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Norway

Background

811. At the end of 2001, Norway's central bank, the Norges Bank (the Bank), managed funds worth NKr 795 billion (US$88 billion) in the international capital markets. The bulk of this capital was the Government Petroleum Fund (NKr 613 billion/ $68 billion), which is managed on behalf of the Ministry of Finance, and the Bank's international reserves (NKr 170 billion/$19 billion). Norges Bank's international reserves comprise the foreign exchange reserves, gold reserves, and claims on the IMF. In addition, the Bank manages the Government Petroleum Insurance Fund (NKr 11 billion/$1 billion) on behalf of the Ministry of Petroleum and Energy.[47]

812. The foreign exchange reserves (NKr 157 billion/$17 billion) are split into four sub-portfolios;

- the *liquidity portfolio* (NKr 37 billion/$4 billion), which is to be used in connection with the conduct of monetary policy (for potential foreign exchange interventions and to influence liquidity and interest rates in the Norwegian money market);
- the *long-term portfolio* or investment portfolio (NKr 106 billion/$12 billion), which should also be available for market operations, but should be invested on the basis of more long-term considerations;
- the *immunization portfolio* (NKr 6 billion/$1 billion), which is equivalent to government foreign currency debt and is intended to neutralize foreign exchange and interest rate risk associated with this debt; and
- the *Petroleum Fund buffer portfolio* (NKr 7 billion/$1 billion), which receives capital daily, and is transferred to the Government Petroleum Fund on a monthly basis.

813. The liquidity portfolio is managed by Norges Bank Monetary Policy (NBMP) by the Market Operations Department (MOD). All other funds/portfolios are managed by Norges Bank Investment Management (NBIM), which was established as a separate wing in January 1998 to meet the Bank's challenges of having been delegated the responsibility for managing the Petroleum Fund. NBIM's sole purpose is to function as investment manager and thereby take advantage of the benefits inherent in being a large institutional investor. Economies of scale made it natural to assign NBIM the responsibility for handling a large part of the foreign exchange reserves. To prevent duplication of internal resources, NBIM delivers settlement and IT services to NBMP/MOD.

[47]Guidelines and performance reports for the foreign exchange reserves and various funds managed by the Bank and invested in the international capital markets are presented on Norges Bank's website (www.norges-bank.no).

814. In addition to being responsible for the management of the liquidity portfolio, NBMP/MOD also carries out the purchases of foreign exchange to the buffer portfolio. This ensures that these responsibilities are viewed in conjunction with the department's activities in implementing monetary policy.

815. The way the Bank carries out the mission of managing the Petroleum Fund has also contributed to a more professional management of the foreign exchange reserves with more focus on performance, and has influenced the investment strategy of the long-term portfolio (as compared to the old strategy back in 1998, equities are now included, the number of markets is larger, and the duration of the fixed income portfolio is higher).

Developing a Sound Governance and Institutional Framework

Reserve management objectives and coordination

816. The objectives of reserves management are: (i) funding intervention, (ii) managing national wealth (high return), and (iii) immunization of government foreign currency debt.

817. In the monetary policy, a formal inflation target was adopted in March 2001. The interest rate is the main monetary policy instrument, but interventions may be considered in special circumstances. Measured in months of imports, Norway has quite large reserves. Both the size of the reserves and the change in the monetary policy imply that it is more appropriate with a longer investment horizon.

818. The Executive Board of the Norges Bank establishes guidelines for the management of the foreign exchange reserves. The aim of the management is to maximize the return within the constraints specified in the guidelines. From 2001 onwards, a part of the long-term portfolio (20 percent) has been invested in equities. The Executive Board has decided to further increase the equity share, and to include nongovernment securities in the bond portfolio.

819. The management of the foreign exchange reserves is coordinated with the Ministry of Finance's management of government foreign debt. The way this is carried out is that a small part of the reserves—the immunization portfolio—has been set aside to be equivalent to government foreign currency debt. In 2004, the existing government foreign debt (worth only NKr 6 billion at end-2001) will be settled in its entirety.

820. One may therefore conclude that objectives (i) and (iii) mentioned above have become less important over time and (ii) more important.

Institutional framework

821. Pursuant to the Norges Bank Act, Norges Bank shall invest the official foreign exchange reserves with a view to maintain the foreign exchange policy that has been established. The King in council may issue rules concerning the investment of the official foreign exchange reserves. In practice, however, Norges Bank's Executive Board has laid down guidelines for the investment of reserves.

Transparency and accountability

822. There is a clear division of responsibilities, which is reflected in the organizational setup and well documented in written guidelines, mandates, and job instructions. The overall responsibility for operations rests with the Executive Board, which sets the overall strategic guidelines (including major risk limits) and receives quarterly management reports.[48] The Board has delegated to the Governor to set supplementary guidelines. The Governor has in turn delegated further specifications to the responsible manager (wing leader).

823. Instrumental to the establishment of a clear distribution of roles and responsibility is the division between strategy formulation on the one hand and operational management with a clear responsibility for performance on the other. A separate unit within the Governor's staff has been given

[48]Until 2000 the Executive Board delegated to the Governor to define the benchmark portfolios and the limits for relative risk (tracking error), as well as credit risk (minimum rating level). These fundamental limits are now placed with the Board itself.

the responsibility for preparing advice on the strategic guidelines and benchmark portfolios of the reserves and the Petroleum Fund.[49] The leader of the respective wing has responsibility for the performance results of the portfolio(s) under management. This principle of decentralized management is an important characteristic of Norges Bank's general management model. This may contrast with various other central banks where investment management decisions may be based (more or less) on investment committees with members from different parts of the organization. Responsibility for internal control lies with the wing as part of the line-based management model.

824. NBIM is a separate management unit that does not have access to market-sensitive central bank information ("Chinese walls"). The manager reports directly to the Governor, like the other wing leaders. Within NBIM, there is a sharp line between the departments that make decisions regarding investment, and the Investment Support Department, which takes charge of transaction settlement, risk measurement, return measurement, and accounts. Responsibility for control rests with the front office departments. These constantly monitor the internal and external management. Independent control of market and credit risk is carried out in the Investment Support Department. The Legal and Compliance Department oversees the internal control functions, and is a primus motor in compliance work.

825. NBIM's most important objective is to achieve the highest possible return pursuant to applicable mandates and limits. It is easy for the delegating authorