed to develop investment guidelines to ensure optimal investments, and restrictions to avoid unwarranted risks.

Competence

As we set up the organisation to manage the fund, it was acknowledged that external managers would play an important role for us in fulfilling our mandate to generate the highest possible return after costs. We therefore evaluated the use of consultants to assist us in the selection of external managers. Several of them had an in-depth knowledge of the asset manager market and advised numerous pension funds and other institutions. We, however, were in a different position to many of their usual clients. The fund was expected to grow quite rapidly. We expected the investment universe to be expanded over time to cover more countries and smaller companies. We also expected a great deal of attention to be paid to what we invested in and how, which external managers we invested with, and the excess return on our investments before and after costs. It was therefore decided that evaluating and selecting external managers should be one of the core competences of our organisation.

To be able to make the best investment decision, it was paramount to know every aspect of each manager's portfolio, the investment philosophy and the analysis behind the manager's investments, portfolio construction and trading. This meant that it was essential to meet all personnel in the firm influencing investment

decisions and the environment in which the decisions were made.

To gain this knowledge, it was important to acquire our own first-hand information on each of the potential external managers. This information would to a large extent be based on analysis of the manager's current portfolio and changes in the portfolio over time, as well as on-site discussions with all relevant personnel in the firm. This meant that we had to develop a thorough and differentiated approach to learn about the asset managers in the relevant market and build an understanding of which managers had relevant insight into the particular drivers in that market.

The structure was furthermore set up such that it would not be an investment committee at Norges Bank that decided which manager would be awarded a mandate, but an individual portfolio manager. One important outcome of this decision was that employing external managers would be an investment decision where the internal portfolio manager needed to identify with the external manager's challenges and understand the difficulties faced in making the right investment decision. The internal portfolio managers were therefore given an investment mandate for investing in listed companies in addition to the investment mandate for investing with external managers. This contributed both to additional knowledge about the market dynamics in the different regions and to a live experience of the challenges related to in-depth research on companies and how to construct a portfolio.

Information

It was important to find a way to structure our approach, without making investing with external managers a rigid process. When we started searching for active managers in 1998, our first task was to develop a questionnaire to obtain the information needed for the initial overview and analysis. With a questionnaire of about 130 questions, we went public with our request for proposals. We received around 300 replies from managers in Europe, Asia-Pacific and the US. The questionnaire was used as a key source of information for structuring our evaluation of the asset managers and coming up with a long-list of potential managers to visit.

Even though the questionnaire was extensive, it became clear to us during the first round of meetings that the information provided by the questionnaire was not as useful as we had expected. Factual information, such as ownership and organisation structure, assets under management in different strategies, team members' CVs and current portfolios, gave us a good indication of which firms we should analyse further. Answers related to the investment process, however, were often not representative of how investment teams would describe their own approach when we met them. Also, the team members highlighted in the replies would often be different to the ones the portfolio managers would see as critical to their investment decisions.

Furthermore, the portfolio managers named in the replies as responsible for the mandate would typically be based on the firm's own assumption of who would be most likely to win the mandate. Their assumption was usually based on the provision of a diversified product, such as portfolios in different regions run by multiple portfolio managers. This was not attractive for us, as we wanted to diversify the mandates ourselves, and were looking for a product that was an optimal fit in combination with other managers. Early on, we used the analogy that we were not aiming to buy a car, but components that we could put together ourselves to give us the car we were looking for.

Based on the lessons learned from the first rounds of meetings, we changed our approach. It was clear to us that we needed full access to all portfolio managers at each firm, as well as their actual portfolios, to find the specific product we were looking for.

We therefore asked the asset managers to open up their investment organisation, meaning that we would meet all the portfolio managers and relevant analysts of the candidate firms, and not only the proposed portfolio manager. This could mean interviewing 10-20 portfolio managers and analysts at each investment firm. In many cases, we decided to allocate assets to portfolio managers who were not originally proposed to us. In some cases, we also decided to allocate funds to portfolio managers who had not until then been individually responsible for managing portfolios.

By funding portfolio managers early in their career, we built loyalty with specific individuals. This loyalty was further strengthened when we increased our assets with them at times when they were making losses, in the expectation that they would generate an excess return going forward. Loyalty was important for us, as we needed to be treated fairly, even though our portfolio was small compared to those of their other clients. Loyalty was key when we were competing with other clients for additional capacity and when we had requests that differed from those of other clients.

With access to all personnel, we would also use the firm's analysts as a source of information on which portfolio managers asked the right questions at the right time and were interested in discussing relevant topics, company meetings, new analysis and changes in the portfolio. This allowed us to triangulate the best portfolio managers within each firm.

With access to all portfolios, our approach was to analyse not only the current and historical portfolios of the suggested portfolio manager, but also those of the other portfolio managers. This meant that we had the information available to analyse investments across the organisation. We used historical portfolios and information in the questionnaire as a basis for discussions with each of the portfolio managers and other relevant investment personnel on changes to the portfolio, missed opportunities, company meetings, additional desktop analysis conducted, and internal team discussions. All these interviews were conducted at the manager's offices, preferably at the manager's desk, and always with only one portfolio manager or analyst present at the same time. The purpose of this was to build a deep understanding of the portfolio managers' knowledge and decision-making approach. Information from these discussions was compared and contrasted with information from their colleagues and analysts.

We also looked for additional sources of information to gain a better understanding of which managers to approach for a mandate. Databases were evaluated, but these often lacked the information we were searching for. Investment banks were contacted, but few would give us valuable information during the fund's infancy. The main sources of information were therefore the portfolio managers themselves, who would tell us about who they thought were their most important competitors, and the firm's analysts, who would give us information on the firm's portfolio managers.

Analysis

To evaluate the information gathered, we needed to structure our findings and build internal tools so that we could analyse the changing portfolios.

For the shortlisted managers, we constructed a manager evaluation form with almost 150 categories to structure our findings. We used this form to generate expectations for future excess returns after costs and expected volatility, and to identify key organisational characteristics of the asset manager.

During selection we conducted extensive analysis of the latest available and historical portfolios, including sector deviation, liquidity profile and exposure to market opportunities. We also analysed portfolio concentration, exposure to small companies and differences between portfolios at the same firm and across the firms. The aim was to find the portfolio manager who would generate a sustainable excess return by thinking differently to his or her competitors.

We reviewed quantitative three-factor models based on historical returns to try to identify managers with attractive characteristics. However, we did not find these models to be particularly useful. The tool that proved useful to us was a software solution where we could download the portfolios and analyse the companies, portfolio construction and trade execution. Furthermore, several tools were developed internally using the actual portfolios as the information source.

After the manager had been selected and funded, we had a live portfolio with daily trading data. These live data were analysed to gain a better picture of the aggregate exposure of all the managers, whether they found different opportunities at different times, and whether their combined investments were optimal. We would model the return, exposure and correlations to provide us with a portfolio framework for taking the funding decisions. In our view, it is only when a mandate is funded and actual records of trading and positions can be analysed, that we are able to determine whether we still have confidence in our selection, and how the portfolio diversifies the combined portfolio of external mandates.

Originally, we employed an external trading analytics consultant. This provided us with estimates of transaction costs and trading efficiency for the various portfolios. However, more importantly, we used the trading analytics in combination with holdings analysis to evaluate investment decision making. Later, more customised analytical tools were developed internally. This ensured both transparency on portfolio managers' decision making and improved understanding of their portfolio construction.

Risk management is an integral part of portfolio management in terms of both the individual investment and the overall portfolio. We therefore ensured that the portfolio managers had a detailed insight into every single company in their portfolio and could explain the rationale for transactions. We also required that the portfolio managers could describe how the weights of individual positions were determined. We conducted this analysis through a combination of on-site interviews, questionnaires and separate analysis of holdings and transactions.

Every year, all existing managers were re-selected. Outside the scheduled annual due diligence meetings, we would have regular update meetings with portfolio managers, and organisational changes or specific events could trigger a new full review at any point in the year. For example, if the information ratio, meaning relative return/relative volatility, fell below -1.5 since inception, an immediate due diligence

process was initiated to determine whether or not to re-select the manager.

Segregated accounts

To be able to perform all the necessary analysis on a continuous basis, we decided that each mandate should be held in a separate account in the name of Norges Bank. This means that we have never transferred any assets out of Norges Bank's custody account, but simply given the managers the right to buy and sell shares in a separate account in Norges Bank's name. This has three important implications:

First, we have daily insight into the trading activity in each of the external portfolios. We have built custom reports and proprietary analytics tools to monitor these portfolios, providing daily information on how much the managers have bought or sold of each stock, at what price, with which counterparty and so on. This gives us valuable knowledge for evaluating each of the managers and how they manage our assets. It also provides useful insights into each portfolio's market and liquidity characteristics, as well as the investments and performance of the aggregate portfolio of external managers.

Second, whenever a manager is terminated, we simply cancel the trading authorisation and transfer the assets to another internal portfolio for transition. This means that all mandates are terminated with immediate effect, helping safeguard the assets in the best possible way. No manager will be able to place orders after termination. It also means that all transition activity after termination is managed internally, based on thorough analysis of market exposure, liquidity and market impact costs.

Third, the assets never leave our hands. If something happens to the manager, or in the market, there can be no discussions or disagreement about ownership. It is our account, and we own the assets. This clearly limits the counterparty risk vis-à-vis the external manager.

Guidelines

A set of investment guidelines formed part of the investment management agreement with each manager and set out the mandate's objective, the investment universe and various restrictions. The guidelines contained restrictions on which companies and instruments the managers could not invest in, maximum cash level and certain prohibited exposures. We had no restrictions on concentration, maximum weight of companies, sector deviation in the portfolio, or investment style.

In the beginning, we specified that each mandate's objective was to "outperform the benchmark in a consistent and controlled manner", and we further specified an annual excess return objective for each mandate and an expectation for relative volatility. As we gained experience, we gradually changed our approach, and the guidelines were used to ensure that the managers invested more in the companies where they had highest conviction.

In conversations with the managers, we signalled that we would expect, and accept, periods of underperformance. In 2004, the investment guidelines were updated with a wider band for market exposure, which enabled the portfolio managers to vary investments more, depending on market opportunities. In 2009, we updated the guidelines for the regional mandates by specifying that we would expect "significant deviation from the benchmark". In 2011, relative volatility was removed completely from the investment guidelines and replaced

with a measure to ensure that the managers focused on creating an optimal and concentrated portfolio. Staying close to the benchmark to reduce relative volatility increases the possibility of being invested in companies we do not want to be invested in. The managers should therefore seek to improve their portfolios irrespective of the benchmark weights.

Managers were not allowed to buy futures, forward currency contracts and other derivatives, or to leverage the portfolio (borrow money to invest in companies). We applied a cash limit so that the manager was fully invested in equities with no more than 5 percent of the portfolio in cash for transaction purposes. The investment guidelines also listed all companies that were excluded from the universe due to environmental, social or governance issues.

The fund's mandate limits the total percentage of a company's outstanding shares that the fund is permitted to hold. To deal with the possibility of different portfolio managers buying the same stock, and thereby exceeding this ownership limit, we originally put in place ownership limits of 0.3 percent per mandate. However, as the fund and the mandates grew, this limit became a practical limitation for the portfolio managers, restricting their investment opportunities, particularly in small companies. At the end of 1999, several managers held a high number of companies with ownership close to the limit, and it was likely that the weights of many companies were lower than the portfolio managers would otherwise have wanted. Therefore, the limit imposed on each manager was gradually relaxed, first to 0.75 percent in 2001, then to 2 percent in 2006, and finally to 3 percent in 2008. This followed the changes in the ownership limit in the fund's mandate; from 1 percent in 1998 to 3 percent in 2000, 5 percent in 2006 and 10 percent in 2008. Through daily monitoring of holdings across the portfolios, we were able to ensure that we would not breach the aggregate ownership limit in our mandate, and we could instruct managers to sell stocks if required.

Combining mandates

Our main concern was the combination of mandates over time, not each mandate in isolation or at a specific point in time. It was important for us to ensure that we did not invest with similar types of managers, but created a portfolio that generated an excess return through market cycles.

To manage the combined portfolio, we looked at a variety of metrics. We considered how the mandates diversified each other over time, and analysed how the combined investments in the aggregate portfolio would change when adding or reducing individual mandates. For this purpose, we evaluated the changes in traditional measures such as volatility, beta, factor exposure, overlap and sector exposure. Our main concern, however, was to gain an understanding of the investments behind these numbers.

Often, portfolios may look diversified and may even act diversified under normal market conditions. In periods of market stress, however, their true diversification may turn out to be significantly lower than estimated. We wanted to understand the investments and exposure in adverse market environments by analysing the way different portfolio managers made their investment decisions. We sought to build a portfolio which was diversified in terms of decision-making approach. This diversity could be due to different investment philosophies, the different backgrounds and experience of the portfolio managers, different environments for making investment decisions, or even being

located away from the common news flow of the main financial centres.

When constructing the regional portfolios, we controlled the regional exposure by reducing the internal index portfolio in each country or region by the value of the mandate. This ensured that there were no changes in the overall country or regional exposure and no change in currency exposure (for example, to the Japanese yen) for the fund as a whole. As a consequence of this regional neutralisation, regional allocation was never an outcome in our combination of mandates.

We would also monitor the combined cash exposure in the portfolios. Typically, managers hold up to 5 percent cash for transaction purposes. In the early years, we would equitise this combined cash exposure by buying futures to keep the equity exposure at 100 percent.

Funding and transition

During the first two years, we funded around 11 billion kroner in Europe and 4 billion kroner in Asia-Pacific. During the first five years, from 1998 to 2002, we continued to expand searches in Europe and Asia-Pacific and funded around 54 billion kroner in Europe and 28 billion kroner in Asia-Pacific. Funding for the American and global mandates was lower in this period at around 10 and 6 billion kroner respectively, as we spent longer finding the right strategy design in these areas.

In Europe and Asia-Pacific, following the initial funding during the first five years, we started to experience some capacity constraints, primarily due to liquidity and diversification. Combining too many portfolio managers may create a portfolio that is too close to the market portfolio. Therefore, after 2003, the funding to these regions slowed down significantly, and we allocated significantly more to the American mandates where we did not experience the same capacity constraints. In 2004 and 2005, we allocated an additional 32 billion kroner to mandates in the Americas.

Funding and defunding were based on our assumption of expected excess return for each of the managers and analysis of the aggregate portfolio. More assets would be transferred to managers where our expectations for future excess return increased, or where our combined investments would be improved. Managers were subjected to even deeper scrutiny after periods with a higher or lower return than expected. We often assumed that returns would recover after periods of underperformance and so we increased funding – and we reduced funding after periods with a better performance than expected.

When funding a manager, we would ask for a list of companies that they wanted to be funded with. Similarly, when reducing the funding to a manager, we would ask for a list of the companies he or she would sell, and transfer these to an internal transition account. If the mandate was terminated, we would transfer the whole portfolio to the internal account. This funding and defunding in kind was done in order to reduce costs, as well as to have full oversight of transition activity. Our internal trading desk had been building a specific capability in such transition activity, as its main task was to invest continuous inflows, while the external managers' trading desks were in most cases focused on building capability in single-stock trading.

The return
The regional mandates delivered an annual absolute return of 4.0 percent before fees from 1999 to 2012. They delivered an annualised excess return of 1.6 percent before fees and 1.4 percent after fees, measured against their combined benchmark for the same period. The information ratio for the mandates combined was 0.5 for the excess return before fees.

Each of the regions delivered a positive annualised excess return. The global mandates had an excess return of 5.0 percent, the Asia-Pacific mandates 1.7 percent, the European mandates 1.4 percent and the American mandates 0.4 percent. The corresponding information ratios for the combined mandates were 0.8, 0.3, 0.4, 0.4 and 0.1. The annualised relative returns were furthermore positive in each five-year sub-period: 3.8 percent in 1999-2003, 0.4 percent in 2004-2008 and 0.4 percent in 2009-2012. All of these numbers are before fees.

Strong start and good continuation
The first two years were particularly good for the European managers, with a 12.4 percent excess return before fees in 1999 and 5.0 percent in 2000. The European managers paid attention to trends, such as the integration of European markets into a single currency zone and the growth in technology and demand for resources. They positioned portfolios to benefit from these trends by having exposure to companies with the greatest sensitivity to them while at the same time trading at reasonable valuations. The European regional mandates outperformed in seven years and underperformed in five.

For the Asia-Pacific mandates, 1999 was a very strong year. The two-tier economy that unfolded in Japan in the late 1990s was a huge factor in the excess return. The managers owned fewer companies with exposure to the older and domestic economy, and concentrated investments in companies with exposure to global growth and advanced technology. Stock selection and sector allocation in the Asia-Pacific portfolios generated a 43 percent excess return in 1999 and showed how selecting the right companies and avoiding overpriced ones could be very beneficial in unusual market environments. In the two following years, Asia-Pacific underperformed the benchmark by 4.5 and 2.1 percent respectively before fees, but regained the lost ground with excess returns of 2.4 and 6.3 percent in the two years after that.

We funded the first US mandate at the peak of the technology bubble in March 2000. We terminated this mandate little more than a year later, in May 2001. The annualised return during this period was -19.4 percent for the portfolio, versus -15.5 percent for the benchmark, resulting in an annualised underperformance of 3.9 percent. During the period June 2001 to November 2002, there were no American regional mandates while we made plans for how we would approach the region. In November 2002, we started up a new programme for the American regional mandates. The performance of the American regional mandates from November 2002 until the final termination in January 2012 was an annualised excess return of 1.1 percent before fees and an information ratio of 0.3.

Out of the 57 regional mandates, 34 outperformed the benchmark, and 23 underperformed. The average annualised excess return was 3.3 percent before fees for the mandates that outperformed, and -3.1 percent for the mandates that underperformed.

In Europe, there were eight mandates that outperformed the benchmark and eight that

underperformed. However, several of the underperforming mandates were only slightly behind the benchmark, while many of the outperforming mandates were significantly ahead of the benchmark. Seven mandates delivered an annualised excess return above 2.0 percent, seven mandates delivered between +2.0 and -2.0 percent, and two delivered returns below -2.0 percent. Negative returns were not seen as a reason to terminate a mandate, but the managers running these were obviously put under more scrutiny. We were proactive in terminating new approaches where our original thesis was not verified. The average duration of the mandates that underperformed was three years, versus five years for the outperforming mandates.

In the Asia-Pacific region, we had nine outperforming mandates and five underperforming mandates. It should be noted that one of our longest-serving portfolio managers in Japan is present in this count three times, as we had mandates with him as a portfolio manager at three different firms – our mandate followed him as he changed employer. In addition, he continued to manage a Japan small-cap mandate following the end of the regional mandates. All in all, he managed assets for the fund for almost the whole of the first 20 years. Counting this manager as one mandate would lead to eight mandates outperforming and four underperforming. The average lifespan of the underperforming mandates was two years, versus six years for the outperforming mandates.

Table 1 Regional mandates. Number of outperforming and underperforming mandates

		Mandate relative performance	
Number of mandates	Total	Positive	Negative
Europe	**16**	**8**	**8**
Equal-weighted return, percent	0.9	4.1	-2.4
Asia-Pacific	**14**	**9**	**5**
Equal-weighted return, percent	0.2	1.9	-2.9
America	**19**	**10**	**9**
Equal-weighted return, percent	-0.8	2.1	-4.0
Global	**8**	**7**	**1**
Equal-weighted return, percent	5.2	6.1	-1.3
Total	**57**	**34**	**23**
Equal-weighted return, percent	0.7	3.3	-3.1

Better performance in rising markets

The regional managers as a whole outperformed in 55 percent of the months they were funded. In up-markets, they outperformed in 64 percent of months, and in down-markets, 44 percent of months. The average return in up-market months was 3.6 percent, while the benchmark return was 3.2 percent. In down-market months, the average portfolio return was -3.5 percent, while the benchmark return was -3.4 percent. The effect of having higher returns than the market in up-market months and lower returns in down-market months characterised most of the regional mandates except for the global managers. The global managers delivered slightly higher returns than the market in up-market months but substantially lower losses in down-market months. This is what generated the strong returns for the global managers over time.

Table 2 Regional mandates. Share of months with positive relative return. Percent

Share of months with positive return	Months outperforming	Portfolio return	Benchmark return
Europe	**58**		
Up-market months	64	3.9	3.8
Down-market months	49	-4.1	-4.2
Asia-Pacific	**51**		
Up-market months	64	4.3	3.7
Down-market months	34	-4.4	-4.1
Americas	**55**		
Up-market months	62	3.3	3.1
Down-market months	44	-4.2	-4.1
Global	**55**		
Up-market months	47	3.5	3.2
Down-market months	68	-3.8	-4.3
Total	**55**		
Up-market months	64	3.6	3.2
Down-market months	44	-3.5	-3.4

Adding value through funding

After a portfolio manager was funded, we had daily transaction data and thereby better information available to verify or falsify the initial selection. Accordingly, we would increase or decrease the funding as our expectations for future excess return changed. One way we measured whether our different fundings were successful over time was to analyse the difference between the time-weighted excess return and an equal-weighted excess return.

The equal-weighted return is the return we obtain by giving equal weight to each manager at any point in time. As the equal-weighted excess return of 0.7 percent was lower than the time-weighted excess return of 1.6 percent for the regional managers as a whole, the funding/ defunding decisions had a strong positive impact.

Large changes in the value of assets under management during the investment period distort the traditional time-weighted numbers, as the returns in periods with low assets under management count the same as those when assets under management are high. This can be compensated for by looking at the asset-weighted return, meaning the portfolio return weighted by monthly assets under management. For the regional managers as a whole, the asset-weighted return was lower than the time-weighted return, which means that we did better in times with lower assets under management. This is to a large extent explained by good performance in 1999 when the fund was small and the asset level invested with external managers was low.

The picture is different for the American managers. The amount of assets invested in the Americas varied greatly over the period, starting with a very low amount early on and growing to approximately 65 billion kroner at their peak. During the period June 2001 to November 2002, there were no mandates at all. The annualised asset-weighted excess return was 1.3 percent, higher than the time-weighted return of 0.4 percent, indicating that the strongest returns were generated when asset levels were high.

Table 3 Regional mandates. Time-, asset- and equal-weighted relative returns. Percent

Relative return	Time-weighted	Asset-weighted	Equal-weighted
Europe	1.6	0.3	0.9
Asia-Pacific	1.8	1.0	0.2
Americas	0.4	1.3	-0.8
Global	4.1	3.9	5.2
Total	**1.6**	**0,9**	**0.7**

Managing through crisis

The US regional managers served us well during the global financial crisis. They outperformed by 1.8 percent before fees in 2007, matched the benchmark in 2008 and outperformed by 15.4 percent in 2009. The managers managed the portfolio actively through the financial crisis. Going into the crisis, they were, on aggregate, positioned with more investments in higher-quality companies. During the crisis, most of the managers considered the spread in valuations between high- and low-quality companies to be too narrow. They were also concerned that some earnings expectations were too high and that the financial sector was too leveraged. This turned out to be correct. Once the equity markets sold off, they re-positioned the portfolio and benefited from the re-rating in the market in 2009. The return in 2009 was particularly helpful, as this was a period of underperformance in the European regional mandates.

The absolute performance of the European managers was 23.8 percent before fees in 2009, while the benchmark returned 32.5 percent. Relative to the benchmark, 2009 was thus a difficult year for the European portfolio. The managers had been well positioned for the financial crisis in 2008, but did not reposition the portfolio when the market turned in 2009. During this time, we had started to focus more on specialist managers, and our exposure in Europe was concentrated between three managers, of whom the one with the largest mandate underperformed the benchmark. Several of his positions were more exposed to persistent difficulties. Across all the external mandates, we had a relative return of -0.3 percent in 2008 and 3.0 percent in 2009.

Diversification among managers

Diversification between regions led to more consistent results, as different regions delivered positive and negative returns at different times. In the period from 1999 to 2012, at least one strategy had a negative performance in ten out of 14 calendar years. However, due to the positive effects of diversification, the combined regional mandates had a negative performance in only three out of the 14 years.

An example of diversification was in 2008, when underperformance in Asia-Pacific was mitigated by the performance of the European and US mandates. In 2009, the picture was partially reversed, with underperformance in the European mandates, and outperformance in the US and Asia-Pacific mandates.

The global mandates behaved differently to the regional mandates. They paid particular attention to detecting major economic trends and then positioning in the companies that stood to benefit from these trends. This diversification of the strategy paid off in 2006, when the global managers delivered an excess return of 14.9 percent in a year when several of the regional managers struggled.

We focused on finding managers with a different perspective. One aspect of this was to look for managers located in different geographical locations. In retrospect, what we found is that we had greater success with our London-based asset managers than with managers in other locations in Europe. With the American managers, the largest positive contribution to the return came from managers located in Los Angeles and Philadelphia-Baltimore, while managers in Boston and New York detracted. Geographical diversification paid off in the US, but not in Europe.

Our regional managers, independent of region, had around 60 companies in their portfolios. We prefer the managers not to add companies to the portfolio for diversification reasons, as it lowers the overall expected return profile and increases the probability of being invested in companies without knowing all the details.

Until 2007, external managers were invested in between 15 and 20 percent of the companies in the European and Asia-Pacific benchmarks. In 2007, small companies were included in both the fund's and the managers' benchmarks, and the share of benchmark companies included in the portfolios dropped to between 10 and 15 percent.

Active share increased over time, with around 50 percent in Europe and Asia-Pacific and around 70 percent in the American mandates. An active share of 70 percent means that only 30 percent of the weight of that portfolio overlaps with the benchmark. As our expectation is that our portfolio managers outperform the market through better analysis and portfolio construction than their competitors, we want to leverage this by having more concentrated investments.

Managers running more concentrated portfolios, whether measured as sector concentration, active share or weight of largest overweights, fared better than more diversified managers.

Chart 13 Regional mandates. Market value since inception. Billion kroner

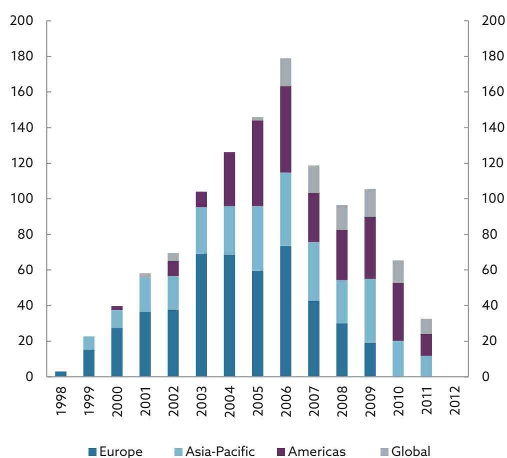


Chart 14 Regional mandates. Number of mandates by region

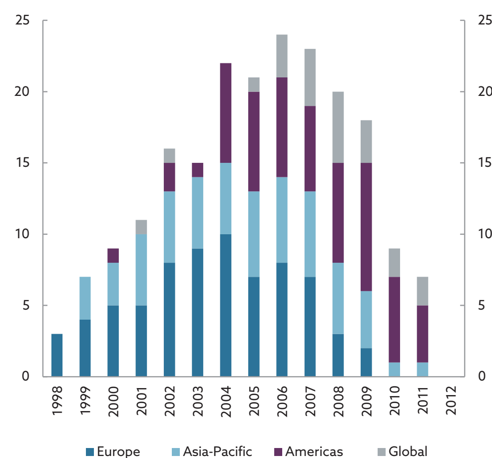


Chart 15 Regional mandates. Percentage of benchmark companies in the portfolio

Chart 16 Regional mandates. Average number of companies in the portfolio

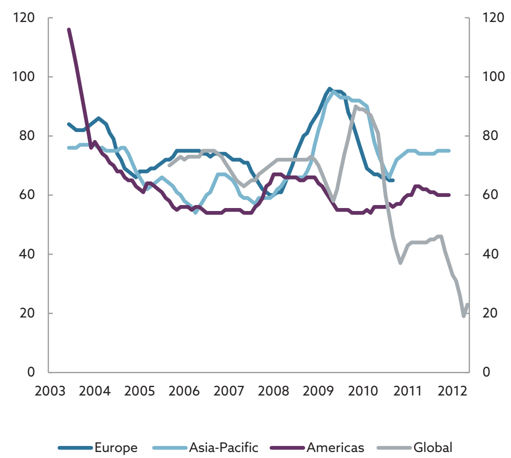


Chart 17 Regional mandates. Active share over time, meaning degree of deviation from benchmark, as percentage of managers' portfolios

Chart 18 Regional mandates. Average share of managers' top ten holdings. Percent

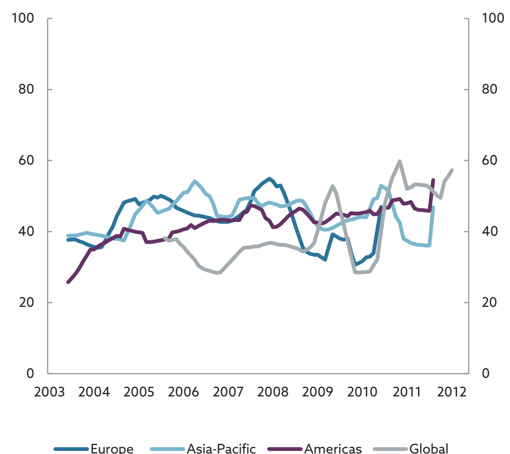


Chart 19 Regional mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

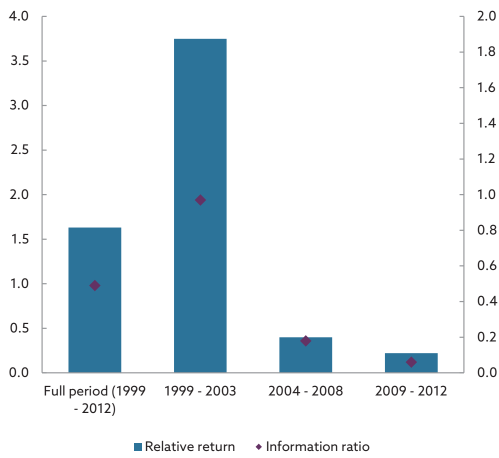


Chart 20 Regional mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

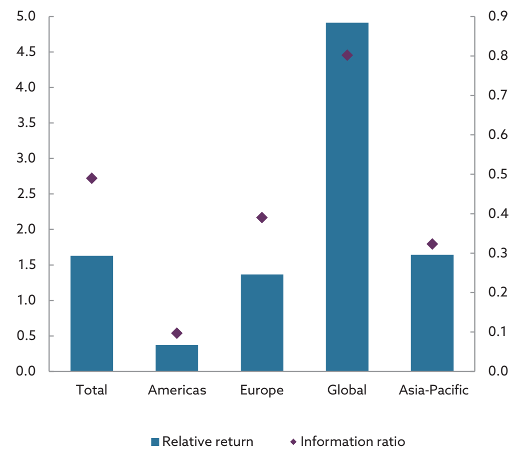


Chart 21 Regional mandates. Annualised relative return in percent (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate

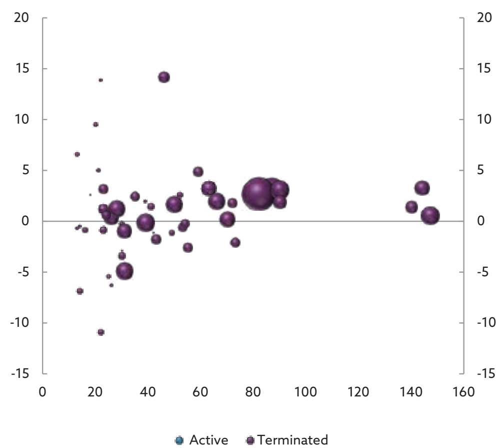
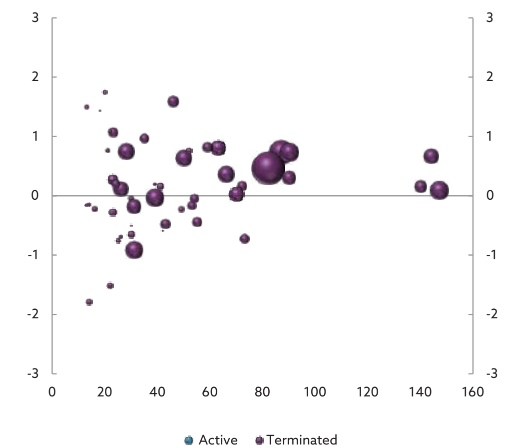
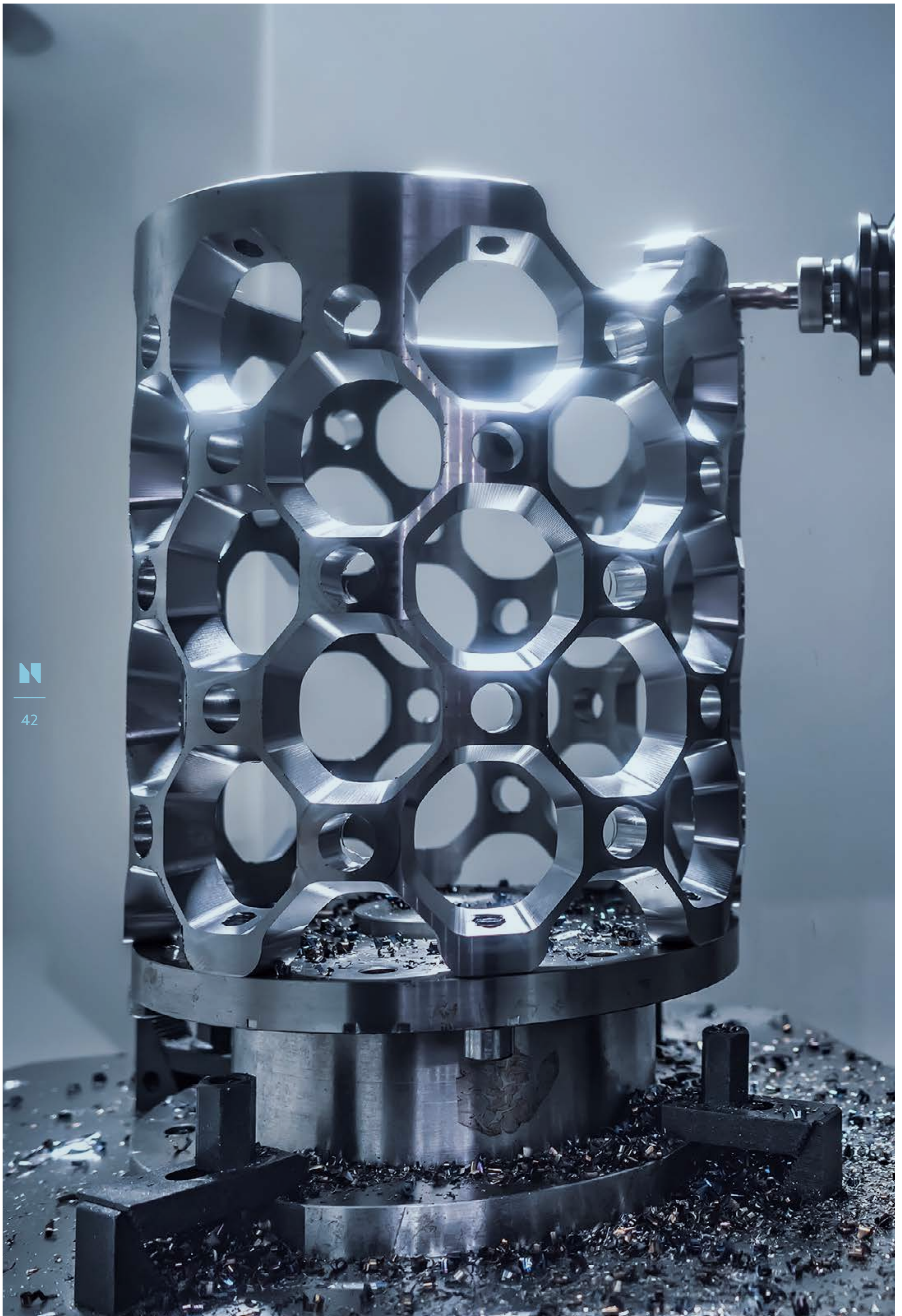


Chart 22 Regional mandates. Annualised information ratio (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate





Sector mandates 2001-2013

Our sector mandates had a focus on specific industry sectors, either global or regional. The portfolio managers used industry expertise and knowledge of the global competitive landscape and supply chains to select a portfolio of companies.

In the early 2000s, we observed that companies in developed markets were becoming increasingly industry-specialised with growing global reach as a result of globalisation. Regional companies with large market shares were increasingly going head to head on the global stage. This required them to become even more competitive with strong specialisation.

The initial concept behind the sector mandates was that industry expertise and knowledge of the global competitive landscape and supply chains in specific industries would bring insight beyond that of generalist investors. Global industry vertical supply chains were springing up and accelerated with free trade agreements, China was expected to join the WTO, and outsourcing was becoming prevalent. Providers of related consulting, IT and professional services followed suit by setting up internal sector-specialised groups to serve these global companies. Our hypothesis was that sector managers who had in-depth knowledge about the sector effects of these trends, and were organised accordingly, would be able to generate excess return.

The history

The first mandates 2000-2002

In 2000, we started looking for sector specialists. Global integration was well under way, and we expected this to benefit selected companies in a range of sectors. We searched for managers who could use deep industry insight to identify the beneficiaries of these trends. It was also expected that differences in the pricing of similar companies across markets would be something the managers could use to create excess return. Great attention was paid to avoiding investments in companies that would not manage the transition to a more global competitive environment.

The first mandates were awarded in 2001, and we had six mandates by the end of the year. Over time, this grew to a peak of 28 mandates. 40 percent of the mandates we had over the lifetime of the sector strategy were regional mandates, while 60 percent were global. The first mandates consisted of two global technology mandates, one global health care mandate, one global financial mandate, and two regional financial mandates. The initial mandates covered broad market sectors with multiple sub-sectors and hundreds of potential companies to invest in. Depending on the specific industry and the relevant market drivers, we would consider whether regional or global sector mandates were most relevant. The new mandates were allocated total funding of 20 billion kroner.

There were few institutional asset owners allocating to sector mandates when we initiated our search and awarded the first mandates. There were therefore few institutional sector products available. Some retail-oriented mutual funds existed, but not many, and sector-oriented hedge funds were still in their infancy. We utilised existing managers and boutiques where possible, but there was a shortage of these. We were, however, willing to fund new mandates or strategies. Therefore, we tried to use large organisations with large analyst teams, where we would focus our resources on searching for analysts with the required skill set and personal traits that would enable them to become successful portfolio managers. We were often looking for young analysts who would be able to develop into specialist portfolio managers. Six new sector mandates in four sectors were awarded in 2002. These sectors were energy, utilities, basic materials and industrials. All in all, the year saw additional funding of 10 billion kroner allocated to new and existing mandates, defunding of 3 billion kroner and one termination.

Initial experience was positive, but more importantly, we learned several lessons to help us further evolve our selection methods. It became clear that conflicts of interests, bureaucracy and a focus on asset gathering over investment returns could be a problem with large financial conglomerates.

One lesson from the early years was that portfolio managers must be given the autonomy to make decisions. This was particularly a problem for one asset manager with a dividend discount model where the portfolio managers became secondary to the overall model and the narrow base-case inputs to the model dictated which companies could be added to the portfolio or not. This limited the role of informed judgement. The lessons learned led to some turnover in the mandates. While one of the financial mandates and the health care mandate lasted for nine years, another financial mandate was terminated after 11 months and the three other original mandates after around two years.

The evolving mandates 2003-2007

Over time, the investment universe for each mandate was tailored to fit the knowledge of the portfolio manager. The universe was narrowed to include only sub-sectors the managers were skilled in, and we would exclude countries where the portfolio manager had limited coverage. We did not want managers covering broader parts of the markets, but portfolio managers who had a narrow scope and performed in-depth research. In retrospect, the increasingly narrow scope of the universe led us to select portfolio managers who were good analysts but not necessarily good portfolio managers, and this ultimately limited the performance of the strategy.

2003 saw the first funding of a mandate with a small boutique single-sector asset management firm. We observed that the hierarchical costs were lower, the communication lines shorter, the commitment and motivation of the employees higher, and the alignment of interests better than with the larger platform managers. Over time and different strategies, our belief in small specialist asset management firms has further solidified.

From 2003 to 2006, we made adjustments based on our experience from the first couple of years, awarding 30 new mandates and terminating 26. With the addition of telecommunications, automotive, consumer staples, media, transportation, retail and consumer discretionary mandates, we had at this stage achieved a broad coverage of market sectors. At the end of 2006, we had 15 external

sector mandates with total assets of 79 billion kroner. Nine out of 15 sector mandates were global, while the rest were regionally focused. Five of the 15 mandates were run by small asset management firms.

Certain sectors were easier to cover with mandates run by existing portfolio managers, such as technology, health care, financials and utilities, while others, such as industrials and consumer sectors, required us to create new portfolios run by analysts who had not previously managed these types of portfolios.

Several of the mandates we had at the end of 2006 were managed by teams of analysts who ran sub-portions of the portfolios within one mandate. In 2007, we decided to split these sub-portions into independent mandates, to incentivise each of the portfolio managers and provide better insight into the decision making in each of the portfolios. Four broad sector mandates were split into 15 mandates covering narrower segments of the market. The health care mandate funded in the first year, for example, was split into four mandates: pharmaceuticals, biotech, medical technologies and health care services. Steps were taken to ensure that this would not lead to increased fees. In this process, the funding for the mandates was increased by 2 billion kroner. At the end of 2007, there were 25 mandates with 81 billion kroner in assets. This represented the peak year for sector mandates.

The financial crisis 2008-2012

What began as a crisis in the US subprime mortgage market in 2007 evolved into a crisis for the entire global financial system in 2008. The world's worst financial crisis since the 1930s, it was a result of excessive leverage built up over a number of years combined with insufficient equity capital in the banking system. Scenarios that had previously been considered farfetched, such as large bank failures leading to economic collapse, were suddenly realistic outcomes. Only massive bailouts of banks combined with fiscal and monetary easing prevented the crisis from spinning even further out of control. While a collapse of the economic system was prevented, the world slid into recession.

During this crisis, the advantages of having organised our mandates as segregated accounts became even clearer. Since we had daily holding and transaction data from our accounts, we could track and analyse the portfolios without significant delay. While some managers proactively managed the portfolios and changed their exposure as new information became available, others were less capable of adapting to a rapidly changing world. Both managers with previous experience of managing portfolios and analysts who managed portfolios underperformed in 2008. However, the more experienced portfolio managers proactively changed their portfolios after the rescue packages were released to increase exposure to companies that had become attractively priced during the crisis, while the analysts maintained a very defensive positioning. As a result, when global markets recovered in 2009, the experienced portfolio managers more than recovered their relative losses from 2008, while the analysts did not.

Subsequent detailed analysis of trades and positioning led us to make substantial changes to our portfolio of sector managers. There was significant restructuring in the asset management industry, and several of our portfolio managers left the industry, causing us to terminate the mandates. Many of the portfolios we had segregated out to cover sub-sectors were terminated, as were many mandates we had funded in the three to five years prior to the crisis.

In total, 19 mandates were terminated and 13 new mandates were awarded during 2008 and 2009. In line with the fund's strategy of being a countercyclical investor, we funded managers during a period when many other investors withdrew cash from the market. On 6 March 2009, the Dow Jones hit what would later turn out to be its lowest level. In the same month, we allocated managers an extra 44 billion kroner.

The financial crisis gave us insights into how the portfolios were managed through extreme market movements. There were sectors where we found that portfolio managers experienced difficulties whereas our specialists had done well, and vice versa. The key part of our analysis of what had happened was not related to returns, but to how portfolio managers altered the portfolio as new information emerged and pricing changed. After evaluating the disappointing results that the sector mandates had during the financial crisis, we decided to reverse the original decision to have a broad set of sector mandates covering most market segments, and focused the sector mandates on health care and basic materials. In 2010 and 2011, we terminated all mandates that fell outside these two areas. A total of 85 billion kroner was defunded in 2010, and at the end of the year we had six mandates with 32 billion kroner in assets. In 2011, 18 billion kroner was defunded, and at the end of the year we had 13 billion kroner in three sector mandates in health care and basic materials. There were a total of 17 terminations and only one new mandate during 2010 and 2011.

With a growing number of emerging markets and small-company mandates and limitations on the overall fee budget, we decided to discontinue the external sector strategies. We continued with a limited set of sector mandates over the next two years and terminated the final sector mandate in September 2013.

The experience gained from the sector mandates was important for structuring our later investments in environment-related mandates, which in many ways can be seen as a continuation of the mandates specialising in industry-specific segments.

The challenges

The main challenges when we selected sector managers were in finding industry specialists with deep sector knowledge who could become portfolio managers. We had to understand their incentives and roles within the firm, and to make sure the portfolio managers used their insights not to allocate investments between industries, but to invest in companies they knew well.

Industry specialists

We assumed the sector mandates would use a different set of information sources to our regional mandates, and actively sought managers who did exactly that. By basing investments on different information and constructing portfolios from different universes to the existing mandates, we wanted to improve the fund's diversification and return profile. It was determined early on that we should try to award mandates in all industry sectors to have a well-rounded portfolio of mandates.

The challenges in finding good sector managers were different to those in finding good regional managers. The regional managers often had years of practice in utilising internal resources such as regional sector analysts and usually had substantial portfolio construction experience. We were now looking for individuals who themselves were the industry specialists with long and deep expertise within a limited segment of the market. Our preference was to find portfolio managers running existing sector-specific products. There were some portfolio managers focusing on products for retail clients in a limited number of sectors, such as technology and utilities, but otherwise there were almost no existing institutional products. Our initial approach was therefore to select strong analysts in solid research organisations who we believed had the skill set to become portfolio managers for us.

We would assess the analysts' responsibilities and their knowledge of the specific sectors or industries. We looked for analysts with an in-depth knowledge of the companies, and we avoided analysts with broader coverage responsibilities. We customised benchmarks to fit the skill set of the manager, and we created narrow sector definitions where applicable. The information sources used by the analysts were scrutinised in detail. Our preference was for analysts and portfolio managers who drew on differentiated information sources. We were looking for investment professionals who, for example, networked with and monitored suppliers and customers of the company, did proprietary survey work, proactively engaged with mid-level management or had a better knowledge of regulators and unions that could impact a company's prospects.

For some types of mandates, an especially high degree of industry expertise was required. One example is health care, where the portfolio management teams had a direct medical background and PhDs in medical-related fields in addition to training as financial analysts. Similarly, in the basic materials sector, our managers employed geologists who were better able to evaluate mine potential than generalist market participants. Due to their expertise, the geologists also had better dialogues with the industry than the generalists did.

Roles and incentives

To be able to find the right portfolio managers, we had to understand their role within the firm, their position in the team and how they were incentivised. We reviewed how the firm ensured that their views were challenged by other team members and that they had sufficient time to manage a portfolio for us.

We emphasised understanding the role of an analyst within the organisation. The characteristics of a buy-side sector analyst are in many ways different to those of a portfolio manager. An analyst is responsible for management contact and financial forecasts for a list of companies under coverage. In addition, the analyst needs to promote the best ideas to portfolio managers. This involves preparing investment cases and presenting them to internal audiences. We would therefore address the status of analysts in the organisation, and to what extent they would have control over their own agenda. We would, for example, look at whether an analyst was required to cover and write analyses on a set of companies determined by the portfolio managers, or if they were mandated to determine themselves where to concentrate. The ability to concentrate time, resources and energy on a few promising potential investments was viewed as a strength, while spreading resources thinly across a large number of investments to do maintenance research was viewed as a likely disadvantage.

Team structure, incentives and career opportunities were also considered to be important. For example, if analysts were considered junior to portfolio managers, with less financial potential in terms of pay, this would be a negative indicator, as it could mean that analysts would be more focused on gaining promotion by telling their superiors what they wanted to hear. We would evaluate this, for example, by reviewing the proportion of analysts versus portfolio managers who had ownership stakes in the asset management firm. We would avoid firms where the team structure was such that the analysts rotated between sectors as a training ground to become generalists. Our underlying hypothesis was that a dedicated sector analyst would obtain a deeper knowledge of his or her sector than more general analysts who either covered many sectors or rotated through different sectors and therefore spent less time covering each one.

Given that analysts may be the sole experts within an organisation, we attached importance to firm dynamics to understand how they were challenged by other team members, including generalist portfolio managers. Even the best analysts need sparring partners, and these should preferably be within the same firm.

In our due diligence interviews, we paid particular attention to whether sufficient time was allocated to managing our portfolio compared to other responsibilities. The managers of our portfolios, and in particular the ones who retained their analyst responsibilities, had many responsibilities beyond managing the portfolios we assigned them. For example, many of the firms we met had onerous requirements for filing information in large databases, customising research to multiple investment teams with different investment strategies, and updating generalist portfolio managers on quarterly results and any minor developments. These and many other administrative requirements meant spending time on tasks that aided neither analysis work nor portfolio construction, but were simply there to fulfil some requirement created by other functions. We viewed these extra tasks as unfavourable, as they took the analysts' attention away from analysis of the companies they invested in on our behalf.

Investing within an industry

One of the key challenges was to ensure that the managers we hired used their insight to invest in a company at the right price to create long-term value. We wanted managers who used their in-depth industry-specific knowledge to invest in companies they knew very well, and not managers who allocated investments between different industries. In addition, we designed portfolio analytics tools to evaluate managers' contribution to the overall portfolio.

One of the reasons why there were few sector products available when we started with sector mandates, and few institutional clients awarded mandates of this kind, was that it would require institutional investors to have a sector view and a directional position in the sector. We avoided this through our funding method, where the sector weights in the internal index portfolio were adjusted to take into account the funding of specific sectors. This was uncommon in 2001, as few others had the opportunity to hire external managers and then continuously proactively adjust an internal index portfolio. This is easier today for many managers after the emergence of sector ETFs and other index products. The aim of our funding method was to ensure that the sector exposure of the overall fund was unchanged by our funding of sector mandates. The impact of the various allocations to each sector mandate simply led to changes in the proportion of the sectors that were managed actively against a tailored benchmark.

While our funding method ensured that we did not have unintended sector over- or underweights, there were several other aspects to take into consideration when designing a portfolio of external managers, such as correlations between managers, country exposure and beta. We therefore designed analytics tools to evaluate managers' contribution to the overall portfolio at various levels of funding. Our tools used company-level daily data from our portfolios which we received from our custodian and equivalent index composition data. By focusing on the actual companies we owned, we obtained a better overall picture of our exposure than if we had concentrated only on the aggregated valuation and performance numbers. Any company we invested in had exposure to the market beta and other risk-factor loadings, in addition to pure idiosyncratic risk. Some of these could be diversified away through careful portfolio management. We therefore closely monitored exposure to systematic risk.

With the sector portfolios, we were always concerned about the market beta exposure we would get from the combination of the mandates. On average, the beta to the market was 1.03 for the sector mandates over their lifetime, but at an individual mandate level there were a broad range of betas. We adjusted the overall beta in the portfolio by regulating the size of the individual mandates. Given the focus on specific sectors and the average beta above 1, we did not equitise the cash in the portfolios.

In our monitoring, we also spent significant time analysing the similarities between the companies we owned and holdings in actively managed funds and hedge funds. The similarities to hedge fund portfolios were higher for our sector portfolios than for other areas where we have had mandates. This was particularly true for portfolios run by analysts.

The return

The sector mandates had an annual return of 4.4 percent before fees over their lifespan from 2001 to 2013. They delivered an annualised excess return of 0.1 percent before fees and -0.2 percent after fees, measured against their benchmark. The information ratio for the mandates combined was 0.0 for the excess return before fees.

The relative returns were positive in two out of three five-year sub-periods, with a 0.4 percent annualised return before fees in 2001-2003, -0.2 percent in 2004-2008 and 0.2 percent in 2009-2013. The corresponding information ratios were 0.4, -0.1 and 0.0.

The highest excess return was in basic materials with an annualised excess return of 1.4 percent before fees, closely followed by the health care sector with an annualised excess return of 1.3 percent. It was our experience that some sectors were more easily understood by the generalist investors that dominated the markets. The sectors that generalists struggled to fully comprehend were the ones where we found that specialist knowledge was the most useful. The industrial sector mandates had the lowest relative return at -4.3 percent.

Mixed results

Our experience with the sector managers was mixed, with only 51 percent of the mandates outperforming their benchmark. The average annualised excess return of the mandates that outperformed was 3.1 percent, while the mandates that underperformed delivered a -4.7 percent annualised excess return.

Table 4 Sector mandates. Number of outperforming and underperforming mandates

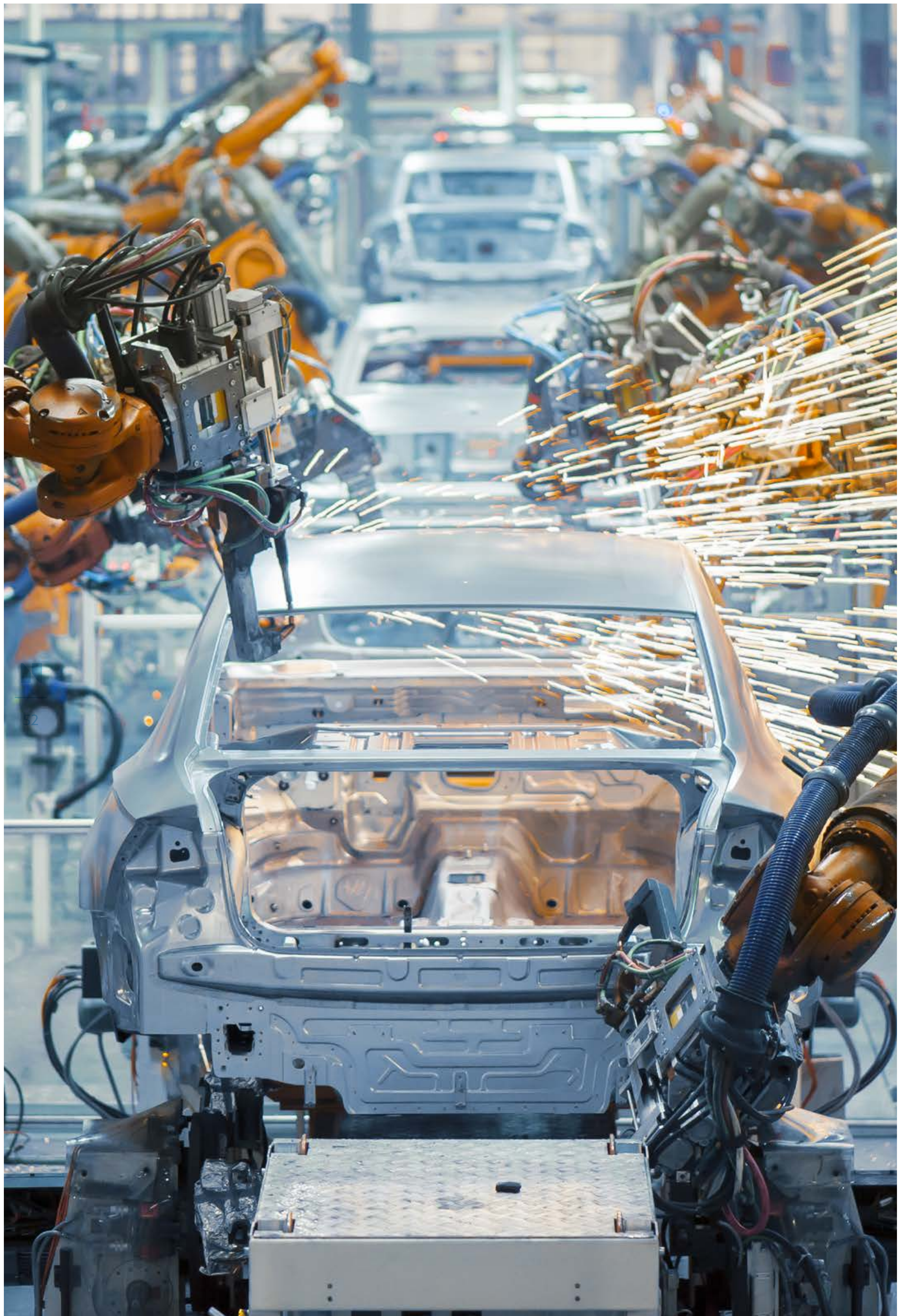
		Mandate relative performance	
Number of mandates	Total	Positive	Negative
Total	**71**	**36**	**35**
Equal-weighted return, percent	-0.7	3.1	-4.7

Table 5 Sector mandates. Share of months with positive relative return. Percent

Share of months with positive return	Months outperforming	Portfolio return	Benchmark return
Total	**52**		
Up-market months	55	2.9	2.8
Down-market months	48	-3.9	-3.7

Table 6 Sector mandates. Time-, asset- and equal-weighted relative returns. Percent

Relative return	Time-weighted	Asset-weighted	Equal-weighted
Total	**0.1**	**0.4**	**-0.7**



The sector mandates outperformed the benchmark in 52 percent of months. If we evaluate performance in positive and negative months for the combined benchmark for the sector mandates, the portfolio outperformed in 55 percent of up-market months and 48 percent of down-market months. The average performance in up-market months was 2.9 percent, versus a benchmark performance of 2.8 percent. The average portfolio performance in down-market months was -3.9 percent, versus -3.7 percent for the benchmark

Large changes in the value of assets under management during the investment period distort the traditional time-weighted numbers. In the case of the sector mandates, we started out with lower levels of assets. In addition, towards the end of the sector mandates, there were only a few mandates remaining. At the end of November 2010, we had only six mandates left. With just a few mandates remaining, where each of them had a high relative volatility, the time-weighted percentage return series were dramatically affected, even though there was a limited monetary impact due to low assets. Over the lifespan of the mandates, the sector mandates had an asset-weighted annual excess return of 0.4 percent. This is higher than the traditional time-weighted return and indicates that returns were higher in the months when we had more assets invested.

An equal-weighted portfolio, where an equal amount is allocated to each sector manager each month, had a return of -0.7 percent. This compares with a time-weighted return of 0.1 percent, indicating that we were successful in allocating funding to managers who subsequently outperformed.

Portfolio managers and analysts

Our analysis shows that there was a difference in performance between the sector portfolios run by experienced portfolio managers and the portfolios where we used former analysts as portfolio managers. Our preference was to hire experienced portfolio managers, but in many sectors these did not exist. The mandates managed by experienced portfolio managers generated an excess return of 1.9 percent, while the analyst-run portfolios had a negative relative return of -4.5 percent. Both numbers are the annualised relative return before fees. The performance of the portfolios run by analysts was particularly poor towards the end of the period, when there was only one mandate left in this category, which may distort the lessons from the performance numbers. On an asset-weighted basis, the excess return was 1.8 percent for the experienced managers and -1.7 percent for the analysts we awarded portfolios to.

While some of the analysts turned out to be very good portfolio managers and generated a good excess return, others were not able to make the transition from analyst to portfolio manager. In the end, only 39 percent of the analyst-managed portfolios outperformed their benchmarks. In comparison, 71 percent of the managers we selected who ran existing sector products outperformed their benchmark.

Mandates managed by portfolio managers with previous experience running portfolios outperformed in 65 percent of up-market months and 54 percent of down-market months. Mandates managed by analysts outperformed in only 44 percent of up-market months and 41 percent of down-market months.

Over time, we became increasingly aware that the analyst portfolios were not delivering according to our expectations. We tried to improve this by making the mandates more and more specialised and customised. The general idea was to focus the mandates on the areas

where the analysts had the greatest knowledge. However, we found that performance was even lower for mandates with narrow benchmarks. Mandates with fewer than 85 companies in their benchmark underperformed, while those with more outperformed.

Financial crisis

The importance of portfolio managers with experience was particularly evident during the global financial crisis and the subsequent rebound. The experienced sector portfolio managers were generally better at investing in the right companies and designing balanced portfolios. Overall, their portfolios had a beta of 1.02 versus their benchmark, while the analyst-managed portfolios had a beta of 1.06. During extreme market months with benchmark returns below -3.5 percent, the beta for the experienced portfolio managers' portfolios was 0.93, versus 1.24 for the analyst-run portfolios. This indicates that the experienced portfolio managers handled extreme market events better.

During the financial crisis, the analysts running portfolios for us did not reduce exposure to companies particularly exposed to the crisis early enough. In some cases, they closed out underperforming positions at the bottom and did not benefit from subsequent rebounds. The experienced managers had better-balanced portfolios going into the financial crisis and actively positioned portfolios to benefit from distressed valuations during the crisis.

Limited relevance of factors

We did not find traditional measures of factor tilts useful for analysing sector mandates. These factor measures, such as the Fama-French factors, are designed cross-sectionally across the entire market without adjusting for sector membership and characteristics. Frequently, entire sectors would cluster in the same factor category. As a result, these traditional factor definitions did not yield much information when it came to analysing a specific sector. We found that bucketing the mandates in categories often gave nonsensical outcomes and was highly dependent on definitions of the factors.

Two relevant factors are size and earnings revisions, since we believe they are more comparable across market segments. Managers who were overweight in small companies did better than managers overweight in larger companies. The top third of portfolios in terms of exposure to small caps outperformed by 1.7 percent, while the bottom third underperformed by 1 percent. This could indicate that sector-specific knowledge is best utilised in smaller companies.

Another clear differentiator was the mandates' exposure to stocks with positive company-level changes in sell-side earnings estimates. The managers who were overweight in companies that had their earnings revised up did better than managers who were not. This is based on observable data in that these are revisions that had already taken place. The top third of mandates in terms of exposure to high-revision stocks outperformed by 3.5 percent, while the bottom third underperformed by 4.2 percent. This pattern was consistent over time. While we always searched for managers with a long-term fundamental analysis framework, this shows that managers who paid attention to changes in underlying developments and positioned the portfolio accordingly benefited from it.

Not seeing the wood for the trees

The outlook for a company's finances can be split into direct effects and indirect effects. Direct effects include everything directly affected by management decisions, such as product development, cost control, capital

expenditure and distribution plans. Indirect effects include changes in demand, the overall economy and developments at competitors. The analysts often knew more about individual companies than the experienced portfolio managers, while the portfolio managers tended to have a better overview of how the various sub-segments of the markets they covered were evolving. One could say that the analysts sometimes became too myopic in their focus on companies. We found that the best experienced portfolio managers not only had a great deal of company-specific knowledge but were also able to position themselves in sub-sectors exposed to industry-wide positive or negative developments. Global mandates gave greater scope for utilising this skill.

One measure of positive sub-sector developments is the proportion of earnings estimates in the sub-sector being upgraded at any point in time. For example, investing only in the top third of portfolios in terms of exposure to sub-sectors with the highest earnings revisions would have led to an excess return of 1.2 percent. The bottom third of portfolios underperformed by 1.1 percent. This is not a strategy that can be implemented in practice, but it shows the importance of sub-sector positioning.

However, despite the importance of fully understanding the underlying sub-sector developments, the main reason for excess returns was positioning in individual companies. Broader trends will affect different companies to different degrees. Detailed analysis is needed to clearly untangle the differences in sensitivities between different companies. We found that the best sector managers had a very solid understanding of the sensitivities of individual companies to sub-sector trends and were able to position themselves in companies that benefited the most.

Chart 23 Sector mandates. Market value since inception. Billion kroner

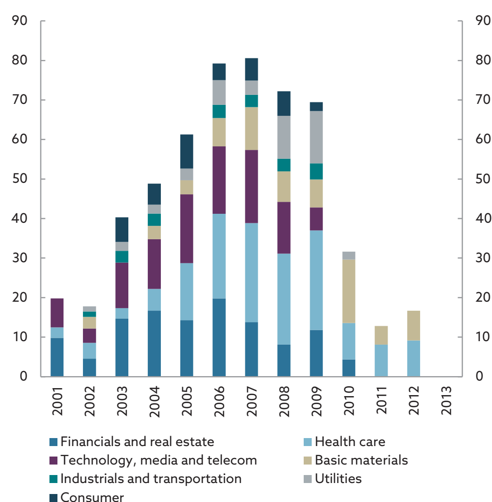


Chart 24 Sector mandates. Number of mandates

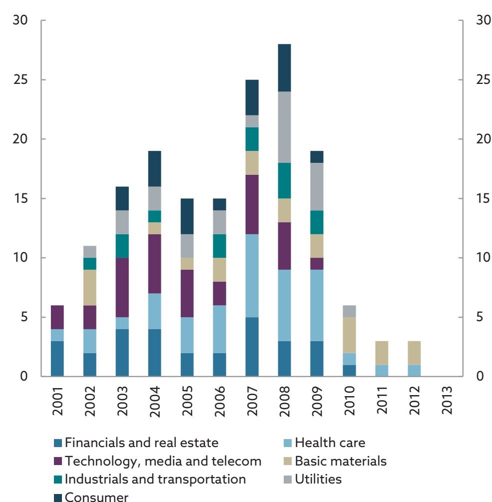


Chart 25 Sector mandates. Percentage of benchmark companies in the portfolio

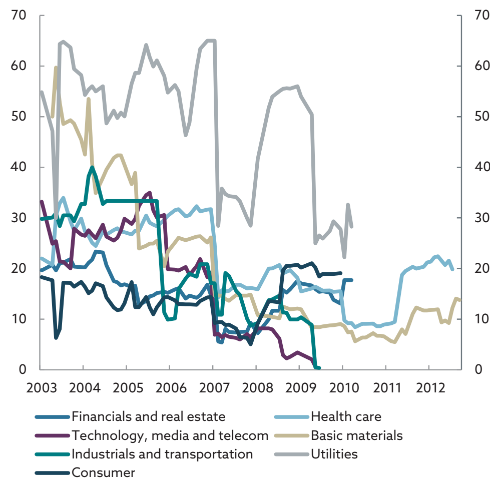


Chart 26 Sector mandates. Average number of companies in the portfolio

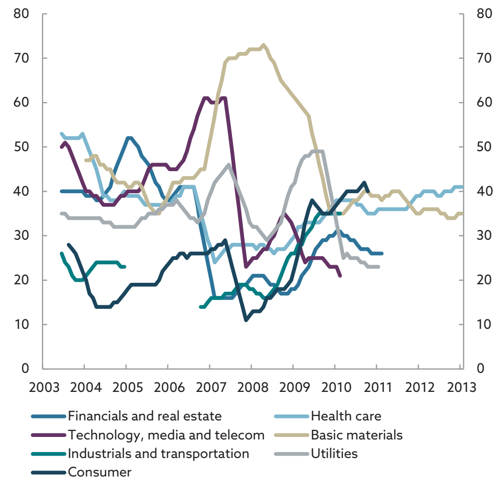


Chart 27 Sector mandates. Active share over time

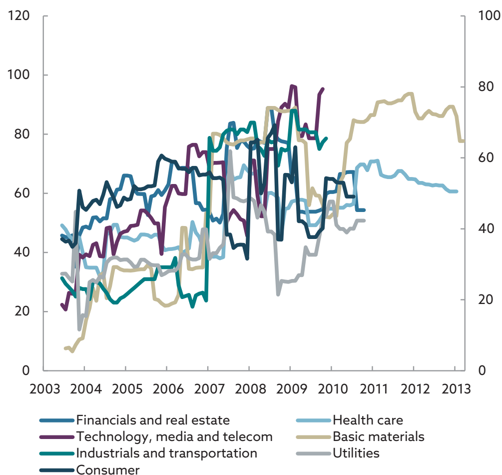


Chart 28 Sector mandates. Average share of managers' top ten holdings. Percent

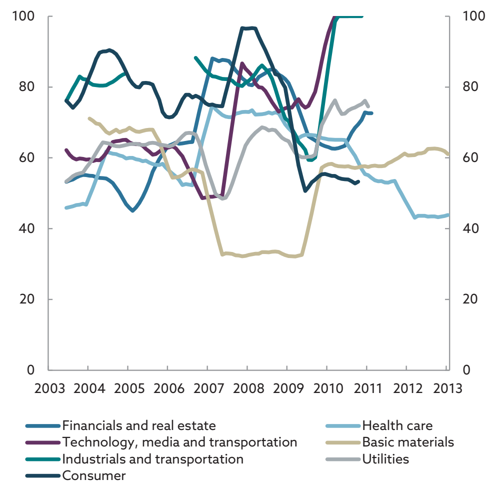


Chart 29 Sector mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

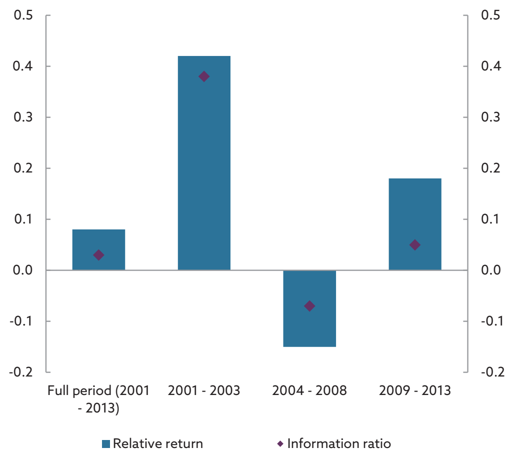


Chart 30 Sector mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

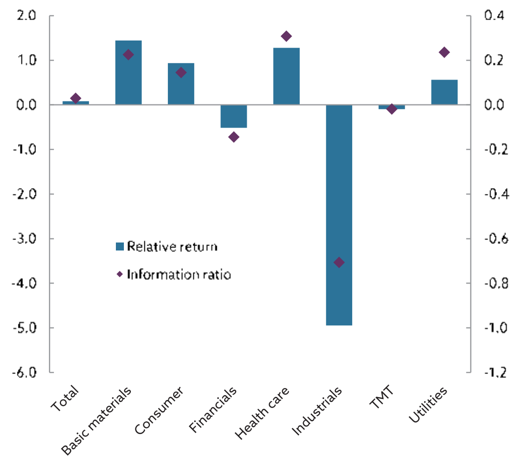


Chart 31 Sector mandates. Annualised relative return in percent (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate

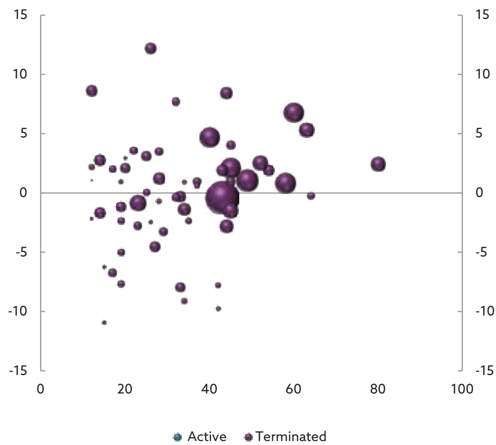
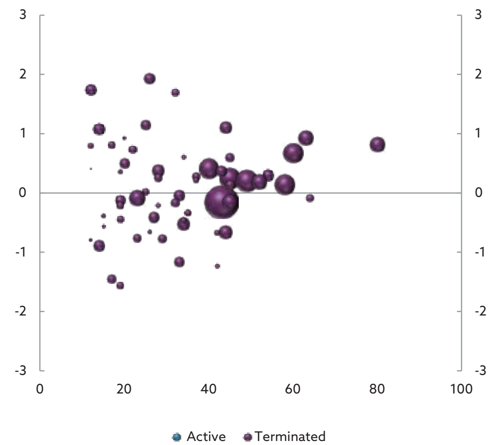


Chart 32 Sector mandates. Annualised information ratio (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate



Emerging markets mandates 2005-

As the fund's benchmark and investment universe have expanded over time into emerging and frontier markets, so have our investments in these markets. We employ locally based emerging markets managers to gain exposure to the most attractive companies in these markets. These portfolio managers have a deep understanding of company-specific issues.

