IMPLICATIONS FOR THE MANAGEMENT OF THE GOVERNMENT PETROLEUM FUND IF SPECIAL ENVIRONMENTAL CONSIDERATIONS ARE USED AS A BASIS FOR THE CHOICE OF INVESTMENT STRATEGY

Norges Bank submitted the following letter to the Ministry of Finance on 16 March 1999

1. Introduction

The need for applying special ethical criteria as a basis for the choice of investment strategy for the Government Petroleum Fund has been discussed on several occasions. In its letter of 22 April 1998, Norges Bank on a general basis discussed various ways of taking account of ethical factors in the management of the Petroleum Fund. Three different alternatives were discussed: (i) establishing a set of ethical criteria that are used to select those companies in which the Fund can invest, (ii) investing in unit trusts that have well documented ethical guidelines for their investment strategy and (iii) attempting to encourage companies to stress special ethical factors by using the voting rights provided by equities, but without limiting the Fund's investment universe. The submission focused exclusively on the effects of ethical guidelines on the operational management of the Fund. An important conclusion was that whereas the use of voting rights would have a limited impact on the management of the Fund, the exclusion of many companies from the Fund's investment universe might result in substantial costs and make it more complicated to engage in effective management with adequate control and performance measurement.

In the Revised National Budget for 1998, the Government discussed the possibility of introducing guidelines for the Petroleum Fund, with a stronger emphasis on the environment and human rights. The Government stated that such guidelines would have to satisfy the requirements concerning risk diversification, risk management and control and performance measurement of management. Clarity, consistency and practicability were also considered requirements if guidelines that emphasise the environment and human rights were adopted for the Fund. The Government concluded that so far it had not found ways of doing this that satisfy these requirements, but that it would continue its work to arrive at a solution whereby special environmental considerations are used as a basis for formulating the Fund's investment strategy (environmental guidelines). The Government also announced that it would consider expanding the list of countries in which the capital of the Petroleum Fund can be invested, partly because this could make a positive contribution to economic development in countries and thereby promote democracy and human rights.

In this submission, Norges Bank will discuss the consequences of introducing guidelines for the Petroleum Fund. In another submission, the Bank will look more closely at the requirements that must be met if new countries are to be included in the Fund's investment universe.

Norges Bank has two functions in relation to the management of the Petroleum Fund. First, the Bank is responsible for the operational management of the Fund. Furthermore, the Bank provides advice on how the Fund's investment strategy should be designed. If the Government decides to introduce environmental guidelines for the Petroleum Fund, this may result in changes in both the investment strategy and operational management. In this submission, we will examine how the investment strategy can be designed and how the operational management can be implemented if such guidelines are introduced for the Fund.

In the discussion below, particular emphasis is placed on the requirements set out by the Government for environmental guidelines with respect to control and performance measurement, risk diversification, clarity, practicability and consistency. Norges Bank is of the view that it is absolutely necessary to establish such requirements for these guidelines. However, as will be seen in the following, it is difficult to satisfy these requirements, partly because it is very difficult to obtain comparable environmental information on all the companies in which the Petroleum Fund can invest (around 20 000 companies in 21 different countries). Moreover, it is pointed out that environmental guidelines that limit the Petroleum Fund's investment opportunities might have a substantial impact on the Fund, partly because a tailored benchmark index for the Fund would have to be defined. This would increase the costs of management, and make it more difficult to evaluate Norges Bank's management. In addition, it would increase the Fund's risk because investments would have to be spread among a smaller number of equities. If it is decided to introduce environmental guidelines for the Petroleum Fund, it is also important to be aware of the practical problems associated with formulating clear and consistent rules. For example, environmental criteria will often require a considerable degree of discretionary assessments when selecting those companies that satisfy the criteria. Norges Bank does not possess the expertise for making such evaluations.

A key question is whether environmental guidelines for the Petroleum Fund will have positive effects on the global environment. In principle, such effects would be expected if the guidelines are relevant to the purpose and also entail that companies that do not satisfy the criteria must pay a higher price for raising equity capital than others. This would give companies an incentive to work more on environmental issues. Given the size and liquidity of international stock markets, however, it is very uncertain whether the introduction of environmental guidelines for the Petroleum Fund would have any effect. It is more likely that an effect will be seen if many investors use the same environmental criteria, but we do not know whether other investors will do so. Consequently, it is uncertain what effect a decision that limits the Petroleum Fund's investment options will have on the global environment.

In the final evaluation of environmental guidelines for the Fund, any positive environmental effects would have to be weighed against the effect on risk diversification, management costs, control and performance measurement of management. An assessment should also be made of whether there are other instruments that may be more effective for achieving the environmental objectives of the authorities. In this connection, it is also a question of whether it shall be taken into account that the public sector already has ownership interests in a large number of companies engaged in different types of business activities. It may, for example, appear reasonable to impose the same requirements on Norwegian enterprises that are owned by the state as for the Petroleum Fund's investments in foreign equities.

It is the Ministry of Finance that must assume responsibility for the work on environmental guidelines. This means, among other things, that the Ministry must define an investment universe and a benchmark portfolio for the Fund that are consistent with the environmental guidelines. A well defined investment universe and a precise benchmark portfolio are preconditions for being able to evaluate Norges Bank's management of the Fund.

It is important to avoid continuous changes in the guidelines for the Petroleum Fund, because the Fund is so large that even small changes in the guidelines might result in considerable transaction costs. In the view of Norges Bank, the need for stability and a long-term approach in the management of the Fund will also apply to environmental guidelines.

Environmental guidelines can be implemented in several ways. The guidelines can apply to a small portion of the Fund or the entire Fund, and the criteria may be used to select some companies or a large number of companies. The following discussion of principles applies irrespective of the solutions chosen, but the importance of the consequences that are discussed will naturally vary somewhat between the various alternatives.

In the following, we focus on the implications of environmental considerations for the Petroleum Fund's investment strategy and the operational management of the Fund. Most of the analyses and results that are presented, however, are generally valid even if it is found desirable to take other considerations of an ethical nature into account in the management of the Fund.

2. The current investment strategy

According to the Act of 22 June 1990 relating to the Government Petroleum Fund, the Ministry of Finance is responsible for the management of the Fund. Consequently, the Ministry is responsible for defining an objective for the management of the Fund and an investment strategy that is consistent with this objective. The Ministry of Finance has defined the Fund's objective as the highest possible financial return without excessive risk. In order to promote the objective of a high financial return, it has been decided to invest portions of the Fund's capital in equities. With regard to risk considerations, the Ministry has attached importance to a broad diversification of the Fund's investments. It was therefore decided to distribute the investments among 21 different countries and ensure that within each country investments were spread among a large number of equities and bonds.[1] As a result of this strategy, the Fund's capital is now invested in more than 2 000 equities throughout the world. This diversification of the Fund is also consistent with the objective that the Fund shall be a financial investor (cf §10 of the Regulation on the Mangement of the Government Petroleum Fund, 3 October 1997).

The Petroleum Fund's investment strategy is reflected in the benchmark portfolio that the Ministry of Finance has selected for the Fund. This portfolio has two important functions in the management of the Fund. In addition to reflecting the investment strategy, the benchmark portfolio shall also be used to assess management performance. It is therefore important that this portfolio is constructed on the basis of clear and objective criteria. The Petroleum Fund's benchmark portfolio is composed of market indices that recognised institutions have developed for equity and bond markets in various countries. There are several advantages associated with using these indices. First, considerable resources have been used to construct the indices to make them representative of the markets covered. Second, the companies included in the indices are weighted in accordance with their size (market capitalisation weights), and this is considered to be an appropriate method for spreading equity exposure. Third, the market indices are reliable since they are publicly available and their construction is well documented. Moreover, the index suppliers calculate daily returns, which is necessary for the ongoing control and performance measurement of management of the Fund.

In addition to selecting a benchmark portfolio, the Ministry of Finance has established limits for the degree to which Norges Bank can deviate from this portfolio, and has defined an investment universe for the Fund. With regard to the investment universe, the Ministry has emphasised that the Fund shall only be invested in countries with liquid and smoothly functioning financial markets with sound company, stock exchange and securities legislation. For the Fund's equity investments, this means that the Fund can choose from about 20 000 companies that are listed in countries in which the Fund's capital can be invested. This investment universe gives Norges Bank the opportunity to carry out cost-effective index management for a large portion of the Fund, and it also provides sufficient flexibility for the portion of the Fund that is subject to active management. This increases the likelihood that the Bank, through its management, can generate an excess return relative to the benchmark portfolio.

The Ministry of Finance's formulation of the investment strategy for the Petroleum Fund gives Norges Bank a clear mandate for the management of the Fund. According to the Regulation on the Management of the Government Petroleum Fund, Norges Bank shall seek to achieve the highest possible return for the Fund within the limits set out in the Regulation (§2). The limits are set in the form of permitted deviations from the Fund's benchmark portfolio. This clear mandate makes it possible to evaluate the quality of Norges Bank's management. This may be accomplished, for example, by comparing the return on the Fund with the return on the benchmark portfolio. Since the Bank is measured against recognised benchmark indices that are also used by other managers, it is also possible to compare the Bank's management with the management of other investors.