As the fund grew in size and the capital markets in emerging markets matured, our mandate was expanded to permit investments outside developed markets. Brazil, Greece, Mexico, South Korea, Taiwan, Thailand and Turkey were included in the benchmark index in 2000. Four years later, the fund was also permitted to invest in Chile, China, the Czech Republic, Hungary, Indonesia, Israel, Malaysia, the Philippines, Poland and South Africa. Following this, in 2005, we started looking for external managers in certain emerging markets. However, it was not really until 2008, after the fund's transition to the new benchmark was completed, that we started focusing on selecting external managers in all emerging markets. Since then, we have awarded mandates in most emerging markets and several frontier markets. These are, with few exceptions, single-country mandates where the portfolio manager is based locally in the same country as the mandate. The exceptions are in sub-Saharan Africa, the Arabian Peninsula and South Eastern Europe, where some of the smaller markets are combined into single mandates.

Emerging markets have a wider dispersion than developed markets in terms of regulations, distribution of information and quality of investment managers. A larger proportion of companies are controlled by single families or by governments. Furthermore, corruption risk is perceived to be higher in these markets, and some governments have a lower hurdle for interfering with management and strategy. To invest in these markets, we saw it as important to have managers based in the market, with a deep understanding of local dynamics, who spoke the language, knew the culture, had access to management and other personnel in the companies they invested in, knew the history of the families that were the majority owners of the companies, and understood the risks of investing in partly state-owned enterprises. Locally based managers are, in our opinion, typically better placed to evaluate corporate governance risks, as well as the consequences of government measures.

The history

The first mandates 2005-2007

We started our investments in emerging markets in 2005 with single-country mandates in two of the largest markets, India and China, and an ASEAN mandate covering Indonesia, Thailand, Malaysia and Singapore. These were markets where local managers who focused on fundamental research could avoid companies with corporate governance issues and at the same time benefit from the rapid economic growth expected there.

India was the first emerging market we started to look at in 2005. At that time, the country was running at close to 7 percent GDP growth and 6 percent inflation. This implied that the underlying local businesses should be able to generate nominal revenue growth of 12-13 percent. We expected profit margins to improve as Indian companies used their human and capital resources more efficiently. It was, however, important to identify which companies had the ability to make these efficiency gains. We therefore chose India as our first market for an emerging markets mandate, even though it was not part of the benchmark yet, and we awarded our first mandate in July 2005. The Bombay Stock Exchange (BSE 30) climbed 21 percent between the time we entered the market and the end of 2005, measured in US dollars, and gained another 49 percent in 2006. At that point, we withdrew from the market and decided to revisit it at a later stage.

2007 was also a good year in India, but then the market tumbled 62 percent in 2008. We re-entered the market with one mandate in December 2008 and another in May 2009. Some of the issues that had led to the sharp market deterioration, such as shortages of skilled labour, a weak currency and commodity prices, seemed to have eased. In 2009, our portfolio return was 115 percent, 6 percent more than the Indian market.

The second emerging market we entered in 2005 was China. The MSCI China was trading at 10 times earnings, and Shanghai-listed companies at 20 times earnings. With the anticipated market reforms, especially at state-owned enterprises, we evaluated the market as having good potential. We selected two Chinese managers in June 2005. One of the Chinese managers invested in companies listed in Hong Kong, known as H-shares, while the other invested in domestic shares listed in Shanghai and Shenzhen, known as A-shares. Initially, we arranged a swap facility with a counterparty to borrow part of its qualified foreign institutional investor (QFII) quota for investing in A-shares, as Chinese regulations limited the amount of foreign investment allowed in the local stock market through quotas.

In order to ensure that we had relevant local market knowledge, one member of the external management team relocated to Shanghai in 2006. This provided the benefit of increased market knowledge, easier access to the local investment managers, and improved coverage of other markets in the region.

During 2007, we became increasingly concerned about the A-share market. The key issue was high valuations and excessive optimism about future growth. By the end of 2007, the price/earnings ratio of the A-share market was 74, and we had reduced our investments in Chinese companies and increased our cash position to 50 percent.

After opening an office in Shanghai in 2007, we received our first direct QFII quota of 200 million US dollars in January 2008. We waited some months after receiving this quota until the

market had gone through the full boom-bust cycle before actually starting to increase our investments in China.

In 2005, we awarded an ASEAN mandate covering Thailand, Indonesia, Malaysia and Singapore, with the portfolio manager based in Singapore and analysts located in each of the countries. The markets had recovered from the Asian financial crisis in 1998, and we expected them to benefit from increased trading with China. We needed a manager on the ground who could buy into the right companies to capture this growth. In 2008, the ASEAN mandate was terminated, and we awarded mandates to local managers in each of these markets. We expected local country managers in South East Asia to have an even better understanding of local regulations and market specifics.

Increasing the investments 2008-2012

Once the implementation of the expansion of the fund's strategic benchmark to include all countries classified by FTSE as emerging markets was completed in 2008, we gradually awarded new mandates in more emerging markets as well as additional mandates in India, China, Malaysia, Thailand and Indonesia.

The new markets we started with were Brazil, Russia and South Africa, as investments there were expected to be substantial. Export demand from the pre-crisis boom was a big driver of economic growth in what became known as the BRICS countries. The first formal BRIC summit commenced on 16 June 2009, while South Africa became a member nation on 24 December 2010.

On 15 September 2008, Lehman Brothers went under and global financial stress turned into a full-blown international crisis. The financial crisis showed how important it was to have our managers on the ground understanding how slower growth in world trade and the threat of trade wars would impact the companies they invested in, as well as which companies to avoid. Our managers in emerging markets gained 57 percent during 2008 and 2009. Their relative return was 5.8 percent when the market fell in 2008, and 11.8 percent when the market bounced back in 2009.

By the end of 2008, we had 16 billion kroner invested with ten managers in these markets. In 2009, we included Turkey and Poland in our search for managers, and we had 47 billion kroner with 19 managers in emerging markets at the end of the year.

We entered Mexico and Chile in 2012. At the same time, we awarded mandates in a range of other emerging markets and allocated more money to existing managers.

In 2012, we also expanded into smaller emerging markets and awarded a mandate for Egypt. Finding an asset manager in this market with not only a knowledgeable portfolio manager, but also adequate operations and compliance procedures, was difficult. We realised that, in some of the markets we were about to enter, we would have to participate in the professionalisation of the asset management industry in order to have managers that were up to our standards.

During the first eight years of selecting managers for emerging markets, we selected a total of 38 managers and terminated eight of them. The main reason for termination was that our designated portfolio manager had left the firm awarded the mandate. By the end of 2012, we had 76 billion kroner invested with 30 managers in most of the emerging markets in Asia, Europe and Latin America.

Navigating through turbulence 2012-2018

We went from 76 billion kroner invested in emerging mandates at the end of 2012 to a peak of 326 billion kroner at the end of 2017. The build-up in emerging markets was due to a strategic shift from sector and regional mandates into emerging mandates. The growth in emerging markets coincided with rapid growth in the fund's total market value.
In 2014, international economic sanctions were introduced against Russia following its annexation of the Crimean Peninsula and occupation of eastern Ukraine. This gradually weakened growth in Russia as well as countries with significant exports to the country. Falling oil prices, international sanctions and reduced confidence from market participants led to a significant devaluation of the rouble. The Russian market declined considerably, and we saw the importance of selecting the right companies.

Brazil's economy boomed in 2003-2014, partly due to increasing demand for commodities in China. There was an expanding middle class, and many of our external managers had investments in companies serving this growing consumer segment. However, 2014 saw a turn for the worse as the economy contracted, partly as a result of reduced Chinese demand. It was also reported in 2014 that large construction companies in Brazil had overcharged the state-owned oil company Petrobras for contracts, and that the money was later given to Petrobras executives and politicians. This had a negative impact on the Brazilian economy and foreign investments. The external portfolio managers invested large parts of their portfolio in the electric utility sector, which was considered less exposed to the business cycle and home to a number of company-specific investment opportunities tied to more efficient operations.

China experienced strong growth over the period 2013 to 2018. This stable economic growth contrasted with very volatile asset markets. During the period, growth in China became more focused on an emerging middle class. High and stable wage growth had increased living standards and created a massive market for consumer goods. At the same time, the Internet had transformed China, with domestically invented world-leading technology revolutionising the daily lives of its citizens. China now led the world in payment technology, online gaming and social networks. Early on, our external managers understood the profound changes technology would bring and the earnings potential of these companies. They were overweight in specific technology and consumer-oriented companies and invested less in financial, oil, basic materials and industrial companies, where they found fewer opportunities.

Emerging markets are prone to periods of exuberance from investors, often led by foreign investors located far from the country in question. One such example was the "Mexican moment" following the election of Peña Nieto as president at the end of 2012. Through cross-party agreements, substantial constitutional changes were enacted to liberalise the oil sector, improve the education sector and introduce several other structural reforms. The reforms impressed foreign investors, leading to a boom in the stock market in anticipation of an improved economic outlook. Our local investors, however, concentrated on a different part of the economic reforms. They compared the original texts of the reforms and discussed implementation with local regulators. The reform they focused on was the government's drive to enhance competition and reduce excessive profits for local oligopolies. Their projection was that this would lead to lower

profits for some of the larger companies in the local stock market. As a result, they stayed away from many large, well-known consumer and telecom companies and concentrated on smaller industrial companies that stood to benefit from the market liberalisation.

Frontier markets

In December 2012, we awarded our first frontier market mandate, an African mandate initially focusing on Kenya and Morocco. In the following years, we expanded the mandate, as well as new country-specific searches, into more frontier markets as they were added to our investment universe. Before investing in any new market, our market approval process involves various units in the risk, legal, operations and compliance departments. The purpose of the approval process is to ensure that relevant risks are identified, assessed and accepted, and that the decision to invest in the new equity markets is in line with the fund's overall investment strategy.

In several countries, we have worked not only with the selected asset management firm to raise standards in their operations and compliance departments, but also with local regulators to improve market standards.

Frontier markets offer a different investment environment and opportunity set to other markets. These are even faster-evolving markets with higher growth profiles, skewed and sometimes explosively changing demographics, developing social structures and a lack of infrastructure. They are often on course for inclusion in the emerging markets benchmark. Rather than waiting for the countries to be included by the benchmark provider, we have decided to invest in expectation of inclusion. The advantages are twofold. First, the fund becomes more diversified. Second, we reduce the total costs for the fund: prices are generally higher once a market is included in the benchmark, as many institutional funds buy at the time of announcement or at the actual point of inclusion.

During 2015, investments in Botswana, Ghana, Jordan, Mauritius, Tunisia, Oman, Saudi Arabia, Croatia, Romania, Slovakia, Iceland, Vietnam, Sri Lanka and Bangladesh were also approved. By 2018, investments in Estonia, Latvia, Lithuania and Slovenia had been added to the list. For Bangladesh, Sri Lanka, Vietnam, Kenya, Morocco and Saudi Arabia, we opted for single-country mandates, awarded to a locally based manager in the relevant country. These markets were large enough to warrant a country-specific mandate. For sub-Saharan Africa, South East Europe and the Arabian Peninsula, we have mandates where some of the smaller markets are combined.

Information flows are typically slow, and market transparency relatively low, in frontier markets. Taking this into consideration, we started with a small investment and grew as we became more confident in the market and the specific manager's competence. At the end of 2015, we had 11 billion kroner invested, split between Asia, Europe, the Middle East and Africa. At the end of 2018, this had grown to 19 billion kroner. Of this, 15 billion kroner was funding and 4 billion kroner was due to market movements.

As our investments in frontier markets expanded, we saw that certain sectors in these markets could be more exposed to certain environmental, social and corporate governance risks. To reduce these risks, we removed 12 sub-sectors from the benchmark we gave external managers from 2015 onwards. These included three sub-sectors within oil and gas (exploration and production, integrated oil and gas, and oil

equipment and services), eight within basic materials (aluminium, non-ferrous metals, iron and steel, coal, diamonds and gemstones, general mining, gold mining, and platinum and precious metals) and one within utilities (conventional electricity). This helps ensure that they take particular care before investing in such companies.

We have also removed certain other companies and sectors from the managers' investment universe. These include all companies that we have divested from following risk-based assessments. The integration of environmental, social and governance issues into our risk management may result in divestment from companies where we see elevated long-term risks. We have done this since 2012. These are companies that do business in a way that we do not consider sustainable, or could have negative financial consequences. The list of risk-based divestments is continuously updated. Our external managers may also provide input on companies in their market that may be candidates for risk-based divestment. This input is made possible by the knowledge of individual companies achieved through in-depth research and managers' awareness of our particular attention to these risks.

Our focus on corporate governance means that we would not have chosen to invest in companies listed in frontier markets without the local specialists working for us in each of these countries. Their view on taking into consideration environmental, social and governance risks, and thereby avoiding companies we do not want to be invested in, has been absolutely crucial for us.

The challenges

Capturing emerging growth

Prior to investing with external managers in emerging markets, we conduct an analysis of the equity market. This analysis is conducted to determine where to invest, how to invest, and how the investments should be phased in over time. We take a cautious approach to new markets by investing gradually over several years. The market analysis focuses on an assessment of the market structure and the overall risks that are attached to the market. This includes an evaluation of market diversity in terms of several factors, such as company sizes and market capitalisation. For example, we would evaluate whether a small number of companies dominate the market, or whether there are many similarly sized stocks. We also look at sector and sub-sector dispersion. For example, we would consider whether the market is dominated by one particular sector, such as basic materials or financials.

We invest in emerging and frontier markets because we want to be exposed to future growth in these markets. According to the World Bank Global Financial Inclusion Database, about 1.7 billion adults globally remain unbanked, without an account at a financial institution or through a mobile money provider. Almost all of these live in the developing world, and nearly half in Bangladesh, China, India, Indonesia, Mexico, Nigeria and Pakistan. As emerging markets grow, urbanisation expands, and more people are brought into formal employment, demand for financial services is expected to increase. The emergence of a middle class has led to greater consumer spending in most emerging markets and there is an opportunity for domestic companies to meet the demand for both consumer services and consumer goods. Many smaller frontier and emerging markets

have economies that are less correlated with global trends, and investing in consumer services diversifies the fund's cashflows by bringing real exposure to the local economy. There is considerable demand for better infrastructure in emerging markets, and this spells opportunities for companies involved in owning, operating or maintaining everything from railway lines and airports to water, telephony and data networks. In addition, there are industries related to these sectors within materials and engineering, conveyance of goods, people and services, and communication services.

We have decided not to have global emerging markets mandates that invest across multiple markets, where the emphasis is on allocating investments between different countries based on cyclical growth factors tied to the state of the economy, such as corporate earnings, interest rates and inflation. We have single-country mandates and look at long-term trends within the specific market. To be able to do this, we need managers with a deep understanding of the local market and of company-specific issues. We need someone who can construct a portfolio of carefully selected companies and avoid those with elevated valuations and poor corporate governance. By having single-country mandates for each of them, our attention is on long-term trends within the countries, and not on allocating investments between countries.

Defining the universe

The investment universe for each of the managers is defined as the listed companies in the market where they are based and have their skill set. This is a wider universe than the benchmark. The FTSE Global All Cap, which forms the basis for our benchmark index, is designed to reflect the investment opportunity set available to typical international investors, which is often narrower than what we see as our opportunity set.

FTSE Russell conducts an annual review of which countries should be included in the index and whether they should be classified as frontier, emerging or developed. The classification process includes both a technical evaluation of the market and an assessment of the securities trading system in each country.

The index provider's classification process also includes an assessment of which companies should be in the benchmark. This assessment is mainly based on the companies' market value and liquidity, with different cut-offs depending on which development category the country belongs to. Companies therefore enter and exit the benchmark when a country is moved from one category to another. For example, when MSCI reclassified Greece from emerging to developed in 2001, the number of companies in the index went from 142 to 50, and the corresponding market capitalisation from 135 to 57 billion US dollars. When Israel was reclassified from emerging to developed in 2010, the number of companies in the index went from 174 to 84, and the corresponding market capitalisation from 330 to 141 billion dollars. When Morocco was classified as emerging in 2013, it had four companies in the index, while it had 17 companies in the index after being reclassified to frontier status the same year, with the corresponding market capitalisation increasing from 22 to 39 billion dollars. For us as a long-term investor, the investment opportunities in a country do not change with a reclassification, and it would be unwise and expensive to trade companies based on whether the index provider classifies a country as a developed, emerging or frontier market.

Until 2011, all managers had a benchmark weighted by market capitalisation, based on the companies listed in their respective country. In 2011, we removed the 50 largest stocks in emerging markets from the managers' benchmark and began managing them internally in an enhanced index portfolio. The thinking was that we did not want to pay the managers to hold the largest names. As there were frequent changes in which companies were part of the top 50 from quarter to quarter, the management of the aggregate portfolio became unnecessarily complex. Furthermore, as we found severe corporate governance issues with many of the 50 originally removed from the benchmark, we needed our managers on the ground also to have a focus on these names.

In 2013, therefore, we changed the concept by giving the managers a benchmark where the largest companies had a maximum weight in the benchmark. There was no maximum weight in any of the positions in the portfolio, however. The aim has been to get the best possible investments, as well as to control the fees paid. For managers with a mandate in a country with many constituents, such as Brazil, China, India, Malaysia, Thailand, Turkey, Poland and Israel, the benchmark weight was capped at 5 percent for individual companies. For managers with a mandate in countries with fewer and several dominant constituents, such as Russia, Indonesia, Mexico, South Africa and Greece, the maximum benchmark weight was set at 7.5 percent. With this benchmark weight, the managers had all their attention on constructing the best possible portfolio, without casting their eye on the relative volatility of not owning some of the largest companies. Their benchmark was furthermore now more aligned with the average market capitalisation in their portfolio, meaning that we avoided paying fees for excess performance originating from having smaller companies in their portfolio compared to their benchmark. In 2018, we decided to increase the maximum weight in the benchmark to 10 percent.

Identifying emerging managers

Our experience has been that companies in emerging markets publish more, better and more timely information in the local language. Having managers on the ground who speak the language and understand the culture is therefore important to understand the risks and opportunities in the market and at different companies. There are obviously also managers located outside the local market who speak the language and know the companies, but it is difficult to argue that they have an information advantage over those located close to the companies, living and breathing the market in question. Frequently, foreign investors' attention is also not fully on a specific country, but extended to include a larger part of the region or other emerging markets.

Our starting point when entering a new market is an assessment of the local asset managers – who they are and their investment patterns. In some of the markets, this is difficult, as there is no central database where we can find statistics and identify candidates. We therefore need to do our own research to find managers. We have established an approach where we interview local brokers, companies and market participants, among others, to get a good understanding of the different types of local managers and their ownership and client structure. We ask them about which firms attract the best analysts and which teams ask the right questions at the right time. The aim is to identify which asset managers are present in the market, and which asset managers we should contact with a request for a response to our initial questionnaire and for an initial

interview. Their answers form the basis of a first screening. Based on further analysis of the managers' portfolio, we select a shortlist of firms to be visited.

During these visits, we gain a better understanding of the different managers in the country, and we obtain names of other potential managers. These new managers are then approached with the same short questionnaire as the original group, and potentially followed up with an initial meeting.

Managers who we still find interesting for a specific mandate after a first on-site meeting will be further evaluated through in-depth analysis of their portfolios. This analysis covers changes in holdings over the last year, as well as differences in portfolios across managers at different asset management firms. These changes and differences form the basis for the interviews on site with the portfolio managers and analysts. It is important to find managers who construct their portfolios based on their own analysis, are humble enough to change their view if mistaken, and have an understanding of what information is already priced into a stock.

A high degree of overlap in the portfolios of the managers we evaluate may indicate that they are following the market rather than relying on their own proprietary analysis. Too little overlap in the portfolios between time period snapshots indicates that they are more traders than owners. The managers must see themselves as owners of the company, not just traders of ideas.

This eventually leads to a final phase of the selection that begins with a comprehensive second questionnaire, which includes questions about the organisation, board members, operational procedures, compliance routines, licence to operate, regulatory issues, quarterly portfolio holdings over the last three years, and how they work with sustainability and corporate governance.

We analyse the portfolio's characteristics over time based on quarterly holdings, and how different market scenarios impact the portfolio. These holdings serve as a good starting point for discussions with investment personnel on what kind of analyses and portfolio construction they utilise. These discussions are fundamental in understanding whether the manager can generate good performance in the future. During these on-site meetings, we also discuss implementation with the traders. The companies in emerging markets are often small and illiquid, and how the traders find pools of liquidity to buy and sell companies as instructed by the portfolio manager may have a huge effect on market impact costs.

When reviewing managers, we have found that conflicts of interests can at times be a key factor in our decision not to appoint certain asset managers. For example, we have evaluated asset managers affiliated with brokers and large financial institutions where we have not been satisfied with the strength of the control across the different businesses. In other cases, asset managers owned by financial institutions have had restricted freedom in defining their own strategy. Smaller, independent asset managers, however, are sometimes faced with other challenges, such as a lack of sufficiently independent compliance. To evaluate this, we meet their operations and compliance personnel on site. There have been several cases where we have found their standards to be below what we require, and have worked with the firm to improve its procedures before awarding a mandate.

We have a preference for privately owned asset managers. The main reason is that we have seen that they have more stable teams than asset managers owned by other types of financial institutions. We have, however, found several times that the smaller asset managers do not have the necessary scale to manage the size of assets we would request. We would not represent more than 50 percent of the business of any firm, the main reason being the potential risk we face from the actions of a manager that is overly dependent on keeping us as a client.

Given that information is less transparent in many emerging markets, we have initiated additional control processes. We decided in 2009 to hire an external auditor to undertake an enhanced integrity due diligence of all our chosen investment firms and key individuals. Both managers selected before 2009 and those hired subsequently have been subjected to this review. The objective of the review is to identify the background, professional network, links to entities and individuals, corporate affiliations, reputation, regulatory actions and litigation, sanctions, adverse media findings and likely integrity of the firm and key individuals. This due diligence is undertaken to get a third party's view, in addition to the similar due diligence we perform internally, to make sure that no stone is left unturned with our external managers.

Investing in better companies

Our managers focus on thorough fundamental company research, such as visiting factories and scrutinising reports. This often leads to a concentrated portfolio of companies. This concentration of investments reduces the governance risk, as most aspects of the companies in the portfolio are analysed.

If we had invested in the benchmark as it is, we would have held a considerably higher number of companies in emerging markets. At the end of 2018, our external managers were invested in only around a third of the 2,470 companies from emerging markets included in the benchmark index. In China, for example, there were 845 companies in the benchmark at the end of 2018, while we were invested in only 130. Over time, we have found that we are not invested in about 75 percent of the companies in the fund's strategic benchmark due to the local managers' portfolio construction. Our external managers thus play a crucial role in avoiding a great number of the companies in the benchmark and invest in a careful selection of companies.

Our managers also expand our investment universe. At the end of 2018, they were invested in 849 companies that, for various reasons, were not part of the fund's benchmark index. Of these, 131 were our investments in frontier markets, and 100 were our investments in Chinese A-shares. We would not have had access to these investments in emerging and frontier markets without on-the-ground research by local portfolio managers.

One challenge when investing in emerging markets is addressing governance risks, which are generally perceived to be higher in these markets than in developed markets. Good governance of companies is vital to ensure that they follow up on environmental and social risks associated with the company's activities. Our experience is that local variations, combined with limited disclosure by many emerging markets companies, present significant challenges for outside investors. Investing with external managers in emerging markets ensures rigorous analysis before investing in any company. Direct engagement with companies on a regular basis is necessary to understand these risks. Our view is that investors with a local presence, no language barriers and a

knowledge of the history of the company's management, board and owners, are generally better positioned to mitigate governance risks and avoid potentially fraudulent companies.

Our portfolio managers must have an understanding of our priorities in terms of responsible investment and be able to demonstrate how these are integrated into their investment activities. Our expectation documents on climate change, water management, ocean sustainability, children's rights, human rights, anti-corruption and tax transparency are distributed to all our asset managers. We regularly follow up whether management quality, shareholder rights, corporate governance, and social and environmental responsibility are among the factors considered when they evaluate investment opportunities.

During the on-site meetings, we also discuss companies in the external managers' universe that they do not want to buy. Not owning a company is frequently based on the stock being too expensive, uncertainties in the company's market situation, issues related to environmental, social and governance risks, a management that does not meet governance standards, or board members who are not independent. In 2013, we collected information from managers on companies with significant governance issues and added a list of companies to our agreements with managers where they were required to provide us with a written investment case, including a risk assessment, before investing in them. In 2014, rather than requiring an investment case, we included these names in the list of stocks prohibited in the managers' investment universe. In 2017, we changed the procedure, such that information about companies with governance risk is forwarded to the department in the fund that is responsible for risk-based divestments. Based on available information from the external managers, the company itself and external databases, the group then evaluates the issues and brings the case to the Investment Universe Committee if it concludes in favour of divestment. This process ensures that information from the locally based external managers on companies the fund should abstain from holding is treated safely, efficiently and fairly across the entire fund.

One of our most important insights is that external managers are the best possible filter we can apply to our investments in emerging markets to ensure that we have a sustainable portfolio of companies. We determined, and still believe, that local managers are well suited to investing in markets where corruption risk is perceived to be higher, governance fragile and governments less predictable.

The return

The external mandates in emerging and frontier markets have had an annualised return of 12.4 percent before fees since inception in 2005. They have delivered an annualised excess performance of 4.2 percent before fees in the same period, and 3.5 percent after fees, measured against their benchmark. Their benchmarks are composed of equities with the same investment universe and similar average market capitalisation to each of the external managers' portfolios. That means, for example, that a manager with an Indian mandate will be measured against a broad index of Indian stocks where each stock is weighted by market capitalisation. The information ratio for the mandates combined has been 1.1 for the excess return before fees.

Relative returns have been positive in each five-year sub-period, with 2005-2008 having the highest annualised relative performance of 6.8 percent before fees. At that time, however, only limited assets were allocated to emerging markets managers. It is in the last two five-year sub-periods, 2009-2013 and 2014-2018, with an annualised relative performance of 3.3 and 3.4 percent respectively, and more assets in emerging markets mandates, that we have seen the main contribution to the excess return in Norwegian kroner.

All regions have contributed positively to the excess return in emerging markets. European emerging markets mandates have delivered an annualised excess return of 9.0 percent and an information ratio of 1.6, Latin America 5.2 percent and 1.4, China 5.0 percent and 0.8, Middle East and Africa 2.1 percent and 0.5, and Asia excluding China 1.9 percent and 0.5.

Consistent return

Most of our emerging markets mandates have delivered good results. Out of 111 emerging markets mandates, 80 have outperformed the benchmark, while 31 have underperformed. The average annualised excess return of the mandates that have outperformed is 6.9 percent, while the mandates that have underperformed have delivered an annualised relative return of -4.6 percent. A total of 58 mandates have generated more than a 2.0 percent annualised excess return, while only 18 have delivered a relative return below -2.0 percent.

While the overall results have been solid, there is a spread in results between different markets. We have seen the strongest results in the BRICS markets (Brazil, Russia, India, China and South Africa), where 80 percent of our managers have outperformed and the median information ratio is 0.5. In medium-sized emerging markets, such as Turkey, Malaysia, Mexico and Poland, 74 percent of our managers have outperformed and the median information ratio is 0.2. In smaller emerging and frontier markets, 52 percent of our managers have outperformed and the median information ratio is 0.0. These results correlate with the fact that we have had higher excess returns in markets where benchmarks are least concentrated and where there is a broad spectrum of investable companies including many not covered by the benchmark. The number of securities held by our typical manager is approximately the same in large, medium and small emerging markets, with an average of 29, 33 and 25 companies respectively. This is despite the investable universe being vastly bigger in the larger emerging markets than in the smaller ones. This indicates that the ability to use skill to avoid low-quality companies with poor corporate governance is greater in broader emerging universes. It is worth noting that, in addition to

generating returns, the emerging markets managers play an important role for the fund in avoiding investing the fund's assets in companies with low environmental, social and governance standards. Without these managers, there would be markets where it would not be appropriate for the fund to invest, leading to a less diversified overall portfolio.

The strongest performance, an 8.4 percent annualised excess return, has come from more concentrated portfolios, namely the 20 percent of the portfolios with the fewest holdings. This is in line with our hypothesis that more detailed knowledge of companies may lead to more concentrated portfolios, which again may lead to higher performance. Lessons learned from other strategies with external managers suggest, however, that the result may be more a function of portfolio manager experience. In other words, experienced managers with a better understanding of the underlying drivers of the market tend to have fewer stocks in the portfolio and thereby generate a higher excess return.

We have also seen that portfolios with the highest active share have had a stronger relative performance. The 20 percent of managers with the highest active share have on average had an annualised excess return of 6.7 percent, while the 20 percent of managers with the lowest active share have averaged an excess return of 1.6 percent.

Table 7 Emerging markets mandates. Number of outperforming and underperforming mandates

		Mandate relative performance	
Number of mandates	Total	Positive	Negative
Americas	**24**	**20**	**4**
Equal-weighted return, percent	5.0	6.7	-3.2
Asia excluding China	**28**	**21**	**7**
Equal-weighted return, percent	0.9	3.9	-8.0
China	**14**	**13**	**1**
Equal-weighted return, percent	11.7	12.7	-1.8
Europe	**19**	**12**	**7**
Equal-weighted return, percent	2.2	6.0	-4.4
Middle East and Africa	**26**	**14**	**12**
Equal-weighted return, percent	2.3	7.2	-3.4
Total	**111**	**80**	**31**
Equal-weighted return, percent	3.7	6.9	-4.6

Outperformance in falling markets

There has been a consistency in the relative performance of our emerging markets managers, with excess returns in 12 out of 14 years. If we look at consistency on a monthly basis, we find that emerging markets managers as a whole have outperformed in 62 percent of the months they have been funded. They have outperformed whether the benchmark return has been positive or negative, but have done even better in down-market months than in up-market months. In up-markets, they have outperformed in 51 percent of months; in down-markets, 78 percent of months. The mandates have returned 4.2 percent in up-market months, versus a benchmark return of 4.0 percent. In down-markets, the portfolio return has been -3.5 percent, versus a benchmark return of -4.0 percent. It is hence particularly in negative market conditions that our managers have shown their strength. Many of them are conservative when it comes to balance sheet strength and management quality. Many of our managers have learned through cycles that, when operating in emerging markets, it is important in terms of returns to have a focus on sustainable business practices and quality of operations.

This rather defensive portfolio composition is also reflected in the portfolio beta, which has been between 0.9 and 1.0 over the period for all five regions. Active portfolio management has led to higher returns with lower downside risks.

Table 8 Emerging markets mandates. Share of months with positive relative return. Percent

Share of months with positive return	Months outperforming	Portfolio return	Benchmark return
Americas	**64**		
Up-market months	45	4.4	4.5
Down-market months	85	-3.5	-4.5
Asia excluding China	**54**		
Up-market months	49	4.0	4.1
Down-market months	64	-3.6	-4.2
China	**57**		
Up-market months	54	4.6	4.4
Down-market months	62	-4.6	-5.3
Europe	**66**		
Up-market months	65	5.5	5.0
Down-market months	68	-3.7	-4.5
Middle East and Africa	**56**		
Up-market months	45	4.3	4.4
Down-market months	69	-3.1	-3.6
Total	**62**		
Up-market months	51	4.2	4.0
Down-market months	78	-3.5	-4.0

Adding value through funding

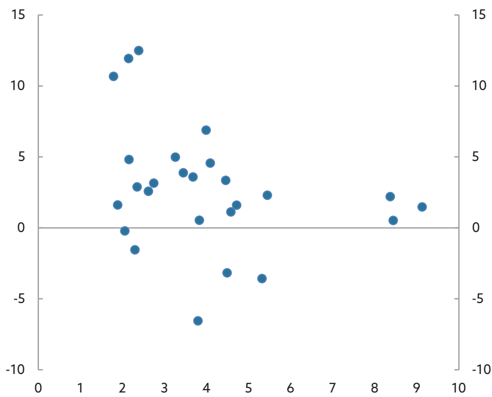
The annualised asset-weighted excess return before fees, meaning the monthly portfolio returns weighted by monthly assets under management, has been 3.4 percent, which is lower than the annualised time-weighted return of 4.2 percent. This means that we have experienced higher excess performance with lower funding in the mandates. This is mainly the case for Latin America and Europe. For the rest of the regions, the asset-weighted performance has been above or similar to the time-weighted excess return.

The annualised equal-weighted relative return, meaning the same weight for each mandate, has been 3.9 percent, meaning that we have allocated more to the managers with subsequently higher excess returns. Our strategy of increasing funding to managers with higher expected excess returns has worked well in all regions except for China, where the equal-weighted relative return has been higher than the time-weighted relative return.

Table 9 Emerging markets mandates. Time-, asset- and equal-weighted relative returns. Percent

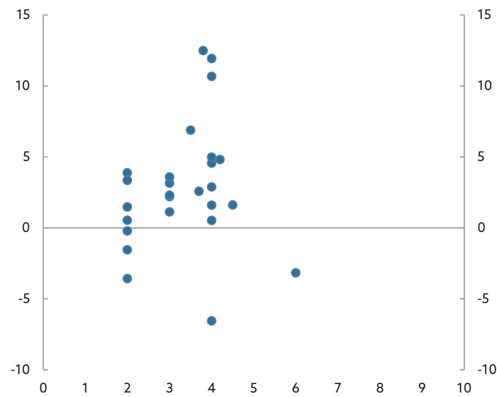
Relative return	Time-weighted	Asset-weighted	Equal-weighted
Americas	5.3	4.1	5.0
Asia excluding China	1.9	1.9	0.9
China	4.7	4.5	11.7
Europe	9.1	5.5	2.2
Middle East and Africa	2.1	2.3	2.3
Total	**4.2**	**3.4**	**3.7**

Chart 33 Corruption risk (x-axis) and relative return in percent. Country represented by a point. 0 is highest risk and 10 is lowest risk



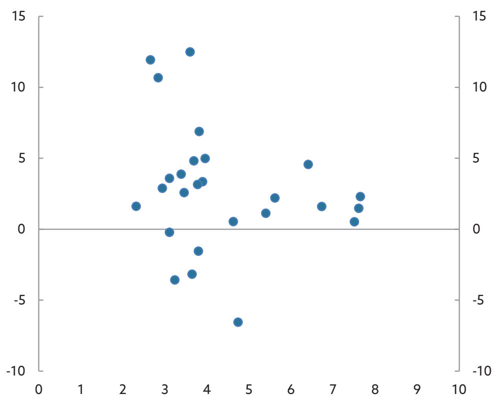
Source: Maplecroft and Norges Bank Investment Management

Chart 34 Investor protection (x-axis) and relative return in percent. Country represented by a point. 0 is worst protection and 10 is best protection



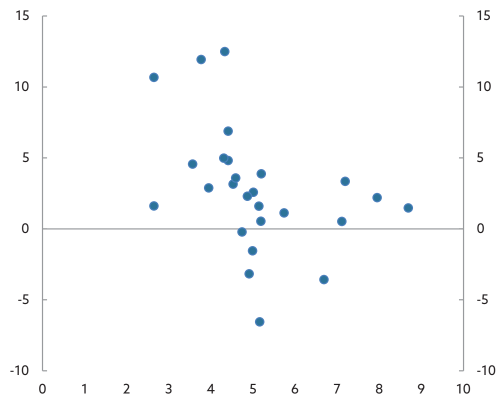
Source: Maplecroft and Norges Bank Investment Management

Chart 35 Human rights (x-axis) and relative return in percent. Country represented by a point. 0 is highest risk and 10 is lowest risk



Source: Maplecroft and Norges Bank Investment Management

Chart 36 Corporate governance (x-axis) and relative return in percent. Country represented by a point. 0 is highest risk and 10 is lowest risk



Source: Maplecroft and Norges Bank Investment Management

Avoiding unwarranted risk

Our experience with external managers in emerging and frontier markets has been very good. Not only have we seen excess returns across all the different regions and time periods, but we have seen that the managers have to a large extent been able to avoid companies with corporate governance issues that have been subject to unfavourable market movements. In particular, we have measured the excess performance in the different countries relative to their scores on various measures of human rights, anti-corruption, investor protection and corporate governance performance.

We have generated higher excess returns in countries perceived to have higher corruption risks and weaker protection of human rights, as well as countries that score low on factors relating to investor protection and corporate governance. These measures reflect the immaturity of the market, with slow flows of information and low market transparency. This could indicate that external managers in these markets help us avoid poorly managed companies, underlining the importance of active management in these countries. We find that in markets with poor governance structure, and where the efficiency of regulatory enforcement is relatively weak, local managers are important in reducing the risk of investing in companies with unsustainable business practices. This may be explained by our managers focusing on identifying stocks that benefit from changes in market conditions not priced in by other investors.

We have also found that local managers often have a better understanding of how global and national drivers impact local companies. It seems that locally based teams may have an advantage in assessing the relevance and impact of issues such as political change and swings in commodity prices.

Chart 37 Emerging markets mandates. Number of mandates

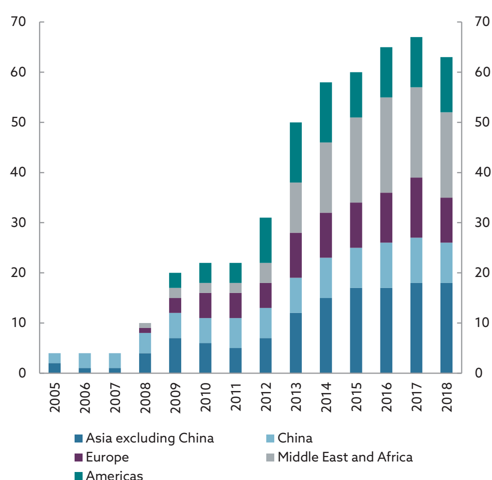


Chart 38 Emerging markets mandates. Market value since inception. Billion kroner

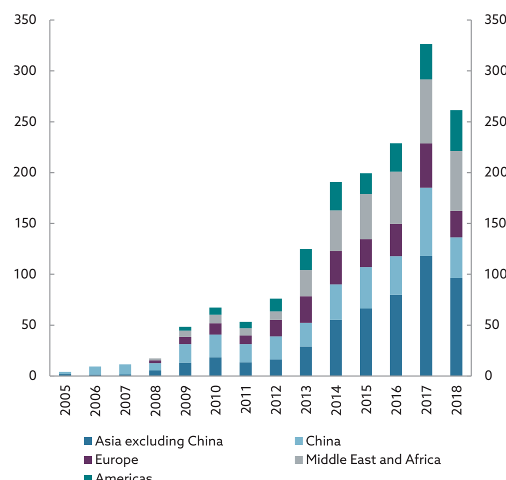


Chart 39 Emerging markets mandates. Percentage of benchmark companies in the portfolio

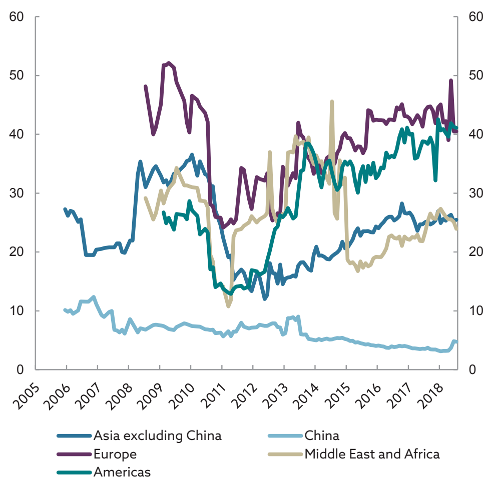


Chart 40 Emerging markets mandates. Average number of companies in the portfolio

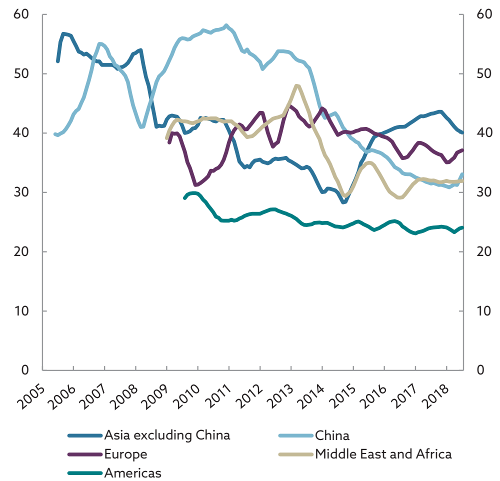


Chart 41 Emerging markets mandates. Active share over time

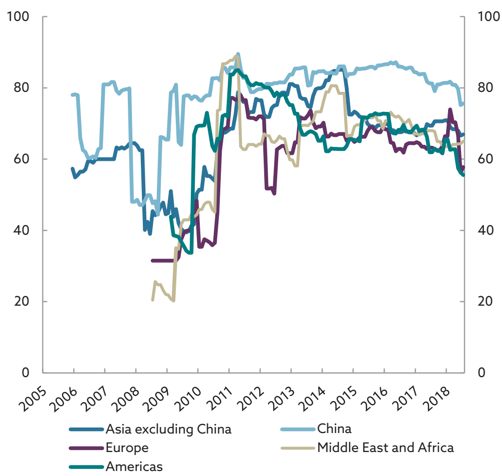


Chart 42 Emerging markets mandates. Average share of managers' top ten holdings. Percent.

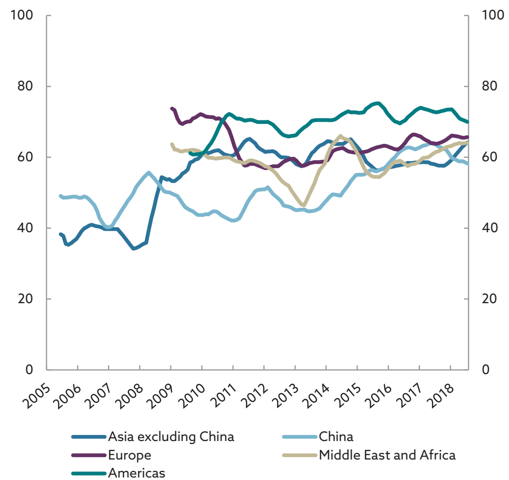


Chart 43 Emerging markets mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

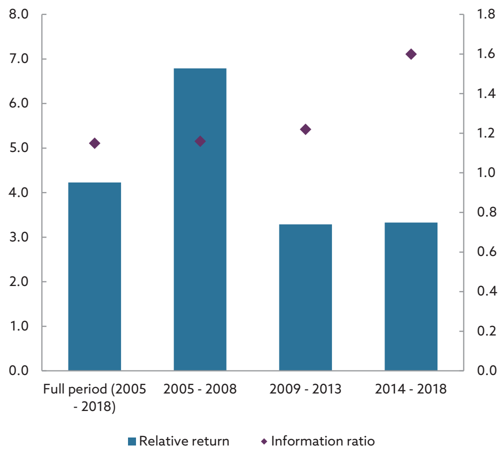


Chart 44 Emerging markets mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

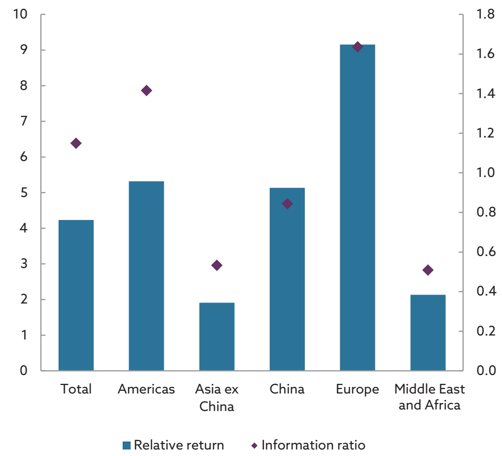


Chart 45 Emerging markets mandates. Annualised relative return in percent (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate

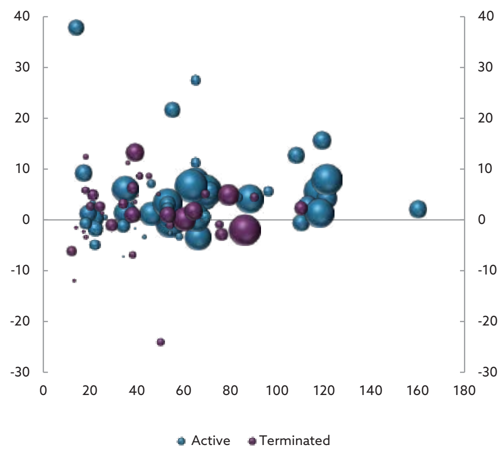
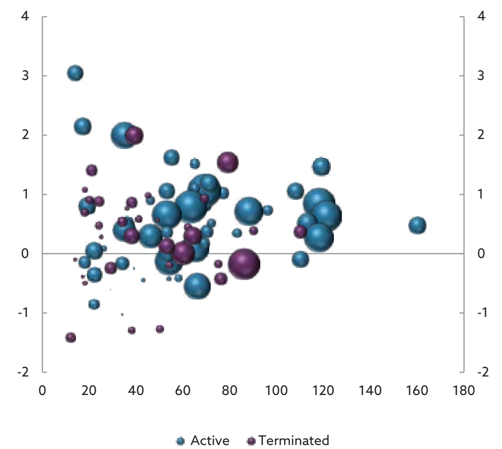


Chart 46 Emerging markets mandates. Annualised information ratio (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate



Small-cap mandates 2001-

Our managers with small-cap mandates invest in small companies in developed markets. All the managers are locally based, concentrate on one market and have in-depth knowledge of the companies concerned.

Our first managers investing in small companies in certain regions were selected in 2001. Since then, we have had three different categories of small-cap mandates. The first was more opportunistic, as we identified good managers focusing on small caps when we were looking for regional managers.

The second category of mandates was initiated in 2008, with a specific search for small-cap managers in countries where we wanted more diversified exposure to take advantage of the fund's long-term investment horizon. The third category started after the European debt crisis in 2010, when we saw opportunities for finding good companies in the less efficient small-cap segment as companies were indiscriminately sold down.

The history

The first managers 2001-2004

During our search for regional managers in Japan, Asia-Pacific excluding Japan, the UK and Europe excluding UK, we identified a few exceptional portfolio managers who were concentrating on small-cap companies. We conducted thorough analyses and determined that we would fund these dedicated small-cap managers. The mandates awarded were Nordic small caps, UK small caps, Japan small caps, Asia-Pacific ex Japan small caps, and Europe ex UK small caps.

In 2001, the fund's benchmark only included mid- and large-cap companies, and the mandates were funded by reducing the same regional exposure in the internal index portfolio. The result was that the fund's total exposure to different regions remained unchanged, but the actual investments had a lower average market capitalisation than the fund's benchmark. The managers' performance was measured against a small-cap benchmark. We performed extensive monitoring of sector deviation and company-specific issues in the portfolios, not only versus the small-cap benchmark they were measured against, but also versus the fund's benchmark.

Expanding the universe 2005-2009

In 2005, we decided to expand the search for specialist small-cap managers. The decision was underpinned by the belief that the fund's size and long-term investment horizon warranted diversification across size in different markets. We had also begun analysis of a potential

extension of the fund's strategic benchmark to include small-cap companies. This analysis found that there were several markets where the fund could benefit from greater exposure to the many smaller companies.

We decided to concentrate on Europe and Asia. The US market had the largest coverage by analysts across the full spectrum of small-, mid- and large-cap companies, and we assumed it would be more difficult to find opportunities with attractive expected returns in that market. Furthermore, given the large number of managers focusing on the segment, it would be more difficult to identify the managers who stood out from the rest.

Based on recommendations from, among others, Norges Bank in October 2006, and following a debate in the Norwegian Parliament, the Ministry of Finance decided in June 2007 to extend the composition of the fund's strategic benchmark index to include small-cap companies. The transition was carried out over a five-month period starting in 2007 and completed at the end of the first quarter of 2008.

In 2008, following the new mandate from the Ministry of Finance, we started a search for specialist small-cap managers in Japan, South Korea and Australia. These were countries dominated by large companies that attracted a lot of attention from market participants. We were looking for local specialist managers with an in-depth knowledge of smaller companies in order to gain better exposure to this segment than through internal indexing.
One challenge we ran into when we first established these mandates was finding specialists in single-country markets. Many small-cap managers invested in a larger geographical area, such as all of Asia, or at least neighbouring countries, and these were also the most common products purchased by other institutional investors. Our focus was on finding managers who knew the companies in their home market exceptionally well and analysed companies in other countries with a view to knowing the competition, not as potential investments.

In Japan and South Korea, where the small-cap segment was larger and more diversified, several asset management firms used the small-cap arena as a training ground for new portfolio managers. The aim was for them to manage a larger part of the market as they became more experienced. Therefore, the number of portfolio managers concentrating on small caps their entire career was significantly lower than the number of small-cap products available.

At the end of 2009, we had selected three small-cap managers in Japan, one in South Korea and one in Australia. The managers were measured and paid according to their outperformance of a benchmark with a similar market capitalisation.

The European debt crisis 2010-2014

On 19 October 2009, the Greek government doubled its forecast for the budget deficit that year to 12.5 percent. Three days later, the credit rating agency Fitch downgraded Greek debt. This marked the start of the European debt crisis. Over the following years, the European markets were shaky and the market environment dampened investors' risk appetite, triggering declines in most sectors.

After the start of the crisis, in the spring of 2010, we started looking for small-cap specialists in several European countries. The reasons were threefold. First, we wanted specialists who could avoid companies in the benchmark with exposure to the crisis. Second, as the small-cap

segment was less efficient than the large-cap segment, due to less focus from market participants, we could get exposure to companies that were attractively priced. Third, we saw good opportunities in these markets, as the financial crisis resulted in an indiscriminate sell-off.

In 2010, we conducted a search in Greece which ended in November when we selected an asset manager based in Athens. As the situation in the country became more unstable, however, the manager recommended that we withdrew our money, and we terminated the mandate in September 2011. We continued to review the market. A few years later, when the situation in Greece had improved, the same manager was again awarded a mandate.

We awarded a total of five new mandates in Europe in 2010 – in Italy, the UK, Spain, Sweden and Greece. In 2011, we awarded mandates in Belgium, France and Germany. Further mandates in Sweden were added in 2013. In total, we awarded 11 new mandates from 2010 to 2014 and terminated six.

We increased funding for European managers by 6 billion kroner in 2010, 5 billion kroner in 2011 and 2 billion kroner in 2013. We reduced the mandates by 2 billion kroner in 2011 and 3 billion kroner in 2013. At the end of 2014, we had six small-cap managers in Europe with 20 billion kroner under management.

Expansion and consolidation 2015-2018

Entering 2015, we had European small-cap managers in France, Germany, Italy, Sweden and the UK. In addition, we had Asia-Pacific small-cap managers in Australia, Japan and South Korea. From 2015 to 2018, we expanded the strategy, actively searching for new small-cap managers in some of the larger developed Asia-Pacific countries, including Japan, South Korea and Australia, as well as selected southern European countries. We awarded mandates where we perceived the opportunities for active management to be good. During this time, we awarded 12 new small-cap mandates, of which seven were in Europe and five in Asia-Pacific. This included one new manager in New Zealand where we had previously not been present.

In 2018, we consolidated our small-cap focus, terminating four mandates, including our mandate in Germany, due to either organisational changes or lack of conviction in the manager, and awarded two new mandates. Overall exposure was relatively unchanged from 2015 to 2018. By the end of 2018, we had 35 billion kroner with managers in Asia-Pacific and 25 billion kroner with managers in Europe.

The challenges

Country exposure

Investing in a country's equity index is not necessarily the same as investing in the country's economy. Some country indices are dominated by a few large companies with a more global outlook. Other indices may be dominated by only a few investable companies. Expanding our investment universe to include small-cap companies in developed markets makes the fund more diversified and gives better exposure to a country's economy.

One differentiating feature of the small-cap universe is the sector composition. A large part of the investment universe is in the industrial sector. These are companies generally more exposed to domestic revenue, as they are in the business of providing industrial goods and services and construction and materials, including civil engineering, electronic equipment, industrial engineering and industrial transport, such as railways and shipping.

Another part of the investment universe is consumer services – companies in retail, media, travel and leisure. These companies are predominantly linked to consumer spending in the domestic markets where they are located. This is also the case for the financial sector, including banks, insurance and real estate investment and services, as well as consumer goods, such as cars, food and drink, and personal and household goods.

This means that the universe of small companies generally has greater exposure to domestic revenue than large caps, while large caps have greater exposure to international revenue than small and mid caps. Managers who understand the drivers in the local economy have an advantage when it comes to understanding the revenue drivers of smaller companies. Furthermore, by allocating funds to mid- and small-cap managers rather than all-cap managers, we would avoid paying fees for active management of the large, dominant companies in the benchmark. We wanted to focus our resources on the part of the market where we believed the likelihood of excess return was higher and the need for specialist knowledge and skills was important. We would furthermore not invest with small-cap managers in all markets, but only allocate assets to external active managers if we determined that the expected return after fees was favourable.

Information barriers

The fund has the structural advantage of having no fixed liabilities and a long-term focus. We are therefore better placed to pursue small-cap strategies than many other investors. When looking for managers in this segment, we have taken into consideration the differentiating features of the small-cap universe: the companies' local market exposure, their characteristic ownership structure, and the importance of local information.

For example, small companies are typically less covered by analysts and the media, and index providers generally leave out a large part of the actual investable universe when constructing small-cap indices. There are an average of two to three analysts following each of the 900 small-cap companies in Continental Europe, while more than 20 analysts follow each of the 94 largest companies. In France and Italy, there are only two analysts following each small-cap, while 21 follow each of the largest companies in the same countries.

There is a similar picture in Japan. There is on average only one analyst following each of the 1,327 small-cap companies, while 16 follow each of the 48 largest companies. In addition, it is common for each of the small-cap analysts to follow more companies than the large-cap analysts do. This often leads to them following a varied set of companies, which in turn leads to less knowledge about each one's drivers. The implementation of MiFID II seems to have further contributed to a reduction in analyst coverage. Furthermore, the less liquid a stock is, within the same segment, the less coverage it will have, as the investment banks need clients in order to promote their ideas. The likely result is an increase in opportunities for investors in this segment to gain a research advantage. Low coverage and low liquidity may create pricing inefficiencies that an investor with our characteristics can use to its advantage.

The investor relations departments at small companies, if they have one at all, do not always distribute information very effectively to the global investor community. This means that information is often less transparent, and the information flow slower. The managers therefore need a deep understanding of the availability of local information, and an understanding of and access to both companies and their boards, as well as other stakeholders, such as customers, suppliers and competitors.

The small-cap managers we look for maintain close contact with companies in their portfolios, as well as companies not invested in, by visiting them throughout the year. In addition, they use their resources and experience to gather information from a number of other sources, which is more difficult for international investors to do as effectively. Knowledge of companies' products and services is of critical importance, as is an understanding of their customer base and other stakeholders. These managers aim to understand the companies' earnings potential, or lack thereof, before other investors, and construct portfolios based on their in-depth local knowledge and research. If their selection hypothesis is verified, the companies will be identified by larger investors, and coverage of the stocks will often be taken up by international brokers. Therefore, we have focused on identifying locally based managers with significant experience and knowledge of the local market.

Many small companies have a dominant large owner, or a family that owns a majority of the shares. In these cases, being invested alongside a majority shareholder that does not disadvantage minority shareholders requires not only a knowledge of the company and its governance structure, but also an understanding of the motives of the other main shareholders.

Furthermore, small companies often release information only in the local language, and not in English. Having local specialists who speak the language, understand the culture and frequently meet the majority shareholders is thus important for being invested in the right companies.

Good governance

Given the limited liquidity of small companies, good corporate governance is very important. First, it reduces the likelihood of being invested in a company that faces a governance incident, in which case liquidity frequently dries up. Second, it increases the likelihood of being invested in the right companies in a market that runs into indiscriminate liquidity issues. Finding local managers who pay attention to corporate governance and sustainable business models is therefore crucial. We discuss these issues in the regular meetings on-site with managers, to make sure that governance continues to be an integrated part of their assessment of new investment opportunities.

We limit ownership of a company in our portfolio to 3 percent, so that, if necessary, we can reduce our position with limited market impact costs. However, the total holdings managed by an asset manager for us and other investors combined will often be significantly higher. This means that the opportunity for active ownership with a real impact can at times be considerable.

Therefore, we carefully evaluate how asset managers exercise active ownership through dialogue, voting or other activities. A large shareholder has greater opportunities to ensure that management runs the company sustainably and to the benefit of investors, and a large shareholder can impact strategic change when required. The purpose of active ownership is to achieve the maximum benefits for investors. For example, we have seen changes in companies' board members resulting from our asset managers' positive governance actions.

The return

The small-cap mandates in developed markets have had an annualised return of 7.9 percent since inception in 2001. They have delivered an annualised excess return of 0.5 percent before fees with an information ratio for the combined mandates of 0.2 and an annualised excess performance after fees of a shade over 0.0 percent. All the small-cap mandates are measured against a benchmark with an average market capitalisation similar to their portfolio. For example, the Japan small-cap mandates are measured against the FTSE Japan Small Cap index.

Less consistency in returns

Our overall experience of investing with small-cap managers has been mixed. The most successful managers have applied an approach combining extensive management meeting activity and company analysis with a strong understanding of the drivers that may lead to dislocations between valuation and earnings potential. In many cases, the managers have been able to create positions in companies before the sell-side analysts have identified the opportunity and initiated coverage or upgraded their earnings estimates.

Managers with a consistent exposure to companies that have subsequently had their earnings estimates upgraded have created excess returns. When analysing the results, we find that managers who have consistently been able to identify positive earnings trends have significantly outperformed their benchmarks. On the other hand, a strategy's specific value or growth tilt or strict adherence to either has not been a good indicator of positive or negative excess returns.

Out of the 40 small-cap managers, 25 have outperformed the benchmark, while 15 have underperformed. The average annualised excess return before fees for the mandates that have outperformed is 3.1 percent, while the mandates that have underperformed have delivered an annualised average excess return of -5.0 percent.

Outperformance in falling markets

Small-cap managers have outperformed in 50 percent of the months they have been funded. Both European and Asia-Pacific managers have done better in down-market months than in up-market months. In down-markets, European managers have outperformed in 60 percent of months, and Asia-Pacific managers in 57 percent of months. The average portfolio return in up-market months has been 3.2 percent, on a par with the benchmark. In down-market months, the average portfolio return has been -3.3 percent, while the benchmark return has been -3.5 percent.

Table 10 Small-cap mandates. Number of outperforming and underperforming mandates

		Mandate relative performance	
Number of mandates	Total	Positive	Negative
Europe	**22**	**13**	**9**
Equal-weighted return, percent	-0.4	3.1	-5.3
Asia-Pacific	**18**	**12**	**6**
Equal-weighted return, percent	0.6	3.2	-4.6
Total	**40**	**25**	**15**
Equal-weighted, percent	0.1	3.1	-5.0

Better performance with more assets

Until the end of 2008, the fund had a modest allocation to developed markets small-cap mandates, with 4 billion kroner invested at the end of 2003 and 6 billion kroner at the end of 2008. The portfolio had an annualised return of 3.6 and 1.9 percent in 2001-2003 and 2004-2008 respectively, with an annualised excess return before fees of 0.6 and -0.2 percent. The impact on performance in kroner was therefore small. For the subsequent period from 2009 to 2013, the portfolio generated an annualised return of 19.3 percent and an annualised excess return before fees of 2.4 percent. Following the inclusion of small-cap companies in the fund's strategic benchmark, the allocation to developed markets small-cap mandates increased rapidly. The excess returns in this period were largely driven by a strong performance in the Asia-Pacific small-cap mandates. Although the European small-cap mandates delivered a negative excess return in the first half of this period, they recovered significantly in 2012 and contributed positively to the results for the period.

In the last sub-period from 2014 to 2018, the portfolio returned an annualised 5.2 percent, delivering an annualised excess return of -0.7

Table 11 Small-cap mandates. Share of months with positive relative return. Percent

Share of months positive return	Months outperforming	Portfolio return	Benchmark return
Europe	**55**		
Up-market months	51	4.0	4.0
Down-market months	60	-3.6	-3.7
Asia-Pacific	**48**		
Up-market months	42	3.3	3.5
Down-market months	57	-3.0	-3.3
Total	**50**		
Up-market months	47	3.2	3.2
Down-market months	53	-3.3	-3.5

Table 12 Small-cap mandates. Time-, asset- and equal-weighted relative returns. Percent

Relative return	Time-weighted	Asset-weighted	Equal-weighted
Europe	0.6	0.5	-0.4
Asia-Pacific	0.1	1.1	0.6
Total	**0.5**	**0.8**	**0.1**

percent before fees. The negative excess return in the first half of the period was driven by significant underperformance by the Japanese small-cap mandates. These mandates underperformed from the end of 2013 until the end of 2016, but have since recovered and contributed positively to the excess return on developed markets small-cap mandates. The European mandates continued to outperform until the end of 2017, but a less positive year in 2018 erased some of the former gains, and the European mandates are now at 0.6 percent annualised excess performance.

We do not see the disappointing results in Europe in 2018 as an indicator of potential in the segment. On the contrary, the future potential for local managers to find companies with attractive returns in Europe has probably increased, as the market is experiencing less coverage by sell-side analysts and large institutional investors.

The asset-weighted excess return before fees, meaning the monthly portfolio returns weighted by monthly assets under management, has been an annualised 0.8 percent, compared with a time-weighted annualised excess return of 0.5 percent. The higher return generated with more assets under management has mainly been driven by the mandates in Asia-Pacific.

The equal-weighted relative return has been an annualised 0.6 percent in Asia-Pacific and -0.4 percent in Europe, meaning that we have allocated more to the managers who subsequently had the better performance in Asia-Pacific, but not in Europe.