3. Environmental guidelines and investment strategy for the Petroleum Fund

The introduction of environmental considerations in the management of the Fund involves the introduction of a new objective for this management. In addition to the financial return and risk, an objective that relates to environmental issues must also be defined. It is the political authorities that must specify what this objective shall be and the emphasis it shall be given compared with the other objectives for the management of the Fund. When this has been accomplished, it is necessary to define an investment universe and a benchmark portfolio that reflect the change in the objective of the management of the Fund. This is necessary to

[1] The countries are: Canada, the US, Belgium, Denmark, Finland, France, Italy, Ireland, the Netherlands, Portugal, Spain, the UK, Switzerland, Sweden, Germany, Austria, Australia, Hong Kong, Japan, New Zealand and Singapore.

permit continued evaluation of Norges Bank's management of the Fund.

Environmental guidelines

It has gradually become more common for investors to attach importance to considerations of an ethical or social nature when drawing up their investment strategies. This approach has come furthest in the US and the UK, but investors in other countries have also begun to place greater emphasis on such considerations in their choice of investment strategy.[2] According to the Social Investment Forum, which is an interest group in the US for investors who want an ethical investment strategy, its members consist of private individuals, companies, universities, hospitals, pension funds, religious institutions and other non-profit organisations. The ethical criteria that are most widely used in the US market relate to tobacco, gambling, arms, alcohol and the environment. With regard to environmental criteria, there are basically three different reasons why investors want to use such criteria when drawing up their investment strategy.

The first reason is that some investors want to change corporate behaviour in a more environment friendly direction. This can be done in two ways. One way is to use ownership interests provided by equities to influence the companies either by voting at general meetings or through talks with corporate management. It appears that an increasing number of investors are using their ownership interests in this way, and there are indications that such behaviour is actually influencing corporate activities.[3] The second way is to confine investments to companies that satisfy special environmental criteria. Those companies that do not satisfy the criteria are thereby given an incentive to improve their activities. The effect this has on companies is discussed in the literature.[4] A key issue is whether the company's funding costs increase if some investors refuse to invest in the company. This will in turn depend on the degree to which the markets for the company's shares are smoothly functioning and liquid and how many investors react in the same way. It is therefore difficult to comment in general on how not investing in some companies affects companies' environmental efforts. It is, however, worth noting that the markets in which environmental analyses of companies are most common are the same markets that are considered to be the most smoothly functioning in the world (the US, Canada and Europe). There is thus little [illegible]on to assume that the introduction of environmental guidelines for the Petroleum Fund in th[illegible]rkets will, in isolation, have any impact.

The second reason that investors take environmental considerations into account is either that they do not want to be associated with environmentally harmful activities or that they want to support firms that introduce positive environmental measures. This justification is not dependent on the measures having any effect on the activities of the companies, but rather to demonstrate an attitude towards the environment. This can also be accomplished through a deliberate choice of companies for investment purposes.

The final reason that managers take environmental considerations into account in their investments is that some are of the view that this will contribute to ensuring a high return on equity investments. The idea is that companies that take environmental issues seriously are engaged in forward-looking activities that, over time, will result in a high return for investors. It is difficult, however, to find empirical support for this view. The analyses we are aware of conclude that selecting a limited number of companies based on special environmental criteria does not have a systematic effect on the return of an equity portfolio.[5] If it is decided to exclude a large number of companies or all companies in some industries, it is difficult to assess the effects on the return. The reason is that the portfolio will then have features that deviate considerably from the features of a portfolio that is not subject to environmental criteria. The return on the portfolio will

[2] Social Investment Forum estimates that about 4 per cent of all management in the US is based on special ethical guidelines. In addition, there are many investors who in ethical questions make use of voting rights provided by share ownership (these manage about 5 per cent of the total capital).

[3] See James Angel and Pietra Rivioli: "Does Ethical Investing Impose a Cost Upon the Firm? A Theoretical Examination", Journal of Investing, Winter 1997.

[4] See Wallace Davidson, Dan Worrell and Abuzar El-Jelly: "Influencing Managers to Change Unpopular Corporate Behaviour Through Boycotts and Divestitures", Business and Society, August 1995.

[5] See Laura Gottsman and Jon Kessler: "Smart Screened Investments: Environmental Screened Equity Funds that Perform Like Conventional Funds", The Journal of Investing, Fall 1998.

therefore vary considerably in relation to the return on the benchmark index. This makes it difficult to evaluate whether there are any systematic differences in returns. In this situation, data on returns for many years will be required before it is possible to draw a conclusion, but so far such data are not available. Limitations on the Fund's investment options will, however, result in a poorer trade-off between return and risk. A poorer trade-off means that for a given return, the risk will increase. How much more unfavourable this trade-off will be will naturally depend on the extent of the limitations imposed on investment options.

The discussion above shows that it is difficult to justify environmental guidelines on the basis of return considerations. If environmental guidelines are to be introduced for the Petroleum Fund, the justification must consequently be that (more passively) one wants to demonstrate an environmental standpoint or (more actively) one will attempt to influence companies to work more seriously on environmental issues. If the reason is that one wants to actively attempt to influence companies, it is necessary to evaluate whether it is the use of voting rights or the selection of companies that has the greatest impact on companies' environmental efforts. Another question is whether, in making this choice, account shall be taken of what the state is doing in other areas. The state already has ownership interests in a number of Norwegian enterprises, and it must be appropriate to select a system for the Petroleum Fund that is also applied to these enterprises.