Chart 47 Small-cap mandates. Market value since inception. Billion kroner

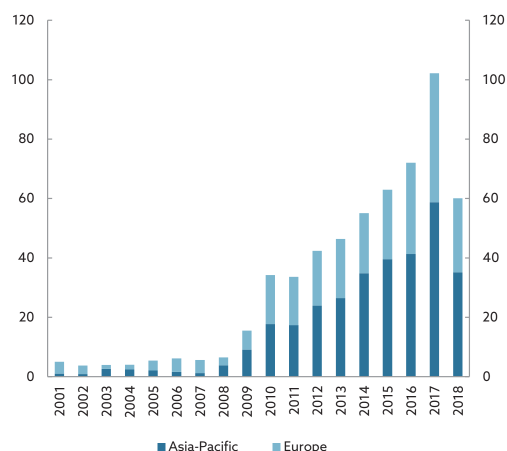


Chart 48 Small-cap mandates. Number of mandates by region

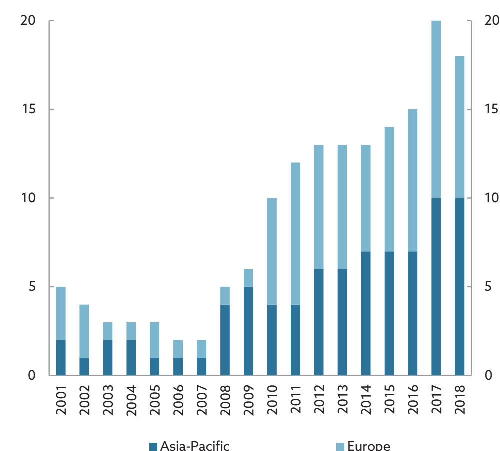


Chart 49 Small-cap mandates. Percentage of benchmark companies in the portfolio

Chart 50 Small-cap mandates. Average number of companies in the portfolio

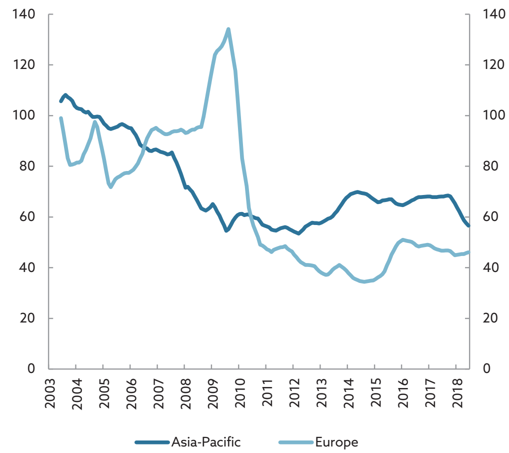


Chart 51 Small-cap mandates. Active share over time

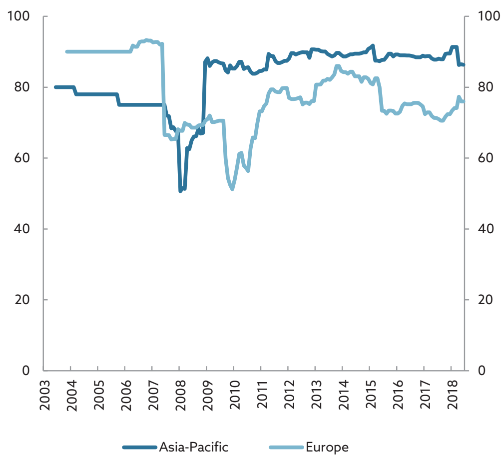


Chart 52 Small-cap mandates. Average share of managers' top ten holdings. Percent

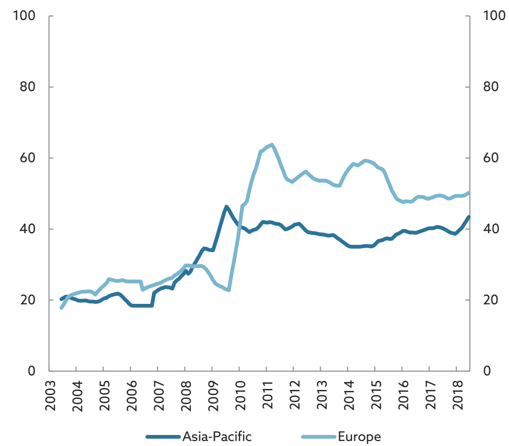


Chart 53 Small-cap mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

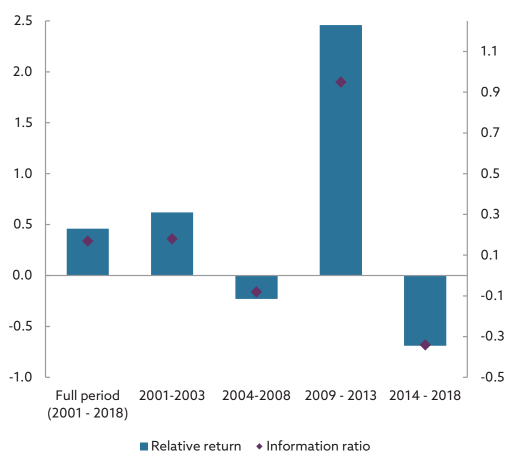


Chart 54 Small-cap mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

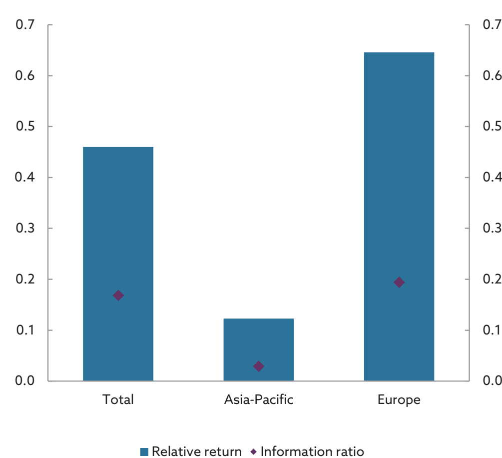


Chart 55 Small-cap mandates. Annualised relative return in percent (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate

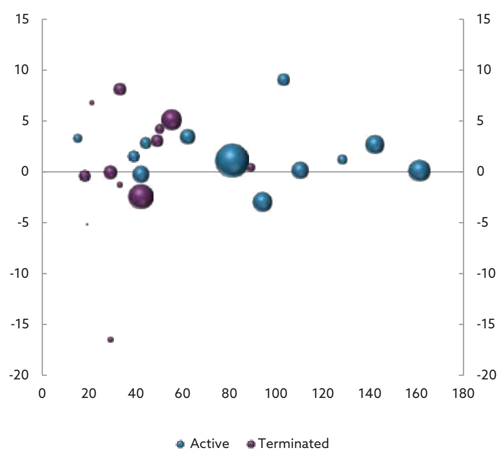
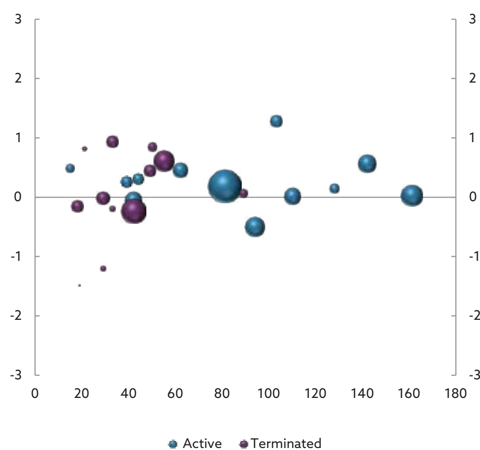


Chart 56 Small-cap mandates. Annualised information ratio (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate



Environmental mandates 2009-2018

The managers of our environmental mandates invested 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 2009. These mandates can be divided into three categories: low-emission energy, such as companies that produce renewable energy or develop equipment for doing so; natural resource management, consisting of mandates in water management, such as investments in companies that develop technology for improving water quality or infrastructure for treating and distributing water; and other environmental technologies, such as those that may help improve energy consumption or limit harmful emissions.

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

The characteristics of the universe mean that it is an area that is particularly suitable for active investment. Deep analytical resources need to be deployed to avoid disadvantaged companies while uncovering disruptors and winners.

The history

The first mandates 2009-2010

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 or developing markets. The topic was made part of the public consultation on the ethical guidelines in 2008. At the end of 2009, we awarded our first two external environmental mandates, focusing on clean power production and water management, with a combined allocation of 2 billion kroner. They were awarded while there was still an ongoing discussion about the overall role of environment-related mandates in the fund and built on our experience with sector mandates. Starting from our existing utility sector mandates, we began looking for managers who were specialists in green utilities, namely low-emission energy production and water management.

The first mandates took our work on the expectation documents on water management and climate change as their starting point. These themes have been core topics for the fund for more than a decade, and we published our first expectation documents on the topics in 2009 and 2010. Water challenges 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.

By the end of 2009, we had identified 36 asset managers specialising in water management, low-emission energy and clean technologies. We met most of these to find new portfolio managers with specialist expertise in such mandates. The aim of the search, which ran into 2010, was to find asset managers that had either started to build portfolios with an environmental focus or that we believed had the right people to build such a portfolio.

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.

In 2010, five new mandates were established in low-emission energy, water management, Japanese smart grid technology and clean technology. In addition, 3 billion kroner was allocated to existing low-emission energy and water management mandates. Consequently, the market value of the fund's external environment-related investments increased to 11 billion kroner at the end of 2010.

Increased allocation 2011-2018

From 1 January 2011, the fund's mandate was revised to include specific reporting requirements for the environment-related investments. A new mandate for clean technologies was awarded during the year, and the market value of the eight external mandates ended 2011 at 9 billion kroner.

Environment-related investments were included as a requirement in the mandate for the fund from 29 June 2012. At that time, the interval was set at between 20 and 30 billion kroner. The investments in the external portfolio had a market value of 13 billion at the end of 2012, concentrated mainly in low-emission energy and clean technology. 2013 saw the termination of two mandates in low-emission energy, and the Japanese smart grid portfolio was moved out of the environmental portfolio and reclassified as a Japanese mid-cap portfolio to better capture all opportunities in the Japanese mid-cap space. In 2014, a new mandate in clean technology was established.

The interval for environment-related investments from the Ministry of Finance was increased to between 30 and 50 billion kroner from 1 January 2015, and to between 30 and 60 billion kroner from 29 September 2015.

As environment-related investments were a growing and immature field, it was important for us to know at all times who was developing specialist expertise in the area. As a part of our search, we attended industry conferences with a focus on environmentally themed investments, where we talked to other participants to gain an impression of who might have the expertise required in this field.

The challenge in selecting external managers for such investments has primarily been the limited universe of investment managers dedicated to this niche segment. We found the majority of established products to be based on a thematic allocation or negative screening philosophy. We, however, saw individual research on each company held in the portfolio as a fundamental criterion. Our strategy has therefore been to uncover specialist portfolio managers and obtain a customised strategy.

Due to the increase in the allocation interval in 2015, two new mandates were established

within low-emission energy, one for renewable energy and one for clean technology. One mandate in water management was terminated, and two mandates, for water and clean technology, were defunded. The market value at the end of 2015 was 19 billion kroner. One mandate for low-emission energy was terminated in January 2017, while the mandates for energy efficiency and water management were allocated more assets. The market value of the fund's external environmental mandates was 22 billion kroner at the end of 2017.

Our environmental mandates have been split between different managers, each with specialist knowledge of a particular segment of the investment space. The external mandates have focused on small-cap companies. These companies tend to be less known, with limited research coverage by investment banks, creating information-related dislocations that our experts could exploit.

To achieve diversified exposure across the opportunity set, we sought complementary external portfolios. Out of the 150-200 investments in the aggregate environmental portfolio at any one time, only 30 percent of the companies were included in two or more of the external managers' portfolios, indicating that the individual managers did not overlap in their research. We wanted the external specialists to identify the best investment opportunities globally, irrespective of the index. The managers had considerable research capacity to monitor regulatory changes and disruptive technology trends in order to identify the companies with the services and products of the future.

At inception in December 2009, the mandates were funded in the same way as other actively managed equity mandates, using relevant sectors to reflect the underlying market for the mandates. This means that the external environmental mandates were funded by selling internal investments within the alternative energy index or water index, the same sectors as specified in the external benchmarks.

The funding for new mandates changed from sector-level equities to global equities in April 2012. By 2013, this new funding structure was applied to most of the existing mandates as well. This means that investments were funded by selling global equities as part of the FTSE Global Index. This gave the investments more allocation-type characteristics.

In December 2016, further changes were made to the funding of the mandates. The purpose was to reduce the exposure to the utility sector stemming from the aggregate allocation to environment-related investments.
Gradually, funding was adapted to be better aligned with the investment opportunities in these mandates. This meant that the mandates were funded by selling more US equities, as US companies constituted a large part of our environmental investments. Furthermore, only companies in basic materials, consumer goods, industrials, oil and gas, technology and utilities were sold to fund the mandates, as these were part of the managers' benchmarks, while financials, health care, telecoms and consumer services were not.

The main objective of the mandates was a financial return. This was not only written into the managers' investment guidelines, but also made visible through performance-based fee schedules, which all managers had until March 2017. As they were measured against a global index, however, the environmental mandates had a substantial allocation element, making it difficult to construct a relevant benchmark. The allocation element led us to change the fee

schedule for these mandates. From April 2017, all managers bar one were paid fixed fees.

Termination in 2018

Starting in 2009, we awarded 11 different environmental mandates. Our external investments were complementary to our internal investments in terms of investment emphasis and exposure. The external mandates had a larger portion of companies in emerging markets, small caps and clean technologies.

In 2018, we decided to terminate all external environmental mandates. There were three main reasons behind this decision. First, the mandates were in an area that is hard to measure, as there is no good benchmark. Second, the investments were a dual strategy with both internal and external mandates, capitalising on different opportunity sets within the environmental universe, and Norges Bank Investment Management wanted to use its internal capabilities. Third, terminating the external environmental mandates enabled us to focus our resources and budget for external managers on specialist country mandates.

The challenges

Opportunities over time

The Ministry of Finance's Report No. 20 (2008-2009) stated that investments under the environmental 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."

Our investments were thus to be in solutions rather than a strictly defined market sector. The segment is a poorly defined universe faced with an ever-changing opportunity set of disruptive technologies, new market entrants and unpredictable policy frameworks. In 2009, there were not many market participants specialising in investing in this universe. Few asset managers had tried to define environmental investments, and we were entering uncharted territory by aiming to invest with external managers who had, or could build, expertise in this universe.

As the allocation to the universe grew and new companies developed, we observed that there were not many "pure-play" environmental companies with a single business focus. Together with the fact that there was no clear-cut definition of the universe, these two characteristics meant that the investable market capitalisation of pure-play environmental companies was small. Conglomerates often had more capital and resources to develop and implement new solutions. It was only possible to buy shares in the whole conglomerate and not just the part which could be deemed environment-related.

How large the environmental side of the conglomerate needed to be before an investment was justified was a matter of subjective judgement. In 2016, we set a

minimum level of environmental exposure for a company to be eligible for investment, and the main objective for the investments was defined as follows: "The investments will focus on solution providers that yield indisputable environmental benefits. Investments shall be in renewable and alternative energy, energy efficiency, water infrastructure and technologies, pollution control, waste management and technologies. Companies must derive at least 20 percent of their business from the above sectors to qualify for investment."

In 2017, the threshold was raised such that "companies must derive at least 50 percent of their business from the above sectors to qualify for investment." Although the majority of the investments were in pure-play environmental companies, the 50 percent exposure requirement allowed for investments in multi-industry companies and conglomerates with growing environmental exposure.

Indexing not an option

For the first environmental mandates in 2009, the main objective was to outperform the benchmark in a controlled manner through stock selection. The benchmark was specified as the FTSE Alternative Energy and FTSE Water Utilities indices. From 2010, we reduced the benchmark weighting for a selected number of companies by halving the weight of companies that made up a large portion of the specific sectors. In 2011, the benchmark was changed to selected companies in the FTSE Global weighted by market capitalisation. The companies selected were those in a sub-sector related to the particular mandate. As an example, the manager running a global water mandate was benchmarked against company names related to water utilities with reduced benchmark weights for two of the largest companies.

The environmental benchmark was at that time quite narrow. In 2012 and 2013, the benchmark was changed to the FTSE Global All Cap for most mandates. The benchmark should be seen as a hurdle rate, not as a universe defined by an index provider. The main objective for the mandates was changed to delivering a high absolute return in a controlled manner through stock selection in areas with a focus on solution providers. Investments were to be mainly in "clean and renewable energy, technology or infrastructure which improves or contributes to energy efficiency or quality of water, reductions in environmentally harmful emissions, waste management or energy-efficient buildings or transportation." It was also specified that the managers should not invest in three sectors: oil and gas, industrial metals and mining.

From 2015, both the benchmark and the main objective were more closely aligned across all the external mandates. Until then, there had been some variations and customisation in the descriptions of the different mandates, depending on their focus. In 2015, it was specified that "investments will focus on solution providers that yield indisputable environmental benefits such as clean and renewable energy, energy storage and efficiency, low-carbon transportation, waste management and water-related products and services."

We came to the realisation that these mandates required an even stricter exclusionary definition, given the directive to yield net positive benefits. In addition to positive selection within sectors and the overall ethical exclusions from the fund, the external mandates were prohibited from investing in potentially harmful sectors. Thirteen sectors as categorised by the index provider FTSE were therefore excluded from the investment universe in 2015, resulting in the barring of over 800 companies. These

companies operated in sectors such as oil and gas exploration and production, metals and mining, and conventional utilities.

At the same time, the benchmark was changed for all mandates to a customised FTSE Global All Cap, with the exception of one manager who had the WilderHill New Energy Global Innovation Index as benchmark. The customised FTSE Global All Cap had a larger weight in the US, as many of the companies with environmental products and services were located there. Four sectors were excluded from the benchmark: financials, health care, telecoms and consumer services. This followed the same rationale as before: the benchmark was just a hurdle rate to beat, but now a more targeted hurdle rate, as the sectors excluded were very different to environment-related investments.

In 2016, the main objective was expanded to include an additional clarification: "The investments shall be fossil free and low carbon."

Managing environmental exposure

As part of our monitoring, it was important for us to keep close track of the environmental exposure of all companies in the external environmental mandates, and of the sustainability and governance risks associated with these companies. On a quarterly basis, managers had to present in detail the environmental case for including each company in the portfolio.

In addition, they had to outline sustainability and governance issues for all companies and describe any exposure to sectors such as coal, oil and nuclear, including as a percentage of total revenue, capital expenditure and energy generation. The objective was to gather input on the environmental exposure of the companies in each portfolio. This input was used in our overview of the exposure of each company in our universe. Additionally, it was used as a check on our minimum 50 percent environmental revenue exposure requirement.

From 2015, we also kept track of the carbon footprint of all of the environmental portfolios and their constituent companies. This was benchmarked against the stocks we sold to fund the portfolios and the FTSE Environmental Opportunities All-Share Index. In 2018, the external environmental portfolios had total emissions of 2.9 million tonnes of CO_2-equivalents, as measured by scope 1 and 2 emissions. This can be compared to 8.7 and 5.0 million tonnes of CO_2-equivalents for the funding and the FTSE index respectively.

The return
The external environmental mandates had an annualised absolute return of 3.4 percent before fees over their lifespan from 2009 to 2018. This return was volatile, ranging from -20.6 percent in 2011 to 38.4 percent in 2013. The annualised excess return over the whole period was 2.5 percent before fees and 2.1 percent after fees, measured against the benchmark. The annualised relative return was 7.4 percent before fees for the sub-period 2009-2013 and -2.5 percent before fees for the sub-period 2014-2018.

The mandates combined had an information ratio of 0.5.

Variable returns
The environmental investment universe is still nascent and sensitive to the development of new technologies, business models and government regulation. A relatively small group of companies such as this is expected to show greater return volatility over time than the broader equity market, and the portfolio and universe were indeed more volatile than the broader equity market. The mandates had a standard deviation of 12.9 percent for the period 2009 to 2018. This is higher than that of the fund's broader equity portfolio.

The investment universe of listed companies in natural resource management was immature when the fund started searching for such managers. Mandates in areas where a significant part of the broader opportunity set was accessible in the listed market performed well. For mandates in low-emission energy and other environmental technologies, the opportunity set was broad enough for managers to shift between types of technology and solution providers as relative valuations changed.

Over the environmental strategy's lifespan, there were several rotations in exposure to different sub-sets of the opportunity set as relative valuations changed with investment trends, changes in regulation and subsidies, and the development of new disruptive technology and solutions.

We found that the managers who put more effort into conducting internal research directly outperformed those who relied on third-party research for valuation and idea generation.

Mandates in areas where the broader opportunity set in the market was either dominated by unlisted investment opportunities, or where environment-related investments were only a smaller part of the investable businesses' operations, were not able to convert specialist knowledge into excess returns to the same degree.

Avoiding inflated valuations
The low-emission mandates, consisting of mandates in clean energy and renewable energy, delivered an annualised excess return of 5.2 percent before fees. The information ratio was 0.6.

Other environmental technologies, consisting of investments in clean technology that may help improve energy consumption or limit harmful emissions, produced an annualised excess return of 2.7 percent before fees. The information ratio was 0.4.

A significant part of the excess returns created in the period came from the managers identifying moments of inflated valuations in technology, solar and wind due to changes in the regulatory environment, underlying business models or surges in popularity for this type of investment leading to a dislocation between the valuation of

the companies and their fundamental earnings potential. For example, when solar and wind became overpriced, our managers sold these assets, shifting their exposure to other parts of the environmental universe, such as battery technology or subcontractors delivering parts or technology to the solution providers. The ability to identify price dislocations and position the portfolio came in large part from a deeper understanding of the dynamics and development of the cost curve for wind and solar technology, as well as active on-the-ground research to identify the next disruptive technology or method for developing more efficient environmental solutions.

The natural resources mandates, consisting of mandates in water management, produced an annualised relative return of -1.1 percent before fees. The information ratio was -0.2.

In water management, many of the investment opportunities were concentrated in utilities, water rights and unlisted companies, with only a smaller part of the opportunities in listed assets. In the listed space, many of the opportunities were large industrial conglomerates where only a part of the business was in the relevant focus area, making it more difficult to capitalise on specialist knowledge about the renewable part of the business..

Outperformance in falling markets

A total of seven mandates outperformed, while four underperformed. The average annualised relative return was 7.5 percent for the outperforming mandates and -6.2 percent for the mandates that underperformed. The portfolio managers outperformed in 54 percent of the months they were funded. In up-markets, they outperformed in 47 percent of months; in down-markets, 64 percent of months. The average portfolio return in up-market months was 2.9 percent, while the benchmark return was 3.1 percent. In down-market months, the average portfolio return was -3.2 percent, while the benchmark return was -3.9 percent.

Higher return with lower funding

The annualised asset-weighted excess return was 1.4 percent, which is lower than the annualised time-weighted return of 2.5 percent, meaning that we saw a better relative performance when funding for the mandates was lower.

The annualised equal-weighted relative return was 2.9 percent, more than the time-weighted excess return of 2.5 percent, meaning that we allocated more to managers who subsequently performed less well.

Table 13 Environmental mandates. Number of outperforming and underperforming mandates

Number of mandates	Total	Mandate relative performance Positive	Negative
Low-emission energy	**4**	**3**	**1**
Equal-weighted return, percent	3.8	9.8	-14.1
Natural resource management	**2**	**1**	**1**
Equal-weighted return, percent	-2.4	0.1	-4.9
Other environmental technologies	**5**	**3**	**2**
Equal-weighted return, percent	3.4	7.7	-2.9
Total	**11**	**7**	**4**
Equal-weighted return, percent	2.5	7.5	-6.2

Table 14 Environmental mandates. Share of months with positive relative return. Percent

Share of months with positive return	Months outperforming	Portfolio return	Benchmark return
Low-emission energy	**56**		
Up-market months	49	2.8	3.1
Down-market months	67	-3.9	-5.4
Natural resource management	**51**		
Up-market months	49	2.2	2.5
Down-market months	55	-1.8	-2.2
Other environmental technologies	**56**		
Up-market months	48	2.9	3.2
Down-market months	67	-2.8	-3.7
Total	**54**		
Up-market months	47	2.9	3.1
Down-market months	64	-3.2	-3.9

Table 15 Environmental mandates. Time-, asset- and equal-weighted relative returns. Percent

Relative return	Time-weighted	Asset-weighted	Equal-weighted
Low-emission energy	5.2	3.3	3.8
Natural resource management	-1.1	-2.1	-2.4
Other environmental technologies	2.6	1.0	4.7
Total	**2.5**	**1.4**	**2.9**

Chart 57 Environmental mandates. Market value since inception. Billion kroner

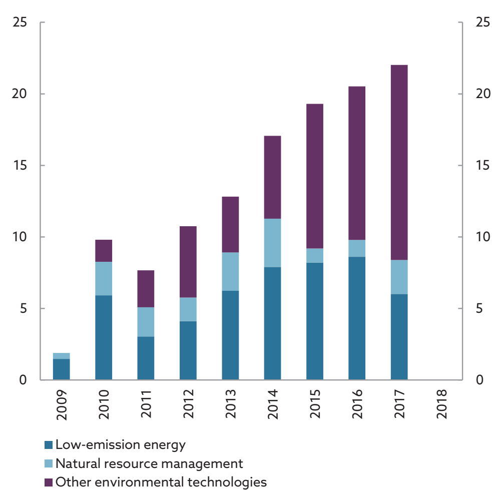


Chart 58 Environmental mandates. Number of mandates

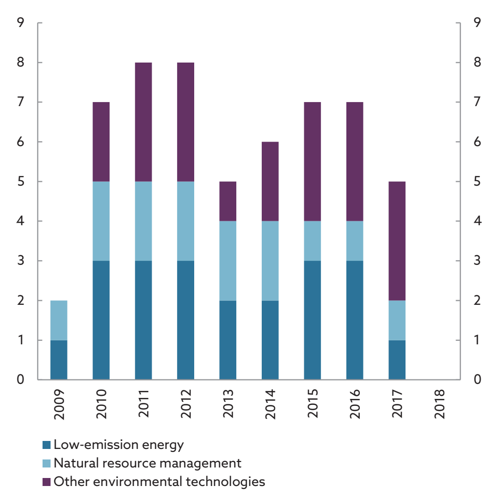


Chart 59 Environmental mandates. Percentage of benchmark companies in the portfolio

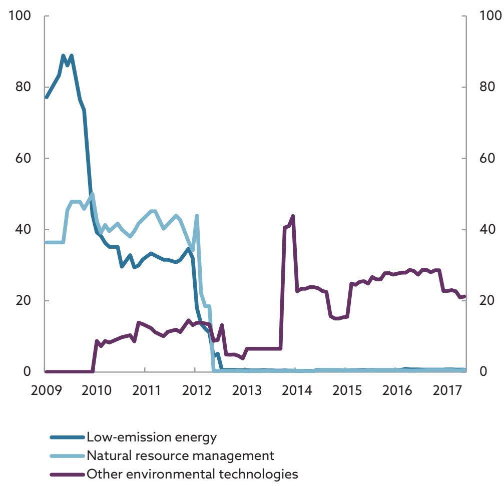


Chart 60 Environmental mandates. Average number of companies in portfolio

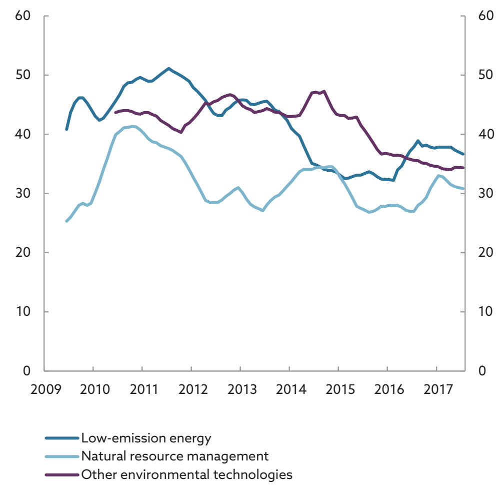


Chart 61 Environmental mandates. Active share over time

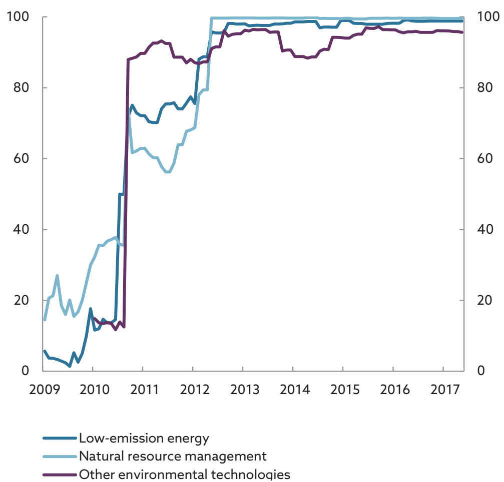


Chart 62 Environmental mandates. Average share of managers' top ten holdings. Percent

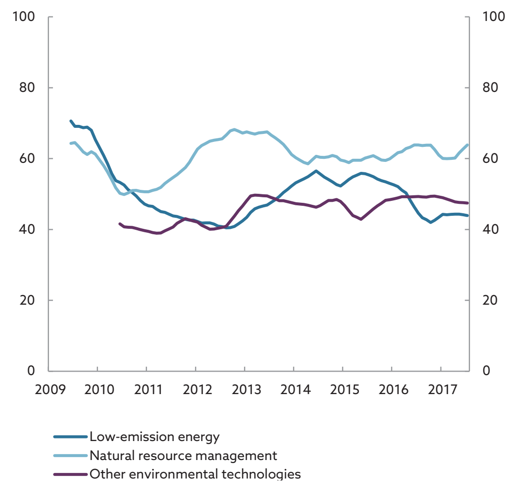


Chart 63 Environmental mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

Chart 64 Environmental mandates. Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

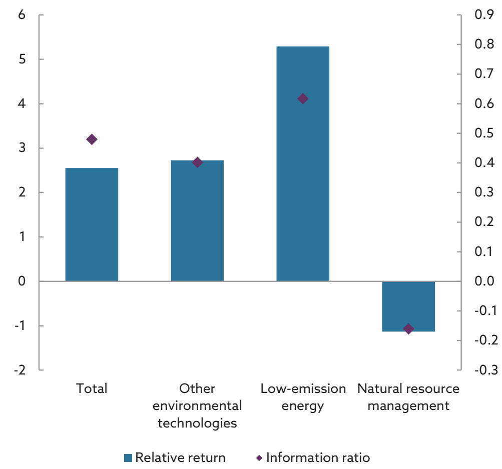


Chart 65 Environmental mandates. Annualised relative return in percent (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate

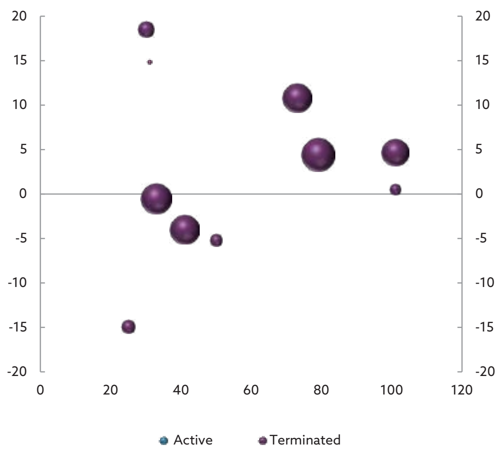
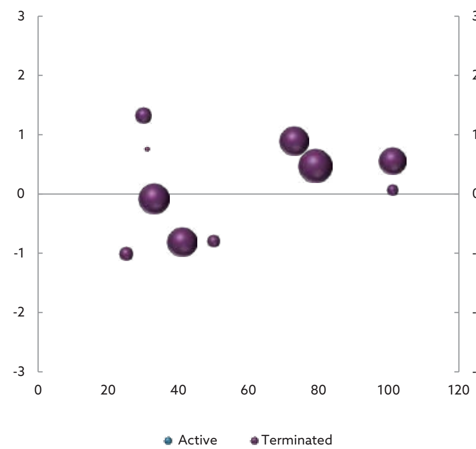


Chart 66 Environmental mandates.Annualised information ratio (y-axis) and months as manager (x-axis). Size of bubble indicates size of mandate



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The mandates

The internal portfolio managers in the external strategies team seek to identify what types of mandates to award, and which external managers to invest with.

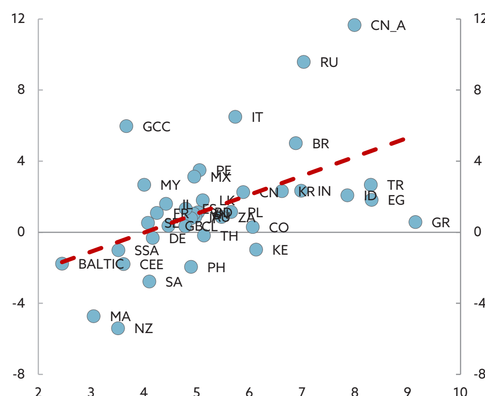
We are selective about which segments of the market we choose to invest in with external managers. Our preference is to focus on markets undergoing structural economic change, where information gathering and understanding are challenging. As this evolves over time, the types of mandates we have awarded have changed several times since we started, and we expect this to continue to change in the future as well.

Internal portfolio managers are responsible for selecting and monitoring external managers. Each is responsible for specific mandates and is supported by the team, as well as resources in the operations, legal and compliance departments.

Finding the potential
In our experience, market change and uncertainty create opportunities for highly skilled managers with in-depth fundamental research to outperform the average market participant. While many investors are resistant to change and prefer to wait for clarity before adjusting models and outlook, the better investors are able to manage information complexity by integrating new information in order to assess and adjust the probability of different outcomes. We have seen this with our portfolio managers in emerging markets and developed markets small-cap mandates. Those with mandates in more volatile markets have generated higher excess return than those in markets with less volatility. Our experience is that market uncertainty benefits investors who can efficiently gather and absorb new information and integrate it with existing knowledge.

Markets undergoing change have been our preferred areas for investing with external managers since the beginning. For instance, when we started the search for our first external active equity managers in autumn 1998, the euro was about to be introduced, with expected further integration of both product and capital markets. Various legal restrictions that had previously segmented pools of capital were about to be lifted. This was a fundamental structural change that was about to affect the entire continent. While it was quite clear to most market participants that the change would lead to some companies benefiting at the expense of

Chart 67 Average monthly volatility (x-axis) and annualised relative return (y-axis) for all emerging markets and small-cap managers since inception.



others, there was a great deal of uncertainty about who the winners would be and about how much the change would affect cashflows and what investors would be willing to pay for them. The potential for changes in valuations was considerable, and so also the potential for being rewarded for having better information and analysis. The ability to invest in the beneficiaries of the change across borders in Europe was important. As a consequence of this, we decided to organise our initial mandates as broad regional equity mandates.

Currently, there are several major structural trends and developments affecting the world. One example is China, a country that is rapidly developing from an economy driven by investment to a consumer society, while at the same time moving up the technology curve to become a global leader in many areas. With a more outward focus, China is investing abroad through programmes such as the Belt and Road Initiative, and building commercial bridges with other nations. We expect there will be beneficiaries of these trends both within China and around the world. Our emerging markets mandates have been designed with this in mind and are likely to remain an important mandate area for us in the near future.

We are seeing several technological advances that are affecting multiple segments of the economy. One major underlying driver of many of these changes is the progress that has been made in machine learning coupled with an explosion in the data available to analyse. For example, with Alex Krizhevsky and Geoff Hinton's breakthrough in FeiFei Li's ImageNet competition in 2012, it became obvious that the application of neural networks would be broad and effective enough both to create new businesses and to disrupt old ones. Neural networks are now affecting many sectors, usually behind the scenes, in for example fraud detection, e-commerce, advertising, process automation and video recommendations. There are likely to be companies that adapt and prosper as well as others that will wither. Given the high complexity of the field, the rapidly evolving technology and the need for differentiated information and analysis, specialist knowledge beyond the average market participant is needed. Several other technological breakthroughs are also taking shape, for instance with the decoding of the human genome finally resulting in the emergence of tangible pharmaceutical products. These technological disruptions and changes have led us to consider re-introducing industry-specific mandates.

Information challenges

We prefer to have mandates in market segments where gathering information is challenging and where there is a great deal of uncertainty that may be better assessed through additional research.

Language and local information are examples of barriers that prevent equal and rapid dissemination to all investors. When we entered emerging markets in the mid-2000s, we concluded that the optimal investment decision was to hire single-country managers. We expected that skilled local investors in emerging markets would benefit from lower language barriers, closer proximity to information sources and better knowledge of local regulations, customs and networks. With their knowledge of the local market and industry, they were also better able to put new information in context and could therefore develop an information edge. Similarly, certain developed markets, such as South Korea and Japan, present foreign investors with language barriers, including a writing system that is not based on the Latin alphabet.

Small companies appear less frequently in the news media and have less sell-side analyst coverage than larger companies. They also tend to have less developed investor relations departments. Information gathering and analysis is therefore more complex. This is somewhat offset by small companies tending to be simpler organisations to analyse, as they are more likely to have only a single business line. We nevertheless find that equity analysts willing and able to do proper fundamental research – including meeting suppliers, customers, management, unions and regulators – can more easily establish an information advantage when it comes to small companies than with larger companies.