If one wishes to promote environmental considerations by selecting companies on the basis of environmental criteria, it is necessary to determine the criteria to be emphasised. This again is a question of the purpose of introducing environmental guidelines. There is an important distinction between negative and positive environmental criteria. With the use of negative criteria, companies that engage in activities that are considered environmentally harmful are excluded. This can be done either by excluding all companies in the least environment-friendly industries, or by selecting those companies that pollute the most in each industry. Positive criteria entail that only companies that have excelled in some way through their work on environmental issues are selected. This can occur if the company has received environmental certification or drawn up an extensive environmental report. Previously, it was most common to only use negative criteria, but in recent years many investors have chosen to make use of a combination of positive and negative criteria. The use of only positive criteria is not particularly widespread. In any event, the criteria must be such that determining whether a company satisfies the criteria or not is relatively simple and clear-cut.

When the Fund's environmental objective has been defined, the emphasis this objective shall be given in relation to other objectives, such as the return and risk, must be determined. Before considering this question, it is necessary to determine to what extent there may be a conflict between the various objectives. When using voting rights, it is unlikely that such a conflict will arise since there will be no limitations concerning the companies in which the Fund can invest. If companies are selected on the basis of environmental considerations, there will be a conflict in particular between the environmental considerations and the need to reduce the Fund's risk by spreading investments among a large number of equities. The degree of importance to be attached to environmental considerations in the management of the Petroleum Fund will be a result of striking a balance between these two considerations.

After clearly defining the objective of introducing environmental considerations, the next stage will be to draw up an investment strategy that is consistent with this objective. If environmental criteria are used for selecting those companies in which the Fund can invest, the Fund's current investment strategy must be changed. The following section focuses on the work this will entail. It may be added here that if it is decided to safeguard environmental considerations by using voting rights, the investment strategy will not have to be changed. In the management of the Fund, the benchmark indices and the same investment universe used today can continue to be applied. However, the Ministry of Finance must draw up guidelines that show how the Fund shall vote on various issues. It is important that the guidelines are precise and that they explicitly deal with how voting rights shall be used in various questions that may have a bearing on the environment. Moreover, a system is required for translating these guidelines into the active exercise of voting rights. It may be very demanding to develop a system for this.

However, there are consulting firms that have specialised in systematising information on the proposals to be considered at companies' general meetings. Voting will be considerably simplified by subscribing to these companies' databases, analyses and software. Norges Bank's submission of 22 April 1998 provides a further discussion of the use of voting rights.

The Petroleum Fund's investment universe

Environmental criteria can be used in two ways. The first is to construct tailored equity portfolios that take into account the environmental criteria selected. The second is to invest in unit trusts that apply environmental criteria. In the submission of 22 April 1998, it is argued that tailored portfolios have several advantages over unit trusts. First, the environmental considerations considered important can be safeguarded more precisely when the investor determines the criteria to be used. Second, the costs of investing in unit trusts are considerably higher than own management. Moreover, unit trusts that apply environmental criteria are small compared with the Petroleum Fund. As a result, the Petroleum Fund might be a dominant investor in these funds, which may make it more difficult to avoid undue market influence when buying or selling units in unit trusts. In the following, we will therefore concentrate on the work of constructing tailored equity portfolios based on environmental criteria.

When the list of desired environmental criteria has been defined, the various companies must be evaluated in terms of these criteria. This requires knowledge concerning each company's activities. The task of gathering this information requires considerable resources. The Fund's investment universe consists of about 20 000 companies, and it will be virtually impossible to maintain a database with environmental information on so many companies. It is therefore necessary to delimit the investment universe considerably if environmental criteria are introduced for the management of the Petroleum Fund. One way of doing this is to start with the companies that are included in the Fund's benchmark portfolio, which consists of 2 000 companies in 21 different countries. Satisfactory environmental information is available in many of these countries, particularly in Asian countries. This means that the work on environmental guidelines must primarily be concentrated on approximately 1 400 companies that are included in the benchmark indices in Europe, the US and Canada. These stock markets cover 80 per cent of the Fund's equity investments, and the companies in the benchmark indices also represent about 85 per cent of each country's stock market measured by market capitalisation. In addition, it will be possible to obtain environmental information on a limited number of companies outside the benchmark indices. This implies that the environmental guidelines may cover an important portion of the Fund's investment universe. It is, however, worth noting that the companies that are initially covered by environmental analyses only constitute a small share of the total number of companies that are currently part of the investment universe. When, in addition, the companies that do not satisfy the criteria are eliminated, it is obvious that the environmental guidelines will entail a considerable reduction in the Fund's investment universe. This change in the investment universe may have implications for both risk and management costs. This is discussed later in this submission.

Even if it is decided to concentrate the work on environmental guidelines on the approximately - 1 400 companies in the Fund's benchmark index in the US, Canada and Europe, it will be very demanding to build up and maintain an environmental database on our own for such a large number of companies. However, there are consulting firms that have specialised in gathering environmental information on companies in these countries. In the work on environmental guidelines it may therefore be natural to use the databases developed by these consulting firms. It is uncertain, however, whether these databases contain the information that is most relevant in terms of the specific environmental considerations to be taken into account.

The consulting firms that have specialised in collecting environmental information on companies' activities primarily use two sources. The first consists of public registers that contain information on companies' emissions and any environmental penalties. The second source is information provided by the companies themselves. This information is obtained by reading annual reports, by sending companies questionnaires or by directly contacting the companies.

Negative environmental criteria are normally related to conditions that can be quantified and where public registers provide satisfactory quality assurance of the data. Nevertheless, it is no simple matter to use such criteria. The reason is that the information on, for example, the absolute level of emissions of a company is of limited value. It is more relevant to focus on environmental efficiency in the companies' production processes by looking at the relationship between emission volumes and production volumes. However, since it is difficult to obtain information that shows the relationship between production volumes and emissions for the various production processes, it is difficult to measure environmental efficiency in a satisfactory way. Another negative environmental criterion that can be used is whether or not environmental penalties have been imposed on the company. This criterion, however, also raises a number of discretionary questions: How can one deal with the fact that countries have varying practices with regard to environmental penalties? In some countries it may be necessary to set a lower limit for the size of the environmental penalty to avoid excluding many companies, but what should this limit be? Shall special requirements be established for the level of government that has imposed the penalty? Environmental penalties will also apply to past conditions and do not necessarily provide an indication of existing conditions in the company. The discussion in this section shows that even though much of the environmental information can be objective, its interpretation may be subjective.

Positive environmental criteria are often more qualitative than the negative criteria. Many of the positive criteria will therefore involve a greater element of discretionary evaluations when they are used. Some examples can illustrate this. A positive criterion that is used is whether the company produces an environmental report, although the requirements that must be fulfilled before one can say that the company has such a report are not obvious. Another positive criterion is whether the company has environmental certification (for example, ISO 14001). The problem with this criterion is that the certification does not apply to the company, but rather a production process in the company. The use of this criterion therefore raises a number of questions: Must all production processes be certified before it can be said that the company is? What requirements shall be imposed if the company has many subsidiaries? Should all these subsidiaries be certified before one can say that the company has environmental certification? How shall one deal with companies in industries where environmental certification is not so widespread (such as some service industries)?

As the consulting firms will play a key role in the work on environmental guidelines, it is important to make a thorough evaluation of these firms. The analyses carried out by the consulting firms may have considerable effects on equity exposure in the Petroleum Fund, and these firms must be subject to the same requirements concerning quality and reliability as those who execute the operational management. In evaluating the firms, it is important to examine more closely the sources they use, how the information is analysed, how the firms are organised, the firms' resources and whether the activities of these firms in other areas (such as their own equity management) will result in conflicts of interest. It is also worth noting that the market for this type of service is limited. If if turns out that the consulting firm cannot supply a product of sufficient quality, there are few alternative firms to use.

One general problem with using environmental criteria is that it requires a good overview of those activities in which the companies are involved. However, in the case of large multinational companies with ownership interests in companies in a number of countries, it may prove difficult to obtain this overview. It would also be necessary to decide how large an ownership interest, if any, a company may have in a company that does not satisfy environmental criteria before the proprietary company is also disqualified. Another problem is that no national or international standards have been devised for companies' environmental reporting. The result is that it may be difficult to obtain comparable environmental information on companies from different countries. Another factor is that the environmental criteria that can be used will be determined by the information that can be gathered by the consulting firms. This means that one cannot freely choose environmental criteria.

The Revised National Budget for 1998 states that the environmental criteria must be objective and easily identifiable. The discussion above shows that it will be difficult to find environmental criteria that satisfy this requirement. Efforts are being made, however, to improve the quality of companies' environmental reporting, and in recent years two global programmes that are examining this more closely have been established. Global Partner Working Group is a joint project with consulting firms in various countries that have specialised in gathering information on companies' activities. The aim of this project is to coordinate and standardise the analyses of companies internationally. Global Reporting Initiatives (GRI) is a cooperation between companies and interest groups from a number of countries for establishing an international standard for companies' environmental reporting. As both these programmes are in a start-up phase, it is too early to evaluate their impact. However, it seems likely that in the long run they will make it easier to apply environmental guidelines systematically and consistently across countries. These two initiatives are also interesting for managers that do not focus on environmental considerations. Obtaining more information on the environmental aspect of companies' activities may also improve the quality of financial analyses of companies. There are consequently a number of reasons why the ongoing work of coordinating and standardising companies' environmental reporting is positive.