Sell-side research is an important information source for many investors. As brokerage commission models have changed, so has the amount of money investment banks can make on their research, which in turn has led to a decline in sell-side analysts, from 4,400 globally in 2012 to 3,500 in 2019 for the 12 largest investment banks. The decline has been particularly acute in Europe following the introduction of MiFID II, which unbundled research payments from commissions. The decline in sell-side coverage has led the buy-side to increase investment in research, but the obvious difference is that while sell-side research is published, buy-side research is proprietary intellectual property. We believe that by investing with managers who perform high-quality proprietary research, we can generate excess returns in the future as well.

Active search

Before entering a new market, we conduct an assessment of market structure and the overall risks that are attached to the market. This includes an evaluation of market diversity, such as company sizes, market capitalisation and sector dispersion. For example, a small number of companies might dominate the market, or the market might be dominated by one particular sector such as basic materials or financials. Experience has shown us that our portfolio managers do best when there are a minimum of 60-80 realistic investment options across multiple sub-sectors to invest in. This allows for a concentrated portfolio while maintaining exposure to a variety of underlying cashflow drivers. For example, we have had higher excess returns in markets where benchmarks are least concentrated and where there is a broad spectrum of investable companies, including many not covered by the benchmark. We have seen the strongest results in the largest emerging markets, where 80 percent of our managers have outperformed and the median information ratio is 0.5. In medium-sized emerging markets, 74 percent of our managers have outperformed and the median information ratio is 0.2. In smaller emerging and frontier markets, 52 percent of our managers have outperformed and the median information ratio is 0.0. We experienced the same with sector managers, as we found that performance was lower for mandates with narrow benchmarks. Mandates with fewer than 85 companies in their benchmark underperformed, while those with more outperformed.

After the market assessment, we create a long-list of potential managers for the mandate. We have an open invitation to tender with no deadline for submission. On our public website we specify which mandates we are looking to fill. We receive numerous applications. All of these

are evaluated, but many are screened out because the asset managers apply for mandates that are not relevant or because they are from institutions that do not have the characteristics we are looking for. Most of our managers are found through our own active search process. As at the end of 2018, around nine out of ten selected managers had not contacted us through our website, but were found through our active search for managers.

A vital part of this active search in building the long-list is to collect input from a range of different sources. As the fund and our ownership of companies have grown, so has our access to market participants. Our access to local investment banks is a good source of information for gaining an overview of participants and respected analysts in the market. The investment banks often have first-hand information on potential new asset management firms launching in their market, job changes among portfolio managers and other information about participants that might be relevant. In addition to equity research sales, sales trading and equity proprietary trading, the prime-broker arms of the investment banks are useful for gathering information. We use this source both to build the list of potential managers and to be fully informed of changes in the investment manager landscape.

As a large fund manager, we have good access to investor relations personnel at companies the fund is invested in. These departments tend to have a good overview of which asset managers are present in the market, what coverage they have and their knowledge about the company. Our internal portfolio managers who select and monitor external managers will also attend local investor conferences, where a vital role is to gather information on which portfolio managers put good questions to the companies in smaller group sessions.

The portfolio managers in a market tend to know who their main competitors are and who does the most relevant research. We use this information source actively to expand the list of potential managers.

Another source that has been useful for finding potential managers for the long-list is the databases of shareholders put together by Bloomberg, FactSet, Refinitive and others from holding lists filed with local market regulators. These shareholder databases allow us to track which portfolio managers own which stocks, and have helped us find managers that do not feature on the typical list of asset managers. With access to these databases, we can also track changes over time and analyse manager behaviour, that is which managers come early or late to investment ideas. Managers clearly engaged in herding are also revealed through these databases.

We do not see historical performance as valuable information when selecting managers and spend no time analysing databases of historical returns. We hire managers because we believe their research and decision making will create good performance in the future, not because of the performance they have generated in the past.

The structure
The portfolio manager responsible for specific external mandates is part of an external strategies team that is responsible for selecting and monitoring external managers. The organisation has developed the resources and skills to support the external strategies team, both operationally and on the investment side.

This set-up has several elements. Operationally, a single global custodian, segregated accounts, an IT structure enabling internal databases for all transactions, and legal support with internally developed agreements have been instrumental for professional monitoring. On the investment side, our internal management of assets has allowed us to have a structure where we can fund managers in specific countries and sectors without taking on country and sector allocation positions as a result. This is done by reducing investments in the same areas internally, thereby maintaining overall balance. This has led to an ability to have customised mandates beyond what is common in the industry.

An internal trading team facilitating funding and defunding of managers has also been important. Combined, these features have facilitated the possibility of funding external managers in areas deemed optimal in terms of both expected excess return and the organisation's need for external expertise in a certain area. Each department is given a clear mandate for its tasks, which again has helped empower employees with decision-making responsibilities. This division of responsibility and clear accountability are a key success factor for the organisation as a whole, and for the team responsible for selecting and monitoring external managers.

The portfolio holdings

We seek to generate excess return by investing in the optimal portfolio of companies. External managers are selected and continuously reselected based on analyses of their portfolios.

By investing with external managers, we are investing in a set of companies. We analyse these portfolios across multiple variables, such as the portfolios' exposure to market opportunities, changes in sector exposure, liquidity profile, the weight invested in small companies, concentration in single companies and whether the companies in their portfolios have any common characteristics. Our focus is on the actual portfolio and changes in the investments over time. We build relevant analytical tools to analyse the portfolio from different angles. These analyses centre around concentration of holdings, avoiding consensus investments, portfolio construction, implementation, combining portfolios and trading.

All managers applying for a certain mandate provide, through our initial questionnaire, details of the relevant portfolio as at the most recent date they are legally and contractually allowed to release them, and six months and one year prior to that date. For the managers on the short-list, we do additional analyses of the portfolio based on three years of quarterly holdings, or a shorter period, if the manager does not have three years' history.

However, it is only after the investment decision has been made and the mandate is up and running that we have a live portfolio which we can monitor on a daily basis, as all transactions are settled through our global custodian and stored in internal databases. The analysis of holdings is used in interviews where we compare the asset manager's views and convictions with the portfolios we have analysed. We thereby dig deeper into the portfolio in the context of the qualitative information gathered. The quantitative analysis is iterative, meaning that we analyse data before the interview, and then perform additional analysis after each meeting as we get more information through the interviews. The interviews and analysis of the portfolios are used to verify or falsify our expectation for the portfolio managers' expected excess performance.

Portfolio concentration
The managers we invest with perform fundamental company research, by analysing reports from the company, discussing issues with management and regulators, and visiting factories and customers. We look for managers where this research leads to concentrated portfolios.

Calculated over the lifetime of each mandate, the average number of companies in our emerging markets portfolios and developed markets small-cap portfolios are 32 and 53 respectively, while the average weight of their ten largest holdings is 65 and 49 percent, respectively.

We view it as important that the managers' views and convictions are reflected in substantial allocations in their portfolios. This concentration of investments reduces governance risk as our managers will have evaluated the environmental, social and governance issues associated with the investment through detailed dialogue with management and stakeholders. It also reduces the probability of being invested in companies with elevated valuations, as our managers will have performed detailed financial analysis of the companies' cashflows and balance sheets.

We analyse portfolios and trades by comparing them with holdings across several different portfolios. The market tends to be segmented with different types of investors, such as institutional investors and retail funds, owning different companies. The reason may be that portfolio managers in different segments tend to use many of the same information sources, participate in the same conferences and have an eye on each other's performance and investments.

When we look for a manager with a non-consensus portfolio, we therefore look for a manager who has a portfolio that differs significantly from his or her peers. Assuming

Chart 68 Number of emerging markets and small-cap portfolios (y-axis) sorted by average number of companies in the portfolios (x-axis)

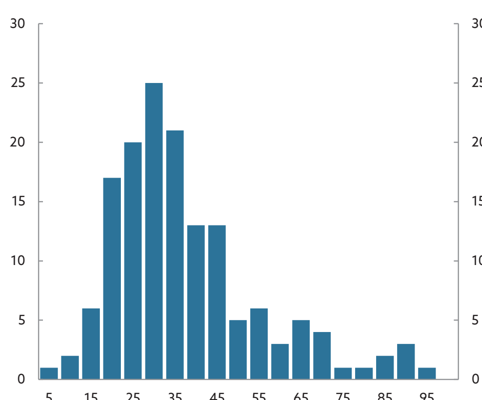
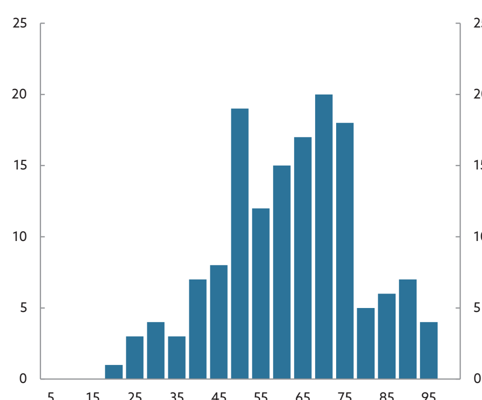


Chart 69 Number of emerging markets and small-cap portfolios (y-axis) sorted by average percentage weight of top ten companies in the portfolios (x-axis)



adequate processes, resources and skill, this may indicate that the manager bases investment decisions on in-depth company research as opposed to contacts with the exact same information sources as his or her peers.
We look for managers where both their strategic thinking and their historical portfolio tell the story of a manager who does not make portfolio changes in line with the market and at the same time as other market players. Historical portfolio data enable us to identify differentiating features of a manager's portfolio and identify how his or her views differ from the market and are implemented in the portfolio. We can also analyse whether actual trades tend to herd around times with higher market volumes or more media coverage of a company. There is a great deal of difference between buying a company before and after its business and potential become widely known. If a manager purchases the same securities as all his or her peers at the same time as them, it indicates that little proprietary research is being performed or that short-term market dynamics influence the management of the portfolio.

Portfolio construction
There are many aspects and factors a portfolio manager has to take into account when constructing a portfolio. We prefer managers to have high exposure to companies where they have a differentiated, well-researched investment case, but low exposure to systematic factors or companies outside core research. If an accurate forward-looking covariance matrix were readily available, this would be possible, as mean variance optimisation could be used to isolate company-specific exposures from systematic exposures. The problem is that such a covariance matrix is unobservable and has to be estimated with potentially significant estimation errors. With mean variance optimisers being highly sensitive to the quality of inputs, this means in practice that this approach is of little use for managing portfolios based on fundamental research. Most managers will therefore take a heuristic approach to weighting their best ideas into a portfolio. They will consider portfolio exposure to the likes of sectors, countries, betas and leverage, and will often assign companies according to these characteristics. This can be thought of as a form of pragmatic shrinkage of the covariance matrix into a manageable set of dimensions.

Our experience is that the best portfolio managers have a more comprehensive understanding of political, legislative and regulatory issues, unlisted competition and investor dynamics than historically optimised risk models are able to capture. The shrinkage method of focusing on sector, country, market beta and single-company exposure can therefore produce portfolios with well-understood characteristics for the manager.

We look for managers where the results of their in-depth company analysis are evident in their portfolio construction. This frequently leads to investing in portfolios that are different from the benchmark.

Calculated over the lifetime of each mandate, our portfolio managers with an emerging markets mandate or developed markets small-cap mandate are invested in only 27 and 19 percent respectively of the companies in their benchmark. Their active share, that is degree of deviation from the benchmark, is 67 and 78 percent respectively.

We look for consistency with the portfolio managers' investment decisions and beliefs and their actual and historical investment portfolio. It is important that the manager understands the investments and portfolio construction and has a good explanation for the weights and changes in the portfolio. The important part of the analysis is to see how the manager's investment and research influence the portfolio, and to verify that the manager has a firm understanding over time of which drivers in the economy the portfolio is exposed to.

Chart 70 Number of emerging markets and small-cap portfolios (y-axis) sorted by average percent of companies in the benchmark that are held in the portfolios (x-axis)

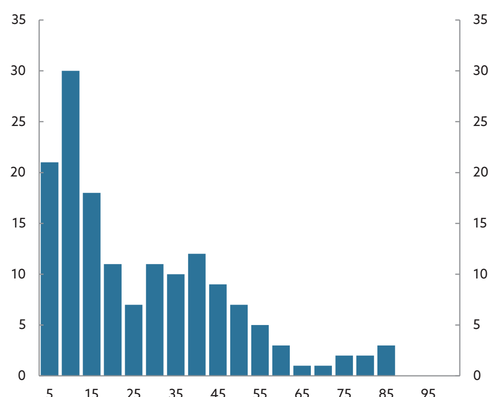
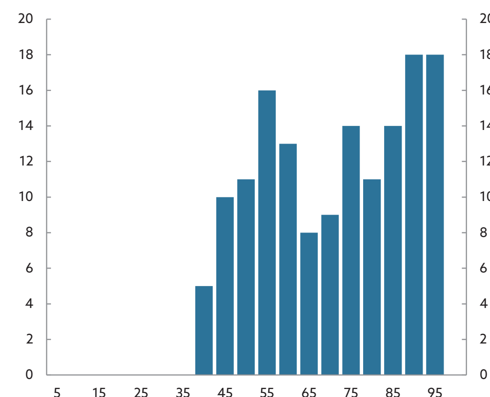
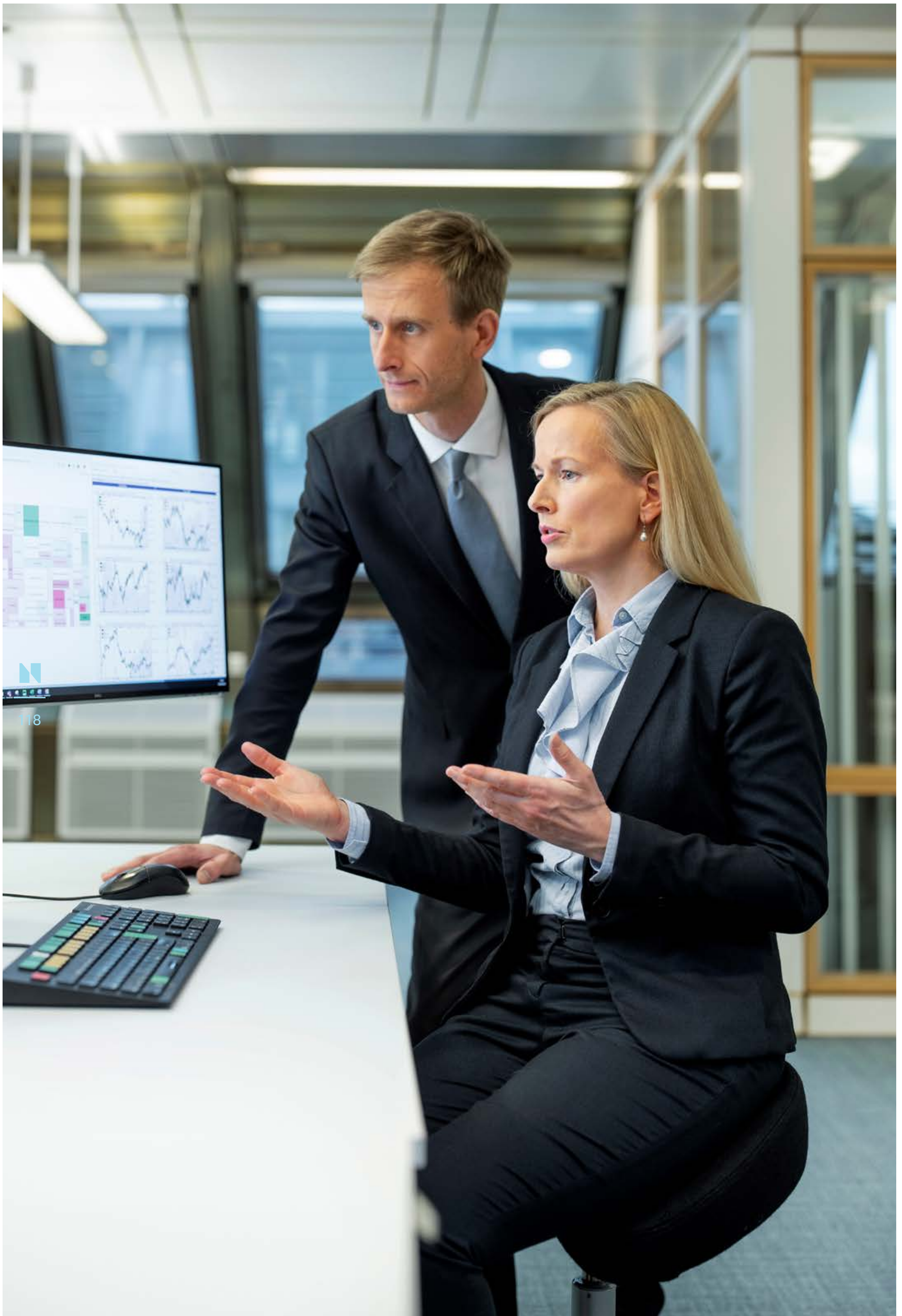


Chart 71 Number of emerging markets and small-cap portfolios (y-axis) sorted by average active share in the portfolios (x-axis).





Portfolio implementation
We evaluate historical trades to analyse investment decisions and the timing of implementations. By paying attention to how the trading lines up with changes in recommendations from investment banks, our understanding of the reasoning behind implementations increases.

In terms of decision analytics, our analysis will look into questions such as whether the manager buys or sells after a sell-off in a stock due to a negative earnings announcement. Does the manager have a tendency to buy stocks that are at all-time highs, or conversely stocks that have fallen significantly, hitting new lows? The investment decisions of a manager who buys at new peak prices tend to be quite different from those of a manager who looks for stocks that are substantially down from past prices. If a manager claims to be a value-oriented portfolio manager, but consistently purchases securities trading at a premium to the market or at all-time high prices, we will revisit the manager to better understand the actual investment process.

We are not averse to trading, and our managers with higher turnover have outperformed those with lower turnover. Calculated over all emerging markets and developed markets small-cap mandates, the 40 portfolios with an annualised turnover of more than 100 percent have had an annualised excess return of 4.3 percent. The 37 portfolios with turnover of less than 25 percent have had an excess return of 1.2 percent. It is, however, important for us to understand why a manager changes the investments and what new information this trading is based on.

Based on our database of the external managers' daily transactions, we have built a trade monitor that shows each of the portfolio managers' trading activity for each company in the portfolio, the volume of shares traded and at what price. This information is coupled with information on when the portfolio manager met

Chart 72 Annualised relative return for all emerging markets and small-cap portfolios (y-axis) and annualised portfolio turnover (x-axis). Percent

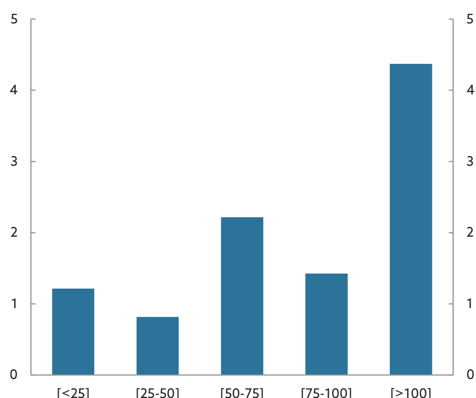
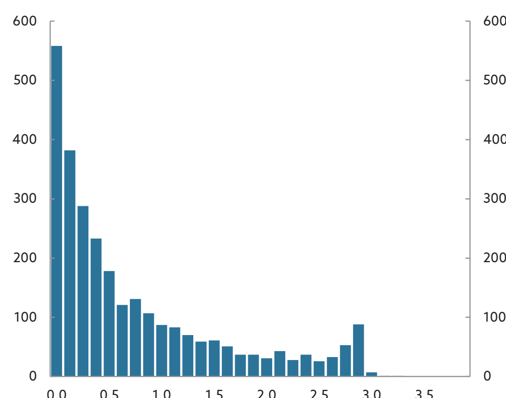


Chart 73 Ownership of companies in emerging markets and small-cap portfolios. Percentage of total shares outstanding on 31 December 2018



the company and on changes in investment banks' recommendations. This is a valuable tool in our understanding of the portfolio managers' implementation of investment decisions.

Early on, we analysed external managers' trading costs through an external consulting firm that specialised in calculating market impact costs. As our monitoring evolved, we decided to perform the analysis of managers' trade execution and its impact on performance internally.

Often, it can take several days or weeks to buy or sell portfolio holdings, as our average ownership in the emerging markets and developed markets small-cap portfolios is 0.79 and 0.82 percent respectively. At the end of 2018, 209 companies in the combined portfolio had an ownership level above 2.5 percent. We evaluate price movements during and after transactions in our portfolio to assess the trading abilities of the firm and the expected transaction costs for the portfolio. We focus on external managers' capabilities in trade execution in our regular meetings with each manager's trading desk. In these meetings, we discuss how the traders find pools of liquidity in illiquid markets, the interaction between the trader and the portfolio manager, and the manager's views and own analysis on optimal trading.

Combining mandates

As part of our decision, we analyse how the manager's portfolio will work in combination with our other mandates in the same market and in the aggregated portfolio of external mandates. The managers are not considered in isolation. Our attention has been on combining managers in such a way that they consistently deliver excess returns over time. It is therefore vital that the aggregated portfolio deviates from the market portfolio. We use several metrics for the aggregated portfolio, to make sure that we have the right investments when the new portfolio is included.

Combining managers is a matter of which managers should be awarded a mandate, how many managers we should have in each area, and what proportion of our total assets we should allocate to each mandate. This means that the analytics used to combine managers focus on changes in each of the portfolios over time. The analytics used centre around sector exposure, factor exposure, market exposure and company-specific exposure over time. We analyse how the aggregate portfolio of existing and potential new managers evolves through different market cycles, and how this affects the expected excess return for the aggregate portfolio. Furthermore, during our discussions with the portfolio managers, we concentrate on how the investment decisions are made, and how the investments change as market conditions vary over time. We analyse the portfolios of potential new managers, as well as of existing managers, on the same dimensions as the managers, in addition to other industry-standard risk models. We use the knowledge we gain from these studies to scale our investments across managers. For the countries where we have selected two, three or four managers, the average overlap between the managers in each country is between 28 and 30 percent. Our experience is that the overlap between the combined portfolio and benchmark in each country increases as more portfolios are added, but only on the margin, due to our focus on combining the managers. On average, going from one to two managers and equal-weighting their funding, our average overlap increases from 43 to 48 percent, while the increase in average overlap varies between 3 and -3 percent from three to four managers.

As the number of mandates has grown, so has the natural diversification across investment areas. Initially, we looked for different managers with different career paths and ages for each regional mandate. As we have moved towards local managers with a narrow country mandate, the background, culture and thinking are more naturally diversified. However, we still concentrate on selecting managers with different backgrounds and experience, and combine the portfolio of external managers in such a way that we are exposed to different investment styles. Style is not limited to the traditional value and growth approaches, but covers more broadly the analytics and investment approach of the managers, for example different approaches to evaluating the relevance of information.

Our decision on how many active mandates the fund should award within a certain market, such as a country or region, depends on the depth of the market, how many companies there are to choose from, how much can be invested in these companies, the size of the assets the fund would like to allocate, and the capacity of each manager's strategy.

Furthermore, the ability to adjust our aggregate exposure actively by changing the allocation to different mandates varies with the type of strategy and available liquidity. Mandates in broad regions and large countries offer significantly more liquidity and flexibility to make adjustments in the near term than specialist small-cap or less liquid emerging markets mandates.

Chart 74 Average manager overlap by number of managers in country. Percent

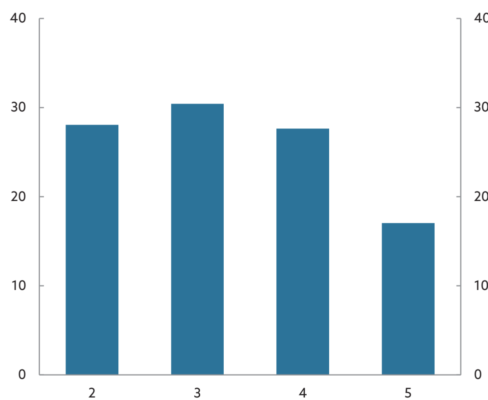
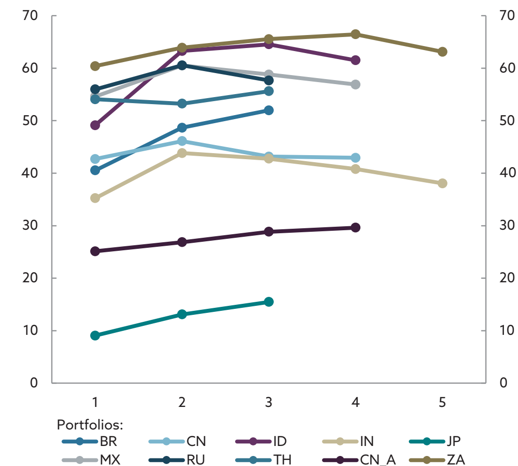


Chart 75 Overlap with benchmark and the combined portfolio in a given country as sequential portfolios are added. Combined portfolios are equal-weighted. Portfolios are in order of highest marginal contribution to overlap



Funding mandates
Once a manager has received a mandate, he or she provides us with a list of holdings which is the target portfolio of equities that he or she would like to buy. This has gradually changed over the years. Initially, with regional and sector mandates, most of the funding was in equities. As the mandates became more specialised and as we built up the emerging markets exposure, the funding was primarily in cash. Cash will always be allocated over an extended period to keep the cash holdings in the manager's portfolio low and to ensure that the manager buys the companies over a long time period to reduce market impact. Since 2016, the average and median length of the funding period has been five months.

The procedure for reducing the portfolio has also been gradually changed. When reducing a portfolio manager's allocation, we ask for a list of companies he or she would like to reduce. We analyse the estimated trading costs and liquidity and evaluate whether we or the manager are best positioned to sell the companies, taking into account direct commissions and expected market impact. The local manager is often better placed to find pools of liquidity, as the manager knows which market participants might be interested in buying large stock holdings. This will particularly be the case for less liquid companies. The manager will then transfer the cash to us. The transaction process is monitored to ensure that we are not disadvantaged, and that transactions between different clients are always made at objective, fair and transparent market prices.

When terminating a mandate, we will always transfer the complete portfolio of stocks to our internal portfolio. Once a manager's portfolio is terminated, we have no guarantee that the manager will have our interests in mind if instructed to liquidate the portfolio. We have therefore decided that we will always do the trading internally when a mandate is terminated.

When terminating, we calculate what we need to sell and buy to achieve a neutral portfolio in the market. We will do this over a long period of time to limit market impact costs. If another manager in the same market is to receive an allocation, we will receive his or her target list of stocks and evaluate the overlap to see whether some stocks can be transferred directly. This is done to avoid the cost of trading the same stocks.

Termination is performed with same-day notice. This is possible because we use separately managed accounts and have full flexibility to terminate mandates without having a replacement manager ready to take on the assets. The ability to terminate managers quickly is an important element in risk mitigation. Most of the terminated managers have generated an excess return before termination.

With 227 equity mandates terminated out of 308 awarded since inception in 1998, an average of 11 mandates have been terminated every year. A large share of the terminations, 37 percent of the assets, have been due to the shift in our strategy from regional, sector and environmental mandates to emerging markets and developed markets small-cap mandates. 27 percent of terminated assets have been due to significant changes in relation to the portfolio manager, such as leaving their employer or expanding their coverage. Similarly, if there are other changes to the team or organisation that make us less convinced that the expected excess return is the same as when we selected the manager – for example if an important specialist analyst is promoted to a generalist management role – we will terminate the mandate.

If our confidence in the manager decreases, we will terminate the manager, regardless of how long he or she has had a mandate. The mandate with the shortest life was terminated after two weeks due to the portfolio manager leaving the firm. The earliest we have terminated a mandate after concluding that we made the wrong selection is after nine months. Lack of confidence also includes termination due to significant changes in operations or compliance personnel that do not meet our standards.

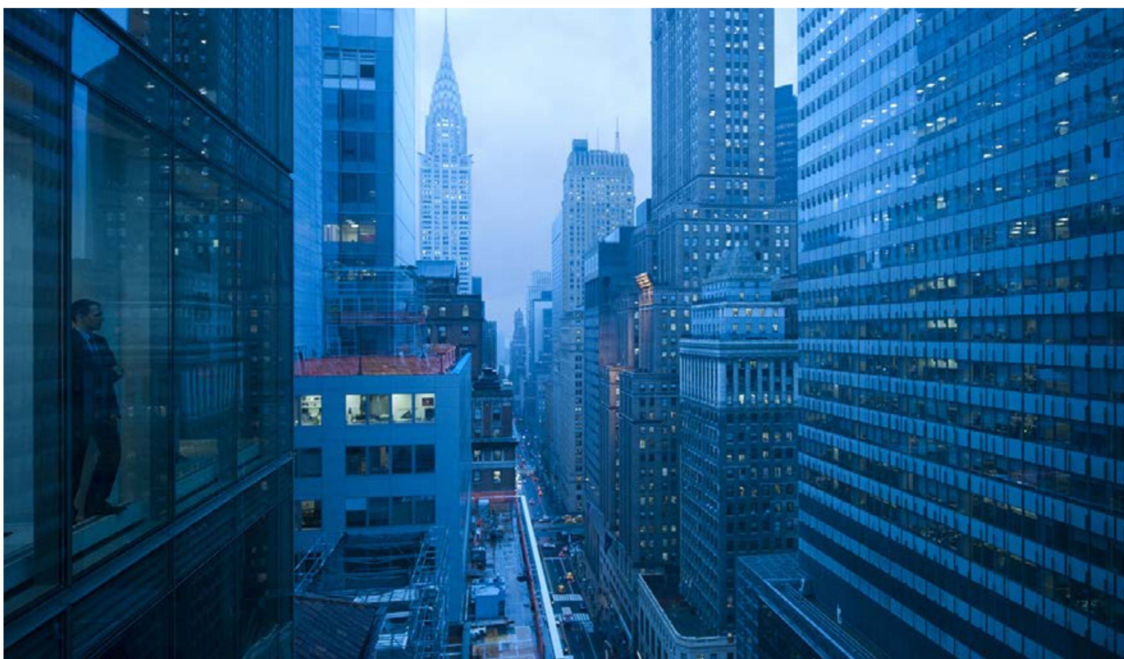


Chart 76 Number of terminated mandates by reason for termination

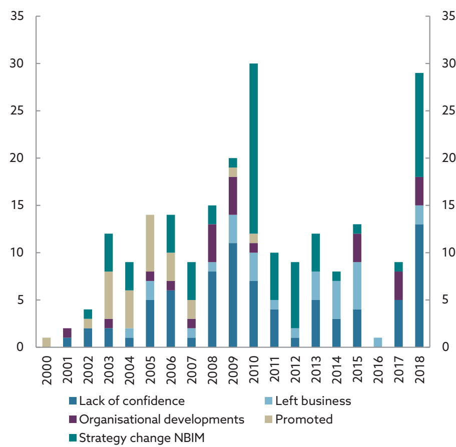


Chart 77 Assets of terminated mandates by reason for termination. Million kroner

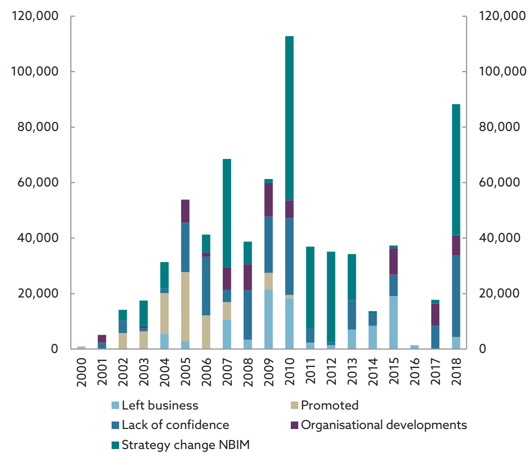


Chart 78 Share of assets of terminated mandates by reason of termination. Total since inception. Percent of total

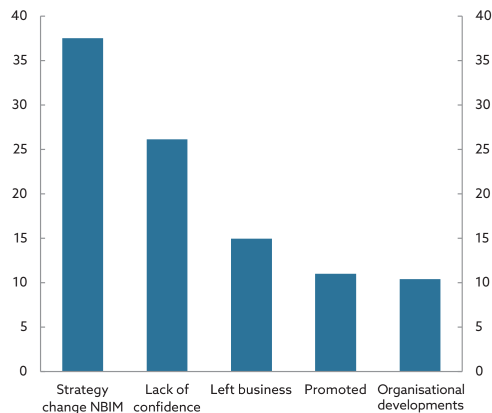
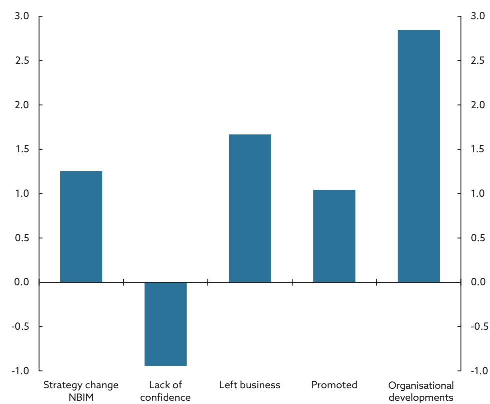


Chart 79 Excess return for terminated mandates by reason for termination. Percent



The portfolio manager

There are some common characteristics among our portfolio managers that we believe increase the likelihood that a manager will deliver high returns.

The manager types we have chosen to invest with are quite diverse. We nevertheless believe there are certain personal characteristics that help make a good portfolio manager, and that the ability to generate excess performance is dependent on the individual.

Personal characteristics
There are a set of personal traits that we have seen to be common to the external managers who we see as a good fit for our strategy. These managers are curious, humble and willing to change their minds.

Portfolio managers must be curious and always looking for new information. Our external managers question everything people tell them. Why is a company hiring more people in one department? How are their competitors doing? Are there new competing products being researched by companies that are not competitors today? Is the supply chain efficient?

Investing is based on predicting the future value of a company. There is never a definitive answer, as market dynamics may change, the company's products may become obsolete, and regulation may drive the price up or down. It is therefore vital that the portfolio manager understands that assumptions and inputs may change, and that he or she must assess the information again and again. Anchoring and tardiness in adjusting probabilities can be costly. Managers who cannot admit mistakes or who blame other people for their mistakes lack the personal quality of being humble and are likely to be overconfident in their own abilities, thereby increasing the likelihood of investing in companies that lose substantial value.