Two solutions regarding the actual process of selecting companies on the basis of environmental criteria are conceivable. The first is subscribing to the consulting firms' databases, but that we ourselves determine those companies that satisfy the environmental criteria. The second is to give the environmental criteria to the consulting firms, and ask them to select the companies. In the US, most investors have opted for the first solution, while the second solution seems to be most widespread in the UK. Irrespective of the solution chosen, it is important that precise environmental criteria are drawn up and that there is a system which makes it possible to continuously evaluate the problems that might arise when the criteria are to be applied. As the work will require professional environmental insight and entail policy priorities, this cannot be a task for Norges Bank.

The work on selecting companies on the basis of environmental criteria will result in a list of companies that satisfy the criteria. This list will represent the Fund's investment universe in the countries concerned, and serve as a basis for the construction of benchmark indices.

Benchmark indices

The current benchmark indices for the Petroleum Fund's equity investments are the Financial Times/Standard & Poor's index. Norges Bank has discussed with the supplier the possibility of constructing and maintaining a tailored index for the management of the Petroleum Fund based on a list of companies that satisfy the environmental criteria. The main conclusion is that the supplier is willing to do this. The tailored indices can be delivered with the same frequency and level of detail as the official indices. This will, however, require greater resources on the part of the index supplier and thereby a higher fee.

On the basis of the official benchmark indices and a list of companies that satisfy the environmental criteria, the index supplier will be able to construct tailored benchmark indices for the Petroleum Fund. These benchmark indices will have two important functions. First, they will serve as the basis for the evaluation of Norges Bank's management. Second, the indices will make it possible to study the impact of the environmental criteria. The latter can be accomplished by comparing the return on the official indices with the return on the tailored indices. This is possible as long as the differences between the two types of indices can be exclusively ascribed to the implementation of environmental criteria. This requires, however, a continuous evaluation of companies that at irregular intervals are included in the official indices. This can take place with as little as four days' notice. During this period, it is therefore necessary to clarify whether the company satisfies the environmental criteria or not. An alternative, of course, is that the composition of the tailored index is kept stable over a longer period (quarter or year). The disadvantage of this approach is that the possibility of evaluating the effect of the environmental criteria is lost as the difference between the official indices and the tailored indices is no longer solely due to environmental criteria, but also varying frequencies for updating the indices.

In Europe, the US and Canada it is realistic to assume that all companies in the Fund's benchmark indices can be assessed on the basis of the criteria. As the Fund's capital gradually increases, however, the applicable benchmark indices may not provide a sufficient spread of the Fund's investments. It may then be appropriate to use benchmark indices that contain more companies than the existing benchmark indices. If this occurs, it may prove difficult to apply the environmental criteria to all companies in the indices. The tailored indices will then acquire features that deviate substantially from the official indices, and it will no longer be possible to evaluate the effects of environmental guidelines by comparing the return on the official indices and the tailored indices.

There are two ways of constructing tailored benchmark indices for the Petroleum Fund based on the companies that have satisfied the environmental criteria. The first is to use market capitalisation weights so that when some companies are removed from an index the remaining companies will be weighted on the basis of their size. The second is to weight the remaining companies so that the features of the equity index are as similar as possible to the features of the benchmark index. This can be done by giving a higher relative weight to companies with features that are closely correlated with the features of companies that do not satisfy the environmental criteria. Two objections can be raised to constructing equity portfolios in this way. First, it may result in substantial transaction costs since the equity composition which makes the portfolio similar to the benchmark index can change over time. Second, it will be more difficult to ascertain what is achieved through the use of environmental guidelines. The reason is that when a company is removed because much of its activity is of a polluting nature, attempts will be made to invest more in companies that are engaged in closely related activities but which still satisfy the environmental criteria. Norges Bank will therefore recommend the use of market capitalisation weights if tailored benchmark indices are to be constructed.

Implications of environmental guidelines

The implications for the Fund's return and risk figure prominently when evaluating to what extent environmental guidelines should be introduced. We argued earlier that environmental guidelines will not necessarily have a systematic impact on the Fund's return, but that the Fund's risk will increase. In order to shed light on the increase in risk, Norges Bank was commissioned by the Ministry of Finance to make a study in which examples of equity portfolios that applied environmental considerations were constructed.