The market is constantly evolving, and it is important to avoid being stuck in a mindset with absolute and definitive opinions. Managers must

be willing to change their minds. This requires the ability to question their own views on a regular basis. It is easy to agree with others and not challenge conventional wisdom, but the market price is the consensus of the views of all investors in the market. Without differentiation from others based on a different set of data and analysis, or a different way of analysing the same information, no excess return will be generated. When the market discovers any differentiated information the portfolio manager has, or new information becomes available that contradicts previously gathered information, he or she must update the analysis.

Individual accountability

Our experience is that personal responsibility and personal accountability often lead to more diligent portfolio managers and analysts. They also lead to more efficient investment decisions and a personal feeling of ownership. We have therefore tended to avoid asset managers that have rigid investment committees.

Accountability for research and decisions is best achieved when the portfolio manager makes the final investment decision. It is important to be aware of personal biases that can affect investment decisions. Investment biases may result in a preference for certain types of company characteristics which may skew the investments made.

Investment biases can be addressed through a review of the investment process. We aim to understand the extent to which these processes operate efficiently to ensure that the manager is sufficiently challenged – without resulting in a consensus decision. We strive to detect biases by evaluating the historical portfolio and exposure to various characteristics, combined with interviews with the professionals influencing or challenging the investment decisions of the portfolio managers.

Alignment of interests

We evaluate whether our interests as a client are aligned with those of the external manager's investment team. We expect our portfolio managers to benefit in the long term if they make good investments. This incentive can often be through ownership or other long-term incentive programmes tied to portfolio performance. Another way to align interests is to make sure the performance-based structure for employees is designed such that the portfolio manager's performance pay is directly linked to the excess performance of our portfolio. Information on remuneration systems is collected to ascertain the probable alignment of interests between us as a client and the individual portfolio managers.

Small, privately owned asset management firms are independent of any bank, broker or insurance company, and we often see that they have a better alignment of incentives with clients. Our experience is that asset managers owned by other financial companies tend to have other roles that take up more of the portfolio manager's efforts or may skew the incentives.

It has therefore been essential to be particularly vigilant when considering managers in these structures to ensure that they have an incentive structure in place that aligns their interests with those of the client. Furthermore, when portfolio managers have an ownership stake in the firm, the teams tend to be more stable and focus on long-term performance. We have also found that privately owned firms seem to be more willing to invest in personnel, such as exceptional analyst talents who can provide the best possible input for the portfolio managers.

Research ability

One of the important lessons we have learned is that the managers need to have the capacity to perform differentiated analysis and investigative inquiries. Our external managers are specialists and strive to do a few things very well. They understand that they cannot know everything about everything, but seek to gain an information edge by continuously searching for information. This requires the ability to stay focused on the segment they have chosen and not start to wander into other segments where they have less expertise. They also analyse the available information differently, and interpret the information obtained to get a better understanding of the companies they invest in.

The managers find information through their own analysis of the market and companies. They need to meet the company they are interested in investing in multiple times, and gain access not only to the CEO and CFO, but also to people who are more directly linked to the activities of the company on a day-to-day basis, to see how its strategy is played out. If investing in a manufacturing company, they will, for example, meet factory managers to see how they manage their workers and evaluate whether they have good health and safety standards. They will meet the designers and engineers who come up with new ideas to develop the company's products, to see how innovative the company is and how innovations are implemented. By meeting different people across the company, they uncover whether the strategy is well-anchored in the organisation and whether there are red flags that stand out. By gaining input from multiple sources, and from different ones to other investors, the manager is more likely to have a more complete picture of potential developments.

Our external managers are invested in around 2,200 companies and have around 26,000 company meetings per year. About 35 percent of these meetings are with companies the managers are invested in. This means that the managers meet many more companies than they invest in and that they meet many companies multiple times. The manager needs to form a complete view of the company and the market it operates in, and assess the company from all angles to test and verify what the company is communicating. This means that the managers not only meet the company repeatedly, but meet a range of market and industry experts, consultants and relevant authorities that might regulate the company's area. They meet competitors of the company to see whether it has a competitive edge over its peers. In addition, the managers meet customers and suppliers of the company, to evaluate customer satisfaction, brand recognition and the strength of the suppliers.

Our managers are focused on capturing and analysing data. As more and more data sources become available, including credit card data, online pricing, industry-specific databases and miscellaneous other big-data sources, having a structured and clear strategy for how to gather and analyse these data is becoming increasingly important. While some investors today buy exclusive rights to use databases for investment purposes, it is equally important that they efficiently process the vast amounts of publicly available information in the market. Qualitative information, supply chain investigations, interviews and management contact are therefore important to get the most out of the data our managers collect. It is usually not the availability and quantity of data that are the issues, but the ability to transform the data into useful information on cashflow and discount rate projections. Knowledge is more powerful for

those who can put it into context and have clear explanations for why it shows what it does.

Good information is about allocating resources and thoroughly evaluating the information obtained. Our external managers need to do thorough research to find companies with sustainable business models and potential for excess return in the market they operate in. They also need to be challenged on their assessments and conclusions by other members of the investment team. The research is continuous. The manager needs to continuously re-select the company, meaning that they need to constantly consider whether the factors driving its price are changing and whether the company is exposed to changes in sustainability and governance risks.

Identifying good governance

We have a clear expectation that our external managers have the ability to evaluate factors such as a company's board structure, management incentives, shareholder rights, business ethics and risk management, when considering the attractiveness of investments. Weak governance practices can destroy value through inefficient corporate decision making, misallocation of capital, fraud or corruption. The quality of management and management structures is therefore closely linked to value creation, and this is something our portfolio managers pay considerable attention to. Over the years, we have developed a strong appreciation of the importance of having portfolio managers with the skill to identify governance challenges. This has been particularly evident as we have moved more into emerging markets and small companies.

One very important factor when hiring local asset managers is that they can identify which companies we should avoid being invested in. Through our dialogue with asset managers, we present a clear expectation that they have a special focus on governance risks, and we follow this up closely. Local expertise is needed to really know the board members, management and families behind the companies, and to understand how this affects corporate governance. Local expertise is also needed to understand how the owner of a state-owned enterprise affects the business decisions of that company. By using local managers who meet and understand the company's management, board and majority shareholders, we ensure that our managers have a particular eye on choosing companies with good corporate governance, resulting in a better selection of companies than if we were to use other screening methods.

The management organisation

Over the past 20 years, we have identified some key factors that help us select the most suitable management organisations with a strong investment culture. We believe that the ability to generate excess return is primarily tied to individuals, and they need an investment organisation where they can thrive.

All organisations are different, and so they should be. Still, there have been some key elements that are common denominators.

Our initial questionnaire, answered by organisations applying for a certain mandate, has evolved over time and consists currently of 26 questions related to information about the firm, the asset manager's investment strategy, the team and the latest available portfolio.

Our analysis of the portfolio, the initial questionnaire and additional data gathered in meetings, results in a decision on whether the manager will be included on the short-list of candidates. These managers receive our comprehensive follow-up questionnaire, which has questions on the organisation, board members, operational procedures, compliance routines, licence to operate, regulatory issues, the historical portfolio and how they work with corporate governance.

The key purpose of the information-gathering phase, through questionnaires and interviews, is to understand whether the investment organisation has a competitive advantage to invest in the relevant market. It is essential to get to know the organisation and its investment, compliance and operations personnel thoroughly. The only way we can get this comprehensive understanding is by questioning personnel at their offices, in addition to analysing the written replies, databases and other sources of information. This means that we look for information that helps us understand the manager's edge and shortcomings.

Ownership structure

We analyse the ownership structure of not only the asset management firm, but also the parent companies and potential relations with larger financial conglomerates. In addition, we analyse changes in the ownership structure over time, the board members and whether they are independent or exposed to political interests. Politically exposed persons are subject to higher scrutiny, due to an elevated risk related to their proximity to policy makers and market regulators.

We have a preference for small, privately owned asset management firms. Asset managers owned by, or affiliated with, other financial institutions need strong control across the different businesses to avoid improper flows of information or assets. Assessing whether this control is strong enough may at times be difficult. Furthermore, we have found the teams to be more stable at privately owned firms than at firms owned by other financial institutions. We have also seen a stronger focus on attracting, retaining and growing talented people in small organisations, where they have a larger impact on investment decisions. Finally, we have experienced a better alignment of interests when the portfolio managers have an ownership stake or other long-term vested interest in the firm. At the end of 2018, only eight of our mandates were with firms owned by other financial institutions. This has been fairly stable over the last ten years. Furthermore, only 18 mandates were with large organisations. This has been fairly stable since 2010. We have experienced higher excess return with privately owned management firms than with insurer- or bank-owned managers, 2.6 versus 1.8 percent. Similarly, our mandates with small and medium-sized firms have generated 2.6 and 3.5 percent in annualised excess return, while the mandates with larger firms have generated 1.7 percent.

Chart 80 Number of mandates by type of organisation

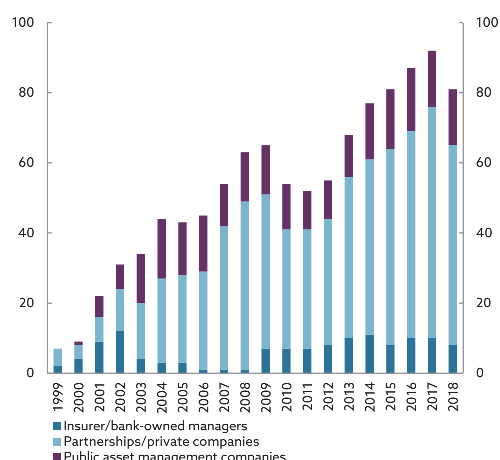
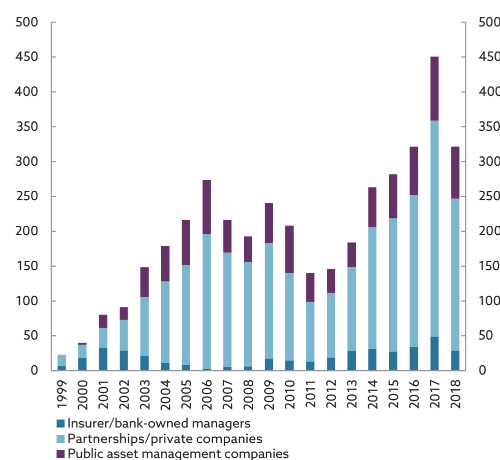


Chart 81 Assets by type of organisation. Billion kroner



There are, however, challenges with small, privately owned asset management firms. One is that they may lack a sufficiently independent compliance function, or that operational functions are not adequate. We analyse this in our selection and monitoring of the managers by regularly meeting compliance and operations personnel on-site.

Large asset management firms can have an advantage in markets where access to company management is difficult and where there are economies of scale. However, their size can also lead to inefficiencies and a more rigid structure. The communication lines may be longer, and the process may lack individual accountability. Furthermore, large management organisations often have more assets under management, which means more stocks need to be bought or sold whenever they change the portfolio. This may lead to higher implementation costs outweighing the potential benefit from having a sizeable team. Our research also shows that large organisations spread their investments across more names, to avoid substantial holdings in companies. Such organisations also have more assets in large companies, due to the need for more liquid stocks. This means that they deviate less from the benchmark.

Chart 82 Number of mandates by size of organisation

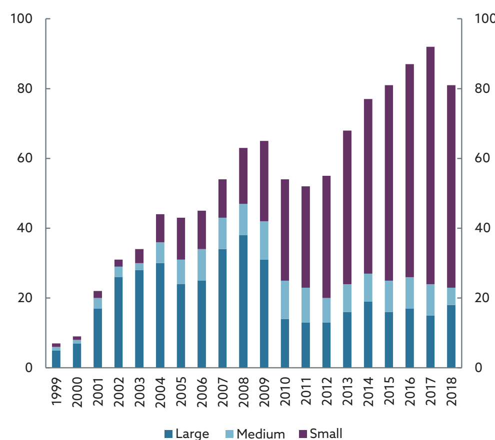
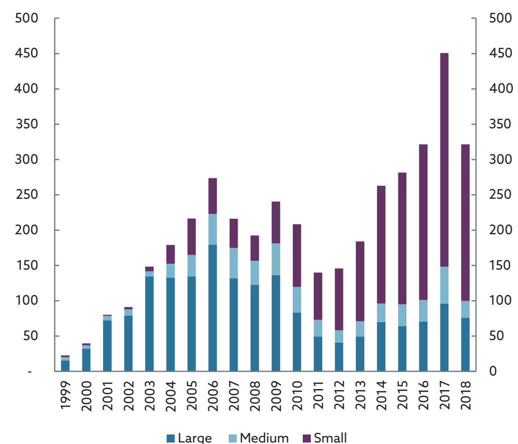


Chart 83 Assets by size of organisation. Billion kroner



Operations and compliance

One important item during selection is to clarify regulatory registrations, licensing and any past regulatory or legal actions, proceedings or investigations against the company. It is, for example, vital that the firm has no serious historical or pending regulatory or legal actions, has adequate operational procedures and has good compliance routines for internal trading of stocks, equal treatment of customers when trading for different portfolios, and whistleblowing procedures. While no-one will be awarded a mandate for simply having superior compliance routines, no firm will be hired if we have concerns that its routines and procedures are inadequate.

We meet each asset manager's operations and compliance personnel to ensure that they have proper controls in place. Operational errors during the settlement of trades can lead to substantial costs. Furthermore, history shows that frauds are made possible by an absence of appropriate operational procedures and controls. To avoid such unintended issues, our due diligence processes around operational procedures are important.

We evaluate whether the asset manager has internal procedures for personal trading, reducing conflicts of interests, and equal treatment of clients. When meeting operations and compliance personnel, we evaluate their experience and standing in the organisation to enforce such procedures.

In 2009, we commissioned the first independent integrity report from an auditor on a potential external management firm and significant team members. In 2010, this was rolled out across all existing mandates, and it has since been used for all external mandates.

This report is based on searches in external databases, local sources and interviews with local market participants. The objective is an additional and independent review of the candidate's background, professional network, links to entities/individuals, corporate affiliations, reputation, regulatory actions and litigation, sanctions and adverse media findings. The outcome is an assessment of the likely integrity of both the firm and key individuals. This report is followed up with quarterly internal checks in global databases by the fund's compliance department to get additional input on the manager's integrity and public profile.

Since inception, we have experienced regulatory issues with only three of the 308 selected managers. All these managers were terminated as a risk-mitigating action while waiting for the outcome of the regulators' investigation.

Monitoring

We see stability of the investment organisation and the ability to attract high-quality talent as important for future performance. The investment management industry is highly competitive. Having access to the best team possible is therefore important. During the initial meeting, we therefore ask detailed questions about hires and departures. High employee turnover could be a sign of organisational issues, while no turnover could be a signal of complacency and acceptance of underperforming team members. The information from hires and departures is connected with information from the initial questionnaire to find where the asset manager recruits new employees from.

In the follow-up questionnaire, we ask about other clients. We do not look for asset managers with impressive client lists. Our concern is the stability of the asset base and therefore the viability of the asset management firm as a business in a downturn or a period of poor performance.

Our external managers are required to answer two detailed questionnaires once a year: an investment update and a compliance and operational risk questionnaire. These have been part of the monitoring since inception, but the types of questions asked have changed over the years.

The investment update covers changes in the investment team, including changes in remuneration, responsibilities and board participation. It looks at changes in assets and other portfolios, as well as an update on financial status with last year's revenues and costs.

The answers to these questions provide valuable input for our analysis and review of the stability of the team, which mandates they are concentrating on, equal treatment of our portfolio compared to other portfolios, and the relative size of our business and that of other clients.

The questions we ask about sustainability and governance issues include how they are integrated into their investment process and decisions, confirmation of where the managers obtain information to assess company exposure to relevant governance issues, and a description of which issues are most relevant and common in the markets they operate in.

The operational risk questionnaire covers changes in the organisation, ownership and board members. It covers investment licence, new audits, regulatory inspections and legal actions, as well as changes in control procedures for material non-public information, personal trading, conflicts of interests, whistleblowing, equal treatment of portfolios, and escalation of breaches of ethical procedures. We ask about their operational risk management, control procedures, internal control structure, changes in service providers, internal audit functions, compliance procedures, post- and pre-trade compliance, and changes in compliance personnel and responsibilities.

One example of issues that we have identified through our evaluation of the answers concerns equal treatment of clients when trading for the portfolio. We ask the managers how they ensure equal treatment of all clients. By analysing the written answers, holdings in retail funds managed by the manager, and information from meetings, we have over the years uncovered three managers who have treated our portfolio differently to their retail funds. In other words,

they have treated us unfavourably by buying or selling stocks for other clients prior to our portfolio. These managers were terminated, and we further strengthened our control procedures.

The operational risk questionnaire changed after the financial crisis, as compliance was given more importance, and we added questions about the chief compliance officer and her or his team, personal trading and whistleblowing procedures. In 2018, we added more questions related to IT security.

The responses to the questionnaires are evaluated and used as input in our discussions with the firm's management, the investment team's management, the portfolio manager, and operations and compliance personnel at our annual due diligence meeting. The managers are not only thoroughly evaluated ahead of selection, but are continuously evaluated throughout the lifetime of the mandate.

Decision making
The decision making within a firm matters greatly for the results produced by individual portfolio managers. Firms that are bureaucratic or excessively focused on inflexible procedures are, in our experience, unlikely to attract the best talent. Strong portfolio managers often tend to feel stifled in hierarchical structures and aim to avoid joining such firms.

Details of the organisational set-up with investment committees and reporting lines are therefore important for our evaluation of the managers. We have a clear preference for organisational structures where portfolio managers have discretion to build the portfolios that they believe have the highest probability of outperforming.

An important component of the interviews with investment personnel is to analyse their impact on the ultimate portfolio decision. To get the full picture, we must know the entire organisation. We have separate one-on-one meetings with the portfolio managers and those influencing investment decisions, including analysts, traders and other relevant personnel. By doing this, we can identify whether their versions of the investment process correspond and whether they have an investment culture that is supported by all levels in the organisation. We believe that the ability to generate excess return is primarily tied to individuals.

Without the right individuals, no organisation can conduct the research needed to generate excess return. The ability of the firm and its leadership to attract, retain and grow talented staff is highly important, as is the organisation being set up to optimise the amount of time available for investment personnel to concentrate on investments. Any non-investment responsibility is costly in a highly competitive marketplace. This is also why a portfolio manager's promotion to chief investment officer or some other management role is one of our most common reasons for terminating investment mandates. For new firms started by experienced investors, it is very important that sufficient operational capabilities are put in place to allow the founding portfolio manager to have his or her full attention on investing, not running a start-up.

The trading team is normally a separate function within the investment area. As transaction costs can be an important detractor of returns, we always interview the trading desk and evaluate their processes and systems. There are several factors that will impact trading costs, including not only the size of the portfolio in question, but also the total amount of assets in similar

strategies managed by the firm. We believe it important that traders manage their trading in a close relationship with the portfolio manager. We are careful to make sure that traders have processes to ensure that they do not pass too much information to the marketplace and their counterparts when they conduct their trading, as well as processes to ensure equal and fair treatment of all clients and products. We prefer trading desks with a thorough system for evaluating their own trading efficiency.

Culture

During the information-gathering phase, it is important to meet personnel with various levels of experience to reveal the culture of the firm and how it supports their capability to generate excess returns. Our meetings are structured to identify or falsify the differentiating features of the managers and their products. In a given year, we have 400-450 meetings with potential new managers and existing managers. Since the fund's inception, all meetings with both existing

and new managers have been conducted at their own offices. Of the 452 meetings in 2018, 229 were with existing managers and 223 with new managers. Of the meetings with new managers, 157 were initial meetings and 59 follow-up meetings, that is second and third meetings with short-listed managers. Of these follow-up meetings, 13 ended in a new manager being funded. In the other cases, either the manager was not selected, or we were unsuccessful in reaching an agreement on the fee schedule. The numbers for 2017 are fairly similar, but with more initial meetings with potential new managers (212) and a bit less meetings with existing managers (172).

This means that we see the managers in their operating habitat, not on investor roadshows. We prefer to meet managers in the "engine room", which basically means meeting them at the desk where their work is done. By doing this, we also get a better view of how portfolio managers and analysts are seated and how this may impact daily interaction.

We need to meet and get to know all personnel who provide significant input for our mandates: portfolio managers, analysts, traders, chief investment officer, and operations and compliance personnel. There are so many people involved that we could not fly them all over to one of our offices.

As we see it, a good investment culture is set from the top. This means that the asset managers need a management group who have a clear understanding of what their corporate culture is, and that this culture needs to be

Chart 84 Number of meetings with new and existing managers

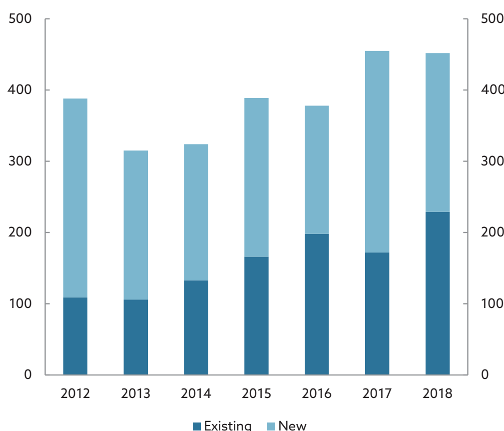
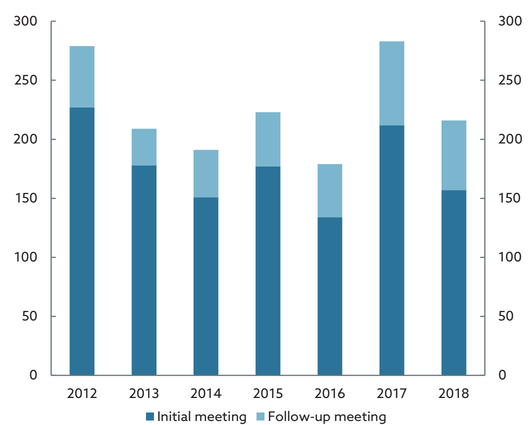


Chart 85 Meetings with new external fund managers



reflected in how they conduct their research and investments. New management with a poor understanding of the team's specifics can change the investment culture negatively. Managing an asset management firm is, for example, very different to managing a commercial bank. Over time, we have found that smaller asset managers and partnerships are more likely to have the investment culture we believe is needed to succeed. Portfolio managers at privately owned asset management firms have delivered higher excess returns for us than those in other ownership structures, and portfolio managers at smaller firms have delivered higher excess returns than those at larger firms.

We assess how company analysis by junior staff influences portfolio decision making, the culture of openness in terms of both challenging and listening to these analysts, and how this is evident in the subsequent investment decisions which can be assessed through our holdings review. In these interviews, we look particularly at whether there is a culture where people are curious, focused and willing to change their minds.

Chart 86 Meetings with existing fund managers by region

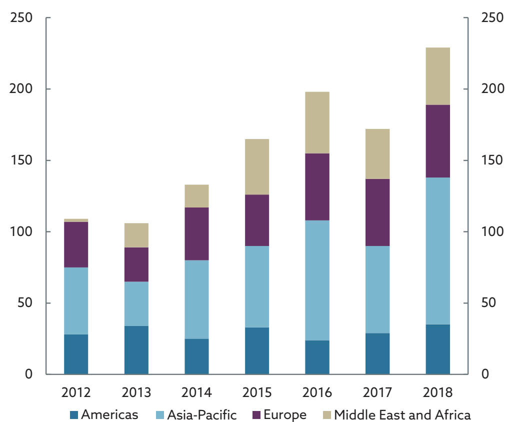
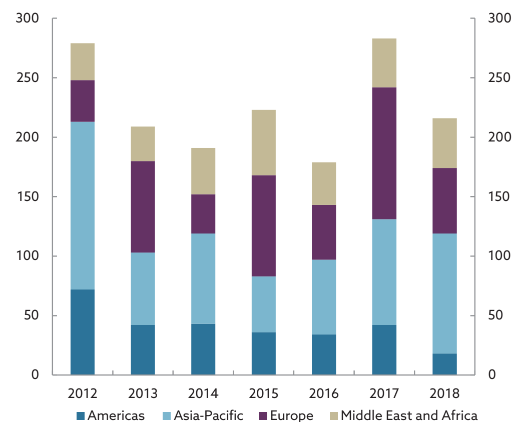


Chart 87 Meetings with new fund managers by region



The return

Since inception, our external managers have generated an annual excess return of 1.8 percent after fees, or a total of 47 billion kroner.

Our experience with external active equity managers has been good. From 1999 to 2018, external managers delivered an average annual excess return over their benchmark of 2.1 percent before fees and 1.8 percent after fees. This is additional return achieved by the external managers through their active investment approach.

High and stable excess return

We have seen excess returns after fees from our external managers in 16 out of 20 years. Only 2006, 2008, 2011 and 2016 were negative after fees.

The relative excess return has been positive in each of the five-year sub-periods. For the periods 1999-2003, 2004-2008, 2009-2013 and 2014-2018, our excess performance before fees was an annualised 3.6, 0.3, 2.5 and 2.1 percent respectively. These five-year sub-periods are also natural time periods based on the different phases of the five strategies. For the regional mandates, 1999-2003 was the build-up phase while the last mandate was terminated in 2012. For the sector mandates, 2001-2003 was the build-up phase, while we terminated the last mandate in 2013. 2008-2013 was the initial build-up phase for the emerging markets mandates, while 2014-2018 was the real expansion phase. Developed markets small-cap mandates have two main periods, 2009-2013 and 2014-2018.

Chart 88 Cumulative relative return by strategy. Percent

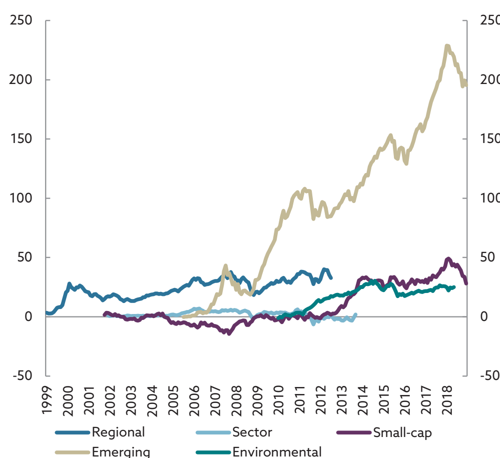
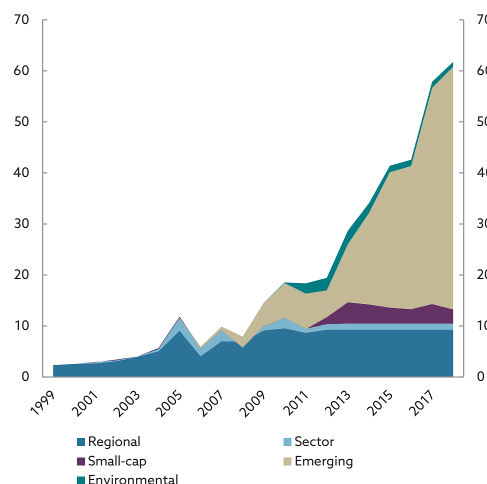


Chart 89 Relative return by strategy. Billion kroner



Unless stated otherwise, the performance figures in the analysis below are before fees. These performance numbers are based on daily calculations of the portfolios and their respective benchmarks, while fees are calculated and paid on a quarterly basis.

Even though the first five-year period was exceptionally good in percentage terms, the assets managed by external managers were limited. The performance measured in kroner was therefore relatively low. It is especially the last two five-year periods that have contributed the most to the excess performance in kroner, with a high percentage excess return and large amounts invested with external managers. In total, external managers have contributed 62 billion kroner before fees, measured against their benchmark. Furthermore, all the strategies have contributed positively before fees to the results.

Time-weighted excess return

The most commonly used performance measure in the investment industry is the time-weighted relative return, which is calculated as the geometric mean of the portfolio return over the investment period, minus the geometric mean of the benchmark return over the same period. For strategies with relatively stable assets under management, this gives an accurate picture of relative performance.

External managers have delivered an average annual excess return over their benchmark of 2.1 percent before and 1.8 percent after fees. External managers in emerging markets have contributed most to the excess performance, with an annual excess return of 4.2 percent before and 3.5 percent after fees, the environmental mandates 2.5 percent before and 2.1 percent after fees, regional managers 1.6 percent before and 1.4 percent after fees, small-

Chart 90 Annualised relative return in percent (left-hand axis) and information ratio (right-hand axis)

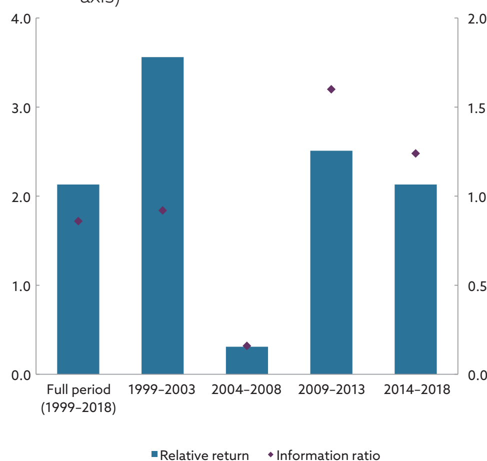
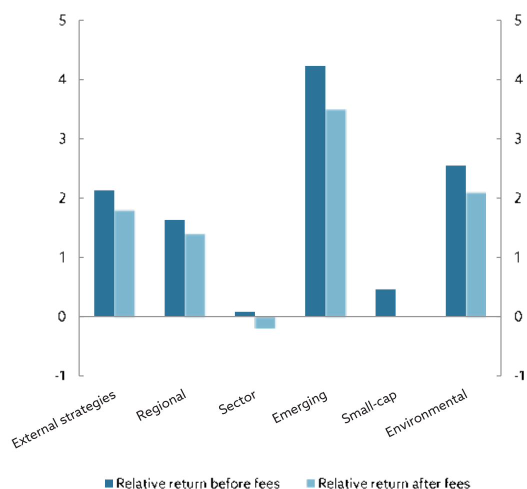


Chart 91 Relative return before and after fees. Percent



cap managers 0.5 percent before and 0.0 percent after fees, and the sector mandates 0.1 percent before and -0.2 percent after fees.

There may be several reasons why our specialist managers in emerging markets have outperformed the other strategies. These are less efficient markets where doing more or better research seems to pay off in terms of better performance, as well as markets where local managers with an understanding of the local mindset and access to company reports and management in the local language are important.

Equal-weighted excess return

We also calculate the average equal-weighted performance, where it is assumed that all the mandates had been allocated the same amount. This gives us an indication of whether our combination and weighting of managers with different assets have contributed positively compared with equal funding for each manager. The average equal-weighted excess return for each mandate is 1.5 percent, which is lower than the 2.1 percent standard time-weighted excess performance of the aggregate portfolio of external mandates. This indicates that our monitoring and weighting have been successful, as a higher excess return for the time-weighted aggregated portfolio than for the equal-weighted average across all managers signals that we have allocated more to managers who have subsequently performed better. This is not what would be expected, as larger markets with more capacity are in general more efficient.

Continuous analysis of exposure and changes in the portfolio gives us a better understanding of the expected future performance of each manager. Based on this, we allocate more or reduce a given manager's funding.

Chart 92 Time-weighted and equal-weighted excess return. Percent

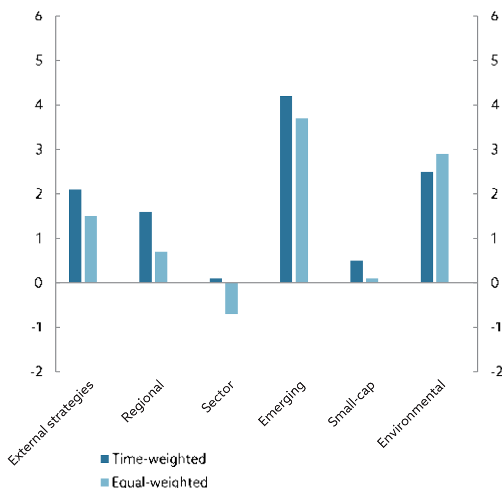
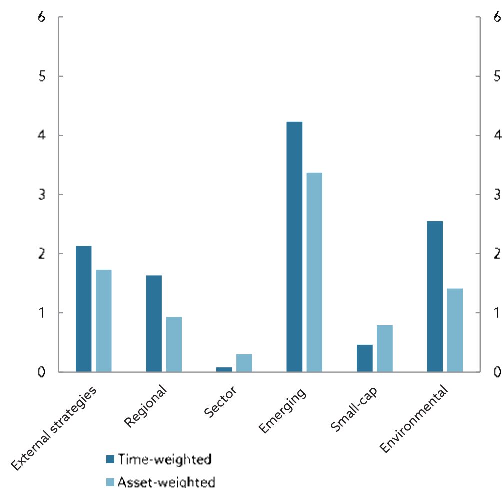


Chart 93 Time-weighted and asset-weighted excess return. Percent



Asset-weighted excess return

Large changes in the value of assets under management during the investment period distort the traditional time-weighted numbers, as the returns in periods with limited assets count just as much as those when assets under management are high. We account for this by looking at the asset-weighted return, meaning that we weight the portfolio return by monthly assets under management. For the external strategies group as a whole, the asset-weighted return over the whole investment period is 1.9 percent, which is slightly lower than the time-weighted return of 2.1 percent. This means that, overall, we have had a higher excess return in times with lower assets under management. This is to be expected, as there is less market impact when trading with fewer assets, and it is possible to have a higher concentration of equities with higher returns.

Interestingly, the asset-weighted relative return is higher than the time-weighted relative return for the developed markets small-cap mandates and sector mandates, where there was a long period with limited assets under management, while most of the outperformance came when assets under management were significantly higher. Conversely, the regional, emerging markets and environmental mandates have had the strongest performance in the build-up phase, with assets under management below average, and hence the asset-weighted return is lower than the time-weighted return.

Manager-specific performance

Our experience with external managers indicates that there are various manager characteristics that correlate with excess performance. We have observed performance differences related to both the ownership structure and the size of the asset management firm.

Ownership structure

The decision-making process and culture at a firm matter a great deal for the results produced by portfolio managers. In our experience, privately owned asset management firms where the investment staff have direct ownership in the business often have a better decision-making investment culture, attract more talented investment personnel and have better incentive structures. Our privately owned management firms have delivered a 2.6 percent annualised excess return for the fund, while publicly listed and insurer- or bank-owned managers have delivered 1.1 and 1.8 percent respectively. The picture is largely the same regardless of the type of strategy.

Given that most of our selections have been privately owned managers and that these have delivered better percentage excess returns, our performance measured in kroner has largely been driven by our selection of privately owned asset management firms.

Size of the management firm

Another observation is the size of the management firm in its market. Small and medium-sized firms have delivered an annualised excess return of 2.6 and 3.5 percent respectively. Larger firms have delivered 1.7 percent. Specialist firms focusing on being experts in a given country are often found among the small- and medium-sized segment of the asset management industry. Such firms thus manage more assets for us, have delivered a larger percentage excess return and have

Chart 94 Annualised mean relative return and tracking error in percent (left-hand axis) and information ratio (right-hand axis). By asset manager ownership type

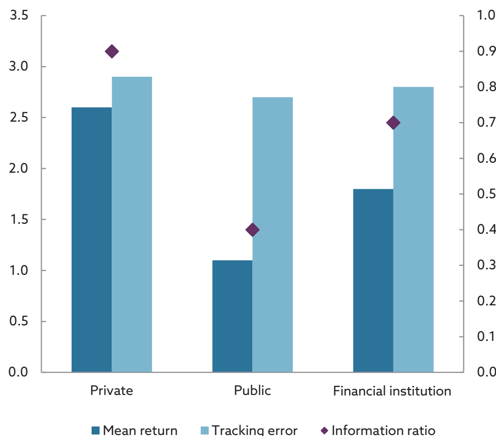
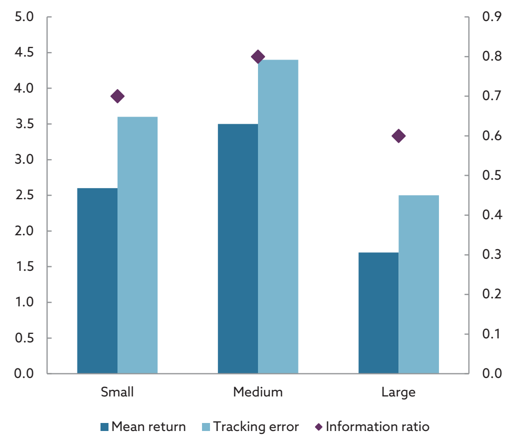


Chart 95 Annualised mean relative return and tracking error in percent (left-hand axis) and information ratio (right-hand axis). By size of asset manager



consequently delivered the most excess return measured in kroner.

It is our experience that the smaller specialists usually deviate more from the benchmark than larger institutions. This is often due to the fact that the fewer assets they manage, the more freedom they have in investing in concentrated portfolios across the full market-cap spectrum. Even when taking the increased small-cap exposure into consideration, we see that small and medium-sized firms have delivered better results for us, with a higher information ratio of 0.7 and 0.8 respectively than the larger institutions at 0.6.

Mandate age

Another question is whether the managers deliver a higher return at the start of the mandate or when the mandate is more mature. To investigate this, we align the mandates to have the same inception date and calculate average performance for each month. All mandates are part of the results for the return in month 1, while in month 120 only mandates with a performance record longer than this will be part of the sample. The monthly return numbers are then chain-linked to calculate cumulative performance. We find that we have a higher return in the first year of a mandate, but that performance continues after this at a high level. After 13 years the series delivers a cumulative relative return of 66.6 percent or 1.7 percent per year.

We have found considerable dispersion in the first year, with some mandates doing exceptionally well and others making a negative contribution. This dispersion reduces over time for more mature mandates, which is to be expected. Managers are allocated a smaller amount initially. As we get more or less confident, through analysis of transactions and more meetings with the managers, mandates are increased or terminated.

Chart 96 Cumulative relative return by mandate age. Percent

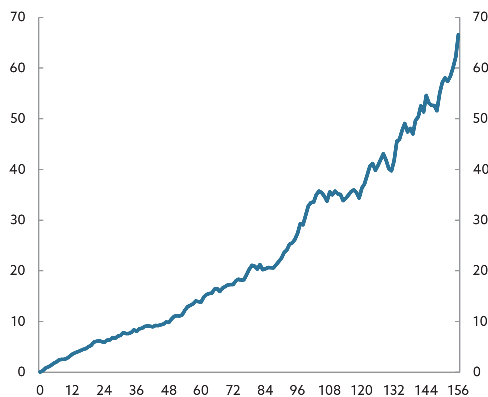
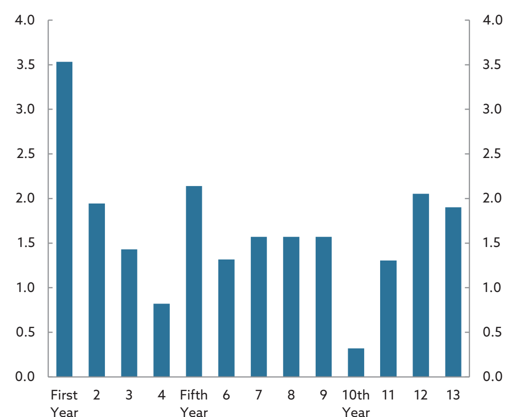


Chart 97 Annual relative return by mandate age. Percent



Information ratio
The information ratio for the time-weighted portfolio of all mandates since inception is 0.86 for the first 20 years. This is higher than the information ratio of 0.25 that we initially expected. The information ratio has been 1.15 for the emerging markets mandates, 0.49 for the regional mandates, 0.48 for the environmental mandates, 0.17 for the small-cap mandates and 0.03 for the sector mandates. The information ratio is calculated as excess performance divided by realised relative volatility.

The total information ratio of 0.86 can be broken down into several sub-components. First, the average equal-weighted information ratio across all mandates with more than 12 months' history has been 0.22. This indicates that the general selection of managers has been successful, but that a lot of the value added has come from work post hire as well as in portfolio construction.

Investing with successful managers for longer time periods and pruning other managers have contributed 0.10 to the total information ratio. We have substantially more data on existing live managers than potential managers and will use this to add to and prune mandates.

Higher allocation to managers who have subsequently performed better have added an additional 0.09 to the total information ratio. This is an indication that we have been able to distinguish between expected future excess performance between managers.

Due to diversification across different mandates within a strategy, the aggregate portfolio has a lower relative volatility than the average manager. This intra-strategy diversification has increased the total information ratio by 0.23. The diversification is due both to having multiple sub-strategies within each area – such as Brazil and China in emerging markets – and to having multiple mandates within each sub-strategy. Selecting managers with differentiated approaches to investing has been a focus since the start of the external mandates.

Finally, having multiple independent strategies has increased the total information ratio by 0.22. Our experience is that while there is some positive correlation in excess return within a strategy, the correlation across strategies is lower. For instance, the correlation between the excess return in emerging markets mandates and developed small-cap mandates has been -0.1.

Chart 98 Information ratio for the combined portfolio of all mandates within a strategy. Mean and 95 percent confidence interval

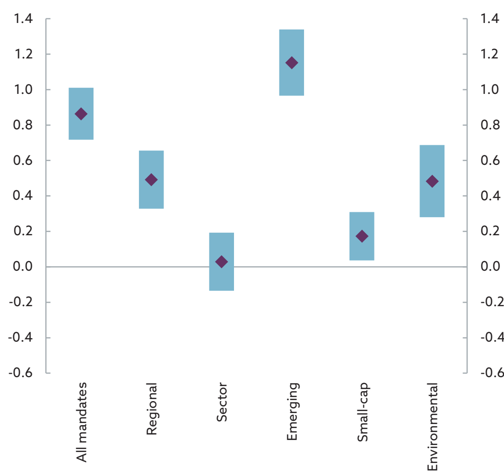


Chart 99 Information ratio for single mandates. Mean and middle 50 percent of the mandates within each strategy

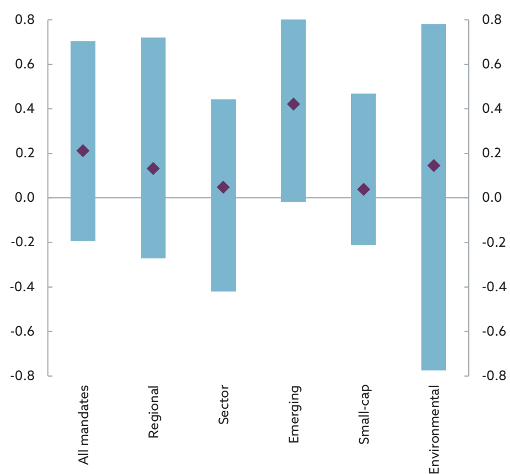


Chart 100 Information ratio by mandate age

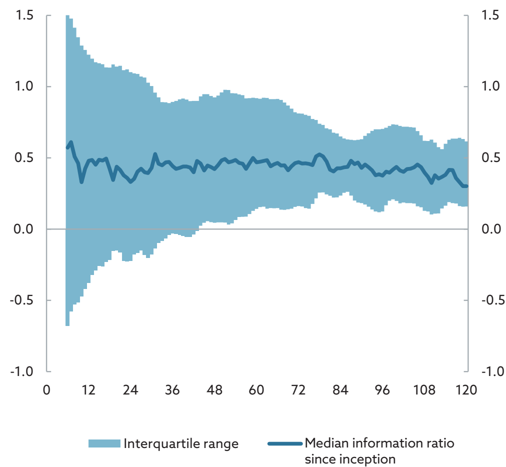
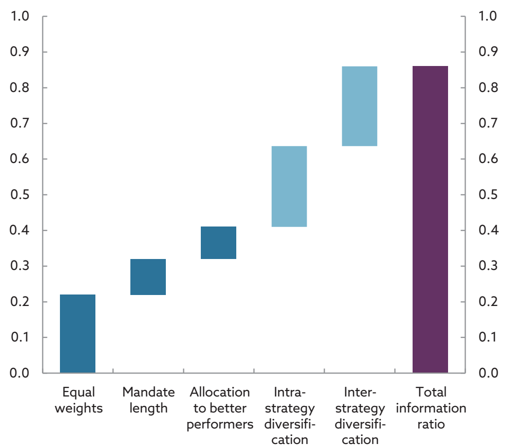


Chart 101 Contributions to information ratio



Performance in different market cycles

It is generally acknowledged that global factors are important drivers of stock market performance. The problem is that they are hard to predict and hard to assess. In order to gain some insight into how these macro factors affect our excess returns, we have divided a range of macro indicators into non-overlapping time segments. These time segments are characterised as bear markets, neutral markets and bull markets. The macro environment we analyse is the performance of the global stock market, the US dollar against a basket of currencies, Brent crude oil prices, and the relative performance of emerging markets versus developed markets.

For each of the different time periods and macro factors, we have measured the annualised relative performance of each portfolio. If macro environments systematically affect our relative performance, we would have seen significantly different levels of excess return in each of these market environments. The initial hypothesis is that the selected managers outperform independently of market cycles, i.e. that the managers outperform the market over time.

There have been different numbers of months of bear, neutral and bull markets for each of the five strategies, but except for the environmental mandates in a bear market, there are at least 22 months for each strategy with each cycle.

What we have seen is that, historically, our excess returns have been fairly independent of the global macro environment, regardless of how we measure these macro trends. These results are encouraging, as they indicate that the excess returns generated by the managers we have chosen have been positive, steady and largely independent of the macro environment since inception.

Chart 102 Excess return in different market cycles measured by increasing/decreasing levels of MSCI World Index

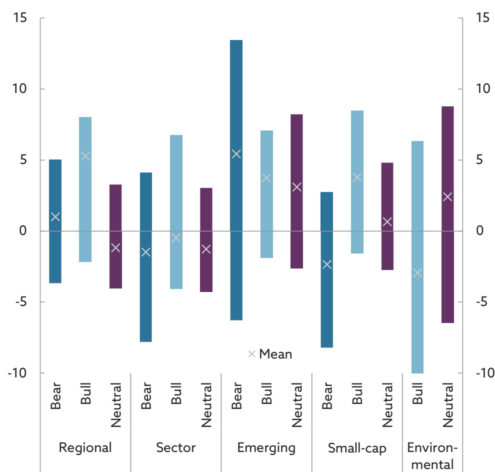


Chart 103 Excess return in market cycles determined by crude oil prices

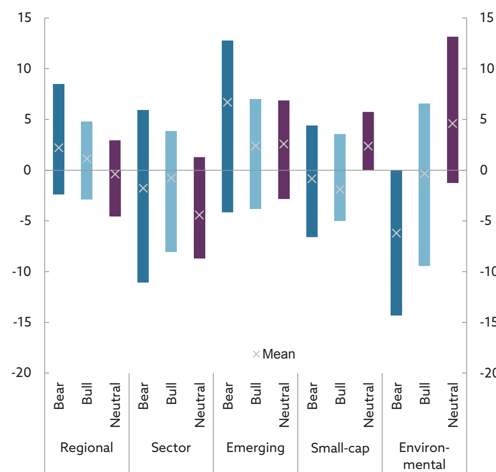


Chart 104 Excess return in periods when emerging markets outperform (bull) and underperform (bear) developed markets

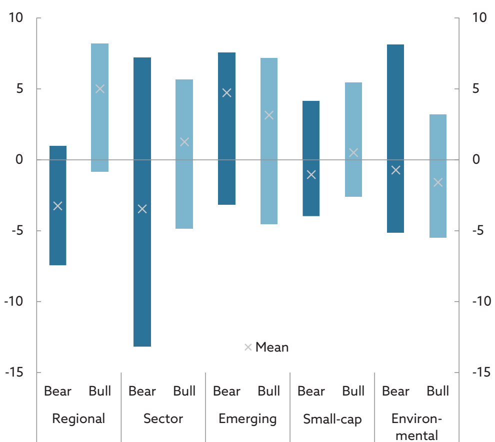
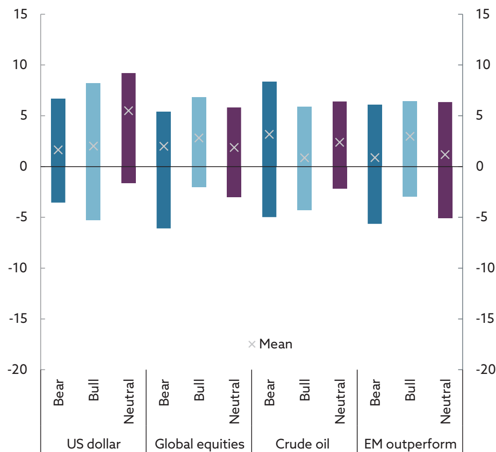


Chart 105 Excess return across all mandates in various market cycles



Performance in rising and falling markets

Another way to examine whether managers' performance is dependent on the general market is to look at each manager's performance versus his or her own benchmark's absolute performance, and see whether excess returns occur more frequently when the manager's market is positive or negative. We look at each month, for each mandate versus its benchmark, and calculate the percentage of times we have gained or lost in months when the market is rising or when the market is falling.

Over the full period 1999-2018, the external mandates delivered excess performance in 59 percent of months. Excess performance was achieved in 63 percent of months when the benchmark was rising, and 55 percent of months when the benchmark was falling. On average, the regional and sector mandates' main contributions to the positive performance were in up-market months, while the emerging markets, developed markets small-cap and environmental mandates' main contributions were when their respective markets fell. Our emerging markets managers are conservative with regards to companies' management quality and balance sheet strength. They have learned through cycles that it is important in these markets to have a focus on environmental, social and governance issues and quality of operations in order to generate a sustainable excess return.

Chart 106 Share of months with excess return in rising and falling markets. Percent

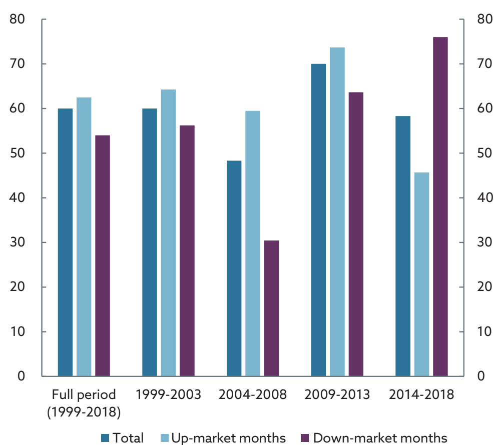
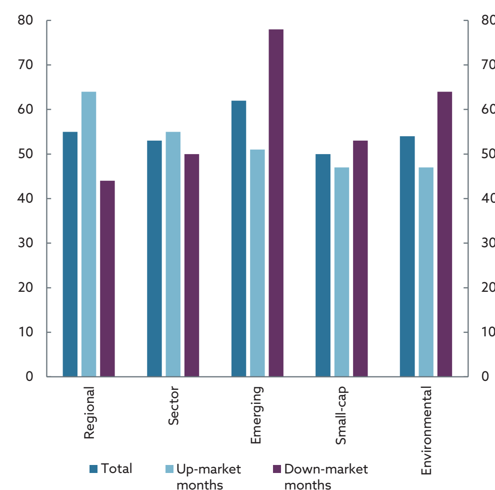


Chart 107 Share of months with excess return in rising and falling markets. Percent



Performance after fees
External managers are remunerated with fees for their services. We aim to buy the best possible product at the lowest possible price.

Since 1998, the number of mandates with some sort of performance-based fee structure has been stable at around 70-75 percent. We prefer this fee structure, as it aligns the asset manager's interests better with our own. Fixed fees have mainly been used for mandates where representative benchmarks are skewed towards a few companies, or where none of the existing benchmarks are applicable, such as in frontier markets and environment-related investments.

Norges Bank Investment Management's fee structure has evolved over time and will continue to evolve to meet the objective of maximising the return on invested fees.

Chart 108 Relative return and fees. Million kroner

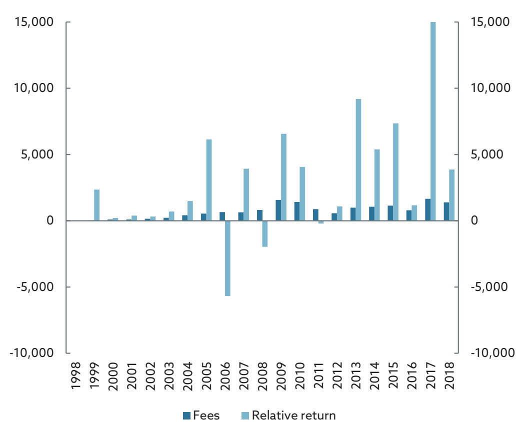
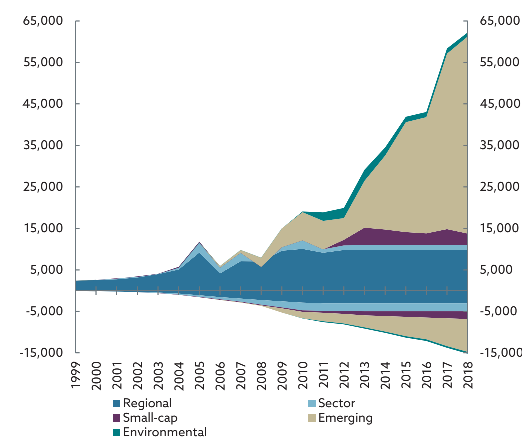


Chart 109 Cumulative excess return and fees. Million kroner



Return on investment

When negotiating with potential external managers, the goal is to maximise our return on the fees we pay. We therefore aim not only to select the best manager, but also to minimise the fee paid for each krone of performance.

Initially, we expected on average to pay 0.40 percent in fees and generate 1 percent in excess return on the assets invested with external managers. That is, we expected to pay 40 percent of the excess return in fees. The reality is that we have paid 0.38 percent in fees, but have generated 2.1 percent in excess performance, which is far more than we expected. Since inception, the fund has retained 82 percent of the percentage excess return generated and 76 percent of the excess return generated in Norwegian kroner, which is way above the 60 percent we initially expected.

Today's investment mandates are purely specialist mandates within narrow investment fields. These specialist mandates are more costly than the more generalist strategies of our early years. The higher fees are in part explained by capacity constraints in these strategies. Only a limited amount of investments can be made in such niche strategies, and competition is fierce for access to these specialist managers.

With a large proportion of external management fees dependent on excess return generated over time, total management costs are thus expected to be higher in years of good performance.

Since 1998, we have on average paid an annual fixed fee of 0.18 percent plus an annual performance-based fee of 0.20 percent.

Chart 110 Fees as share of assets. Percent

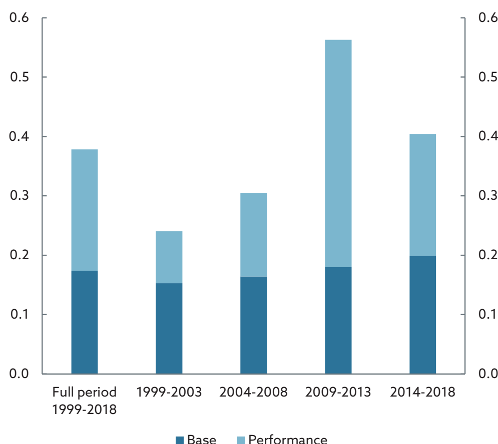
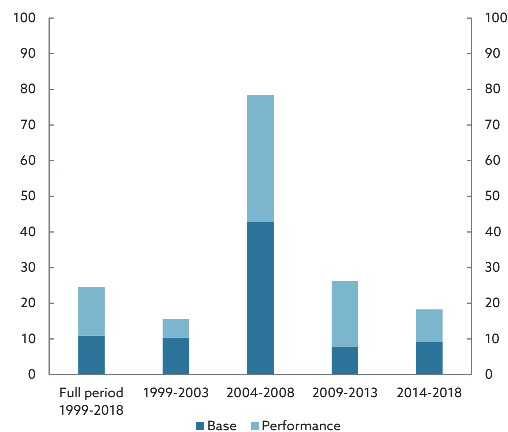


Chart 111 Fees as share of relative return in kroner. Percent



Long-term

When we started out in 1998, the standard performance-based fee schedule was a variation on a 0.20 percent fixed fee and a 20 percent participation rate, with a 1 percent excess return hurdle rate and a 3 percent cap on the fees. The cap is the maximum amount we pay out in a single year to a single manager. The performance part of the fee schedule was based on a rolling 12-month period.

The fixed and performance fees were paid out every quarter except in the first year. No performance fee was paid out for the first three quarters of a mandate; instead, the accumulated performance fee for the entire first year was paid after 12 months of performance was established. For a given year, that meant that the entire performance fee for performance generated the year before was paid out the year after. While this method decreased performance fees over time, it had the unfortunate effect of moving performance fee payments to a different year to the one in which the performance was generated.

As we evaluated the fee schedule, we increased the time period on which the performance fee was based to 36 months. The argument was that the expected annualised relative volatility over a three-year period was only 58 percent of the 12-month volatility. As our expected fee was based on an option-pricing model, lower volatility implied a lower expected fee. The next step in our fee modelling was to scale the participation rate, such that very low excess performance and very high excess performance were given a lower rate, while 2-5 percent excess performance was usually close to a 20 percent participation rate.

Chart 112 Cumulative excess return and fees. Billion kroner

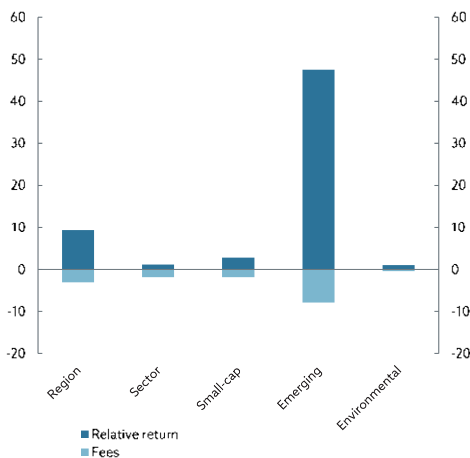
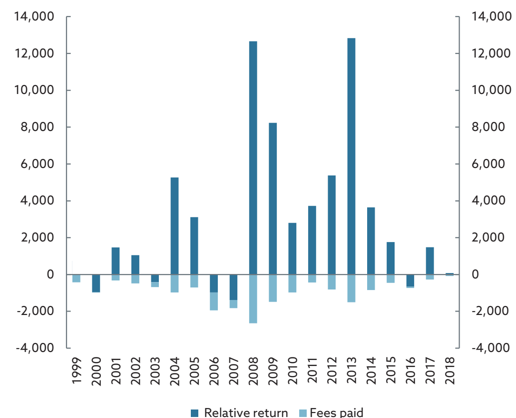


Chart 113 Management fees and relative return by mandate vintage. Million kroner



By 2009, the average performance-based fee schedule had a fixed-fee component of 0.13 percent, while 15 percent of the mandates were based on rolling 12-month performance and 85 percent on 36-month performance. The fixed-fee element was based on a decreasing scale as the mandate size increased, and the performance fee component on a variable scale dependent on the excess performance.

A few situations arose as we moved from broader to more specialised mandates that made us re-think the fee schedule. First, we had excess returns on many portfolios. This led to high fees, as our fee schedule at that time was not suited to the highly volatile specialist mandates.

Second, the new mandates, such as China, Russia or health care, tended to have a higher fee than a US or developed Europe mandate. Furthermore, we were not able to invest as much per specialist mandate as in more broadly diversified developed markets mandates. For example, an Indonesia mandate would never be as big as a developed Europe mandate. This affected average fees negatively, as our fees had a discount based on asset size. The larger the assets, the lower the percentage fee we paid.

Finally, until a 36-month history had been achieved, we measured performance since inception. As the standard deviation is higher over shorter measurement periods, the expected relative performance differential is larger when there is a short time period since a manager was funded. Several of the specialist mandates were quite new, with higher expected volatility and higher expected fees.

Under our new performance fee structure, we have solved this by retaining part of the performance fee earned by the manager in the initial years of a mandate. The way the schedule is structured, the fee not paid out is retained and released as the mandate matures, subject to continued performance. This structure adjusts for the asymmetry between manager and client by putting the retained fee on the line if the manager in the future destroys the value created. Once the mandate is mature, after five years, the pay-out rate rises to 100 percent.

The performance fee is furthermore linked to the whole history of the mandate. If a manager has a period with returns lower than the benchmark, the manager must earn back all of this underperformance before performance-based fees begin to accrue again. It is our intention to reward skill and consistency of excess return, not luck or simply higher market risk.

Finally, all the mandates have a cap on fees. This works similarly to the pay-out rate, in that the manager will have the fee above the cap paid out in subsequent years, unless performance since inception at that point is lower.

Alignment of interests

Many fee schedules promote asset gathering as opposed to value creation. Our current performance fee schedule was introduced in 2011, and one of the main objectives was to align the interests of the manager with our interests as a client. An important aspect in this regard has been to design a fee schedule that optimises the incentive for managers to maximise return without undue risk. Our schedule allows us to pay performance fees only to managers that generate excess returns.

The underlying principle of the performance fee structure is simple. We pay a performance fee on an annual basis based on the value added by the manager since inception. We define the value added as how much the manager has delivered in excess return measured in an agreed currency. This value added is calculated on the basis of the difference between the return on the mandate and the return on a comparable benchmark plus the cost of risk capital. This cost of risk capital is there to reflect the uncertainty in determining whether positive returns close to zero are due to skill or luck. In addition, it creates an adjustment for the asymmetry where managers receive part of the excess return but do not have to pay the client if they do not generate an excess return.

In order not to pay fees on the same performance twice, given that we pay a fee each year for added value since inception, we subtract fees already paid to the manager at the time of the calculation. In the interim quarters, a minimum fee is paid, which we view as a pre-payment of future performance fees.

There are some key reasons why we prefer performance-based fee schedules to fixed fees.

The first is related to principal-agent problems and aligning external managers' interests with our own. One of the problems with fixed fees is that they encourage the manager to keep hold of assets rather than deliver value for the client – the way a manager maximises the fees from a client is to keep the client as long as possible. In a performance fee setting, part of the value created for the client is shared with the manager of the assets. We see this as some of the value created going to the owner of the financial capital and some of the value going to the owner of the intellectual capital. It encourages the manager to do its best to deliver positive returns to the client in a risk-conscious setting.

The second aspect is related to the first, but slightly different. In a setting where the manager receives a higher performance fee from other clients, the manager could have an incentive to pay more attention to those clients' portfolios. This is not a situation that benefits us. It is therefore in our interest to have a low total fee, but a high level of performance participation for the manager. It is also in our interest to align our performance fee as closely as possible with how the specific portfolio manager responsible for our mandate is paid, if possible. Similarly, having a very short-term performance fee is not beneficial for us if the portfolio manager is paid for very long-term performance.

Furthermore, we have seen that performance-based fee schedules are a way to attract the best managers. And finally, we do not like paying fees to managers that have not delivered returns for us.

When we price the expected fees for potential new mandates, we think of performance fee schedules as a typical option-pricing model. Key inputs in this model are the strike price and volatility, in the form of the performance hurdle rate (the excess return the manager needs to generate before a performance fee is paid) and the tracking error for our mandates. Since we calculate the fees at each point along the expected return path and probability-weight them, we have relevant information when negotiating fees.

Fixed fees have mainly been used for mandates where representative benchmarks are heavily skewed towards a few companies, for example in some frontier markets, or for mandates where we expect that our return after fees will be higher with a fixed fee than with a performance fee. A fixed-fee schedule would typically be calculated as a percentage of the assets

managed on our behalf. As we are often a sizeable client, we sometimes have a sliding scale, meaning that fees decrease as a percentage of our assets as our portfolio grows in size.

Excess return does not follow a normal distribution but has long and fat tails, the specialist mandates even more so than the original broader mandates. We therefore had a cap on fees for most of the managers, but not for all. For a few specialist mandates with low capacity and high demand, we had to accept a fee schedule without a cap so that we could reach an agreement. At the time, we did not anticipate extreme excess performance for any of them. During the negotiations, we agreed to forfeit the cap and focus on obtaining a low base fee and a high hurdle rate in order to minimise the expected fees. When one of the managers delivered excess performance of 70 percent from November 2008 to August 2009, we put a cap on the performance fee for that specific mandate in September 2009. By the end of 2009, the manager had generated 1,800 million kroner in excess return and was entitled to 530 million kroner in fees. To avoid similar situations with headline risk and interest from the media, we negotiated a cap in Norwegian kroner on all the mandates. This was also subsequently written into the investment mandate from the Ministry of Finance.

That specific manager has continued to perform very well. After 11 years, the manager has generated 21 percent annualised excess performance and 5.2 times more in excess return than fees paid. In other words, 83 percent has been kept, slightly above the 82 percent average for all mandates.

Chart 114 Monthly relative return all mandates. Frequency. Number of months

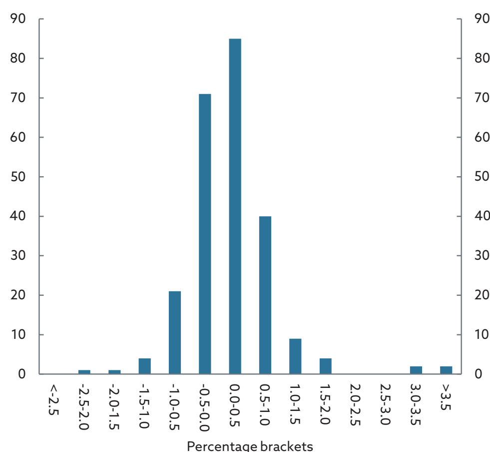
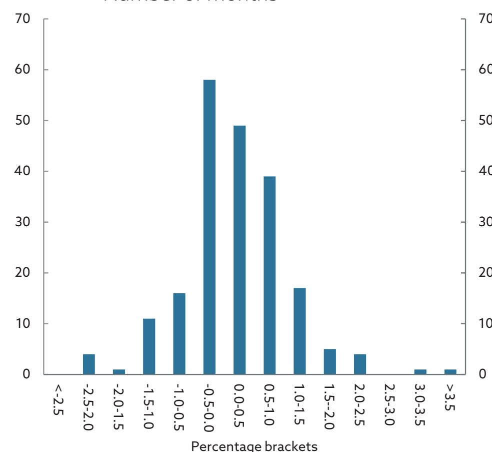


Chart 115 Monthly relative return, emerging markets and small-cap mandates. Frequency. Number of months



Volatility of the portfolio
The excess performance in the period 1999-2018 was good across the different strategies. However, good excess performance comes with a possibility of loss. There will be months and years with significant losses, just like there have been months and years with substantial gains. For each individual manager, we take this into account by measuring performance since inception when calculating fees. For our aggregate portfolio of external managers, we strive to combine the managers in such a way as to maximise the diversification effects for the overall portfolio.

The distribution of excess returns shows that, since inception, we have generated excess performance in 59 percent of the 240 months, with higher gains in the 142 positive months than losses in the 98 negative months. This has been volatile, however. Using the return series for emerging market and developed markets small-cap mandates only, we have had positive returns in 116 months and negative returns in 90 months.

Value at risk does not predict likelihoods, but estimates the potential loss in a given year. The value at risk at a 95 percent confidence level using a parametric normal distribution, based on the monthly return series for all the portfolios since inception, is -1.9 percent. This means that there is a 5 percent chance that we will lose more than 1.9 percent in relative performance in any given year, and a 10 percent chance we will lose more than 1.0 percent. As an alternative, taking into account that the historical numbers are not normally distributed, the empirical value at risk at a 10 percent confidence level is -1.8 percent.

Using only the return series for the emerging markets and developed markets small-cap portfolios, we obtain a value at risk of -2.8 percent with a 95 percent confidence level using a parametric normal distribution. These mandates are more volatile and give a better picture of the probability of loss we face going forward. The historical numbers are not normally distributed, but if we assume they are, there is a 5 percent chance of losing more than 2.8 percent relative return in any given year, and a 10 percent chance of losing more than 1.7 percent.

Safeguard and build financial wealth
We have to be prepared for volatility and variation in the performance of external managers. They have been an essential part of the fund's strategy since inception and made a vital contribution to our excess return, but good performance in the past is no guarantee of continued good result in the future.

External managers have played an important role in fulfilling the fund's objective of the highest possible return after costs within the mandated risk limits. We expect our managers to invest in companies that deliver good returns and at the same time not invest in companies with poor corporate governance or unsustainable business practices. We believe that companies in the latter category have a higher risk of underperforming in the longer term. Our mission is to safeguard and build financial wealth for future generations.

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