Norges Bank decided to focus on equity markets in the UK, the US and Canada. These markets were selected because there were consulting firms in these three countries that had (i) long experience in constructing equity portfolios that apply environmental considerations and (ii) a database with environmental information covering nearly all companies in the Petroleum Fund's benchmark index in these three countries. Various sets of environmental criteria were used: one set with negative criteria (certain types of pollution and environmental penalties) and one set with positive criteria (environmental certification and environmental reports). The results from the US and Canadian stock markets were very similar. It is therefore more interesting to compare the results from the UK and US markets:

i) The negative criteria entailed the exclusion of about 25 per cent of companies from the benchmark index in both markets. However, particularly large companies were eliminated in the UK market, with the result that the tracking error[6)] was higher in this market (3.36% compared with 1.67% in the US market).

ii) The positive criteria produced very different results in the two markets. In the US market, 90 per cent of the companies were eliminated from the benchmark index, while in the UK market the figure was 25 per cent. This difference also had an impact on the tracking error, which was 6.65% in the US market and 1.42% in the UK

iii) In the UK market, approximately the same number of companies were eliminated when positive criteria were applied as when negative criteria were used. In both cases about 50 of the 207 companies included in the British benchmark index were excluded. In the two groups with companies that were excluded through negative and positive criteria respectively, there were only three companies that were represented in both groups. This demonstrates that the use of negative or positive environmental criteria will have a considerable influence on the remaining equities.

6) Tracking error is a measure of how much the return on a portfolio can be expected to deviate from the return on the benchmark index. A tracking error of 2 per cent means that the actual return will, with a very high degree of probability, lie within an interval of +/- 4 per cent around the return on the benchmark index.

These results show that the implications of introducing environmental criteria depend both on the criteria used and how these are interpreted in the various markets. It is therefore difficult to comment in general on how much the Fund's risk will increase if environmental criteria are introduced. There is no doubt, however, that the Fund's risk will increase when limitations on the Fund's investment options are imposed.

4. Management with environmental guidelines

The Petroleum Fund will gradually become a fund of considerable size, also in an international context. As a result, the operational management of the Fund will be facing challenges that are otherwise not common in Norwegian fund management. Norwegian unit trusts usually invest in a limited number of companies with the aim of achieving a high return. The same strategy for the Petroleum Fund would rapidly come into conflict both with the objective of low costs in the establishment of the Fund's portfolio and with the requirement that the Fund shall be a financial investor that shall have limited ownership interests in any one company. Norges Bank has chosen a combination of index management and active management in order to achieve the objective of cost-effective excess returns, and the main emphasis has been placed on index management.

Index management means that investments are made in a portfolio which, to the greatest possible extent, reflects the benchmark portfolio in order to achieve a return that is as close as possible to the return on the benchmark portfolio. This type of management is particularly attractive for a large fund like the Petroleum Fund because management and transaction costs associated with index management are very low.

Furthermore, a portion of the Fund's equity investments is set aside for active management. The objective of active management is to outperform the benchmark portfolio. Active managers will select equities that are expected to provide a higher financial return than the benchmark portfolio. The actively managed portion of the Petroleum Fund will therefore contain a smaller number of equities than well diversified index management.

Index management as the core of a large equity portfolio ensures better management of risk and costs and is an important precondition for the effective use of active management. Even though the relationship between passive and active management will not remain constant, this model will continue to be the core of the management also in the future.

Operational implications of environmental criteria

The introduction of environmental criteria for the management of the Petroleum Fund will not change the management model for equity investments. It will be possible to continue both index management and active management based on a new benchmark index and a well defined investment universe. However, there are costs associated with both the immediate change in the Fund's actual investments as a result of a new benchmark index and a different investment universe, and higher costs linked to the management of equity investments. Index management based on a tailored benchmark index will make it more difficult to achieve the appropriate market exposure in a cost-effective manner. It is also reasonable to assume that the possibility of generating an excess return through active management will be reduced if a substantial part of the investment universe is eliminated.

Investments through the use of futures contracts are as a rule the most cost-effective way of achieving the desired market exposure. The use of such contracts is particularly useful when new capital is transferred to the Petroleum Fund. By using futures contracts the shift to equities can take place with the help of internal trades between index managers, over a longer period and at low costs. The alternative to futures contracts is either higher costs because a large volume of equities must be traded quickly, or higher risk in management because the right market exposure is not achieved swiftly enough. The return on futures contracts reflects the return on all the equities included in the indices for which the futures contracts are traded. By taking positions in futures contracts the Petroleum Fund can benefit from the return on companies that will not be a part of the Petroleum Fund's investment universe if environmental guidelines are introduced. With a narrowing of the Fund's investment universe, it is therefore necessary to clarify whether futures contracts for official equity indices may continue to be used in management.

The establishment of a tailored benchmark index will result in greater deviations between the futures contracts used to achieve market exposure and the market exposure actually desired. This means that the risk associated with daily management of the Petroleum Fund will increase. The more companies in each market that are excluded from the tailored benchmark index, the greater the problems will be.

The costs associated with a change in the benchmark portfolio relate to the need to sell portions of the current portfolio when companies are eliminated from the investment universe and capital is reinvested in the new benchmark index. The possibilities for executing these transactions outside stockbroking companies, with the help of internal trades of equity portfolios by index managers, will be limited because in this case the portfolios will not be the same as those held by other large investors. The execution of such transactions in the stock market may therefore involve considerable costs.

If some of the larger companies in the existing benchmark portfolio are eliminated, the liquidity of the remaining equities in the benchmark portfolio will be reduced. Liquidity is a measure of how costly it is to execute transactions. Reduced liquidity will involve higher transaction costs when new capital is transferred to the Petroleum Fund. The low costs of index management are partly based on index managers' opportunities to acquire the equities by exchanging portfolios internally, without using external stockbroking companies. If a tailored benchmark portfolio deviates substantially from the official indices, the possibility of using such trades is reduced, and transaction costs increase.

The purpose of active management is to use extensive analysis and market know-how to invest in companies that over time are expected to provide a higher return than the benchmark portfolio. It may be more reasonable to assume that this analysis and market insight can generate excess returns in those parts of the market that are outside the benchmark portfolio because these have presumably been analysed less and because they are part of a less efficient market. A review of the Petroleum Fund's active equity investments shows that between 10 and 20 per cent of the investments are made in companies that are not part of the benchmark portfolio. A reduction in the investment universe therefore entails that active managers would be forced to select investments which they are not convinced will provide an excess return. The value of the extensive analysis that is made of various investment alternatives thereby declines and the possibility of generating an excess return is reduced

5. Concluding remarks

To what extent environmental guidelines should be introduced for the Petroleum Fund is a question of what the objective of Fund management shall be. It is the political authorities that must decide how and to what extent such guidelines shall be introduced. In this submission, Norges Bank has attempted to shed light on the implications of environmental guidelines for the design of the investment strategy and the operational management of the Fund.

If one wishes to implement environmental guidelines for the Petroleum Fund, this must be done with a view to maintaining the clear division of responsibility between the Ministry of Finance and Norges Bank. This implies, for example, that the Ministry must define an investment universe and a benchmark index that are consistent with the environmental guidelines. If it is decided to use voting rights, no changes in the investment universe and benchmark index are required. If, on the other hand, companies are to be selected on the basis of specific environmental criteria, both the investment universe and the benchmark index must be adjusted. A well defined investment universe and a precise benchmark portfolio are preconditions for permitting sound control and performance measurement of Norges Bank's management.

Norges Bank's work on constructing examples of equity portfolios that apply environmental criteria has provided useful insight. An important lesson was that the choice of environmental criteria has a considerable effect on which companies are excluded from the investment universe. The analyses of the UK stock market showed, for example, that the use of positive criteria would result in higher investments in those industries which, when applying negative criteria, implied lower investments. Another important lesson was that the same environmental criteria produced different results in different countries. This shows that the criteria selected and the interpretation of them may have considerable implications for the composition of the Petroleum Fund's equity portfolio. The work on selecting environmental criteria that can be applied in a consistent and objective manner across countries is therefore a difficult task.

The operational management of the Fund will be influenced if environmental criteria are introduced. First, the costs of index management will increase. The reason is that it will no longer be possible to use the same benchmark indices as those used by other managers. Internal trades (crossing) and the use of equity futures will no longer be as appropriate. This means that changes in equity exposure must to a greater extent be based on purchases of physical equities in the market, thereby increasing transactions costs. Second, environmental criteria will make it more difficult to achieve an excess return in active management. The reason is that such criteria will result in a considerable reduction in the Fund's investment universe, which in turn will limit the options available to active managers.

In this submission, we have shown that environmental guidelines that limit the Petroleum Fund's investment options may increase the Fund's risk at the same time that it will be more difficult to implement cost-effective management. Consequently, there are definite costs associated with the introduction of environmental guidelines for the Fund. These costs must be balanced against any environmental gains resulting from such guidelines. It is difficult, however, to document these environmental gains. Another question is whether there are other instruments that may be more effective for achieving the environmental objectives of the authorities.

The introduction of environmental guidelines for the Petroleum Fund may also be motivated either by the unwillingness of the Norwegian authorities to be associated with environmentally harmful activities or the desire to support companies that introduce positive environmental measures. This justification is not dependent on whether the measures have an impact on the environmental efforts of the companies. It is the political authorities that must evaluate the gains derived from such measures. It is important, however, that these gains are evaluated against the costs this will entail for the management of the Fund. An evaluation should also be made of whether it shall be taken into account that the state already has ownership interests in a large number of enterprises engaged in various types of business activities where it may also be argued (with equal force) that emphasis should be placed on environmental considerations.

An alternative to excluding companies from the Fund's investment universe is to use voting rights provided by equities to influence companies' work on environmental issues. A major advantage of this alternative is that it does not influence the management of the Fund. However, it is also necessary to be aware that the use of voting rights will require considerable work on elaborating precise guidelines that show how the Fund shall vote on various questions.

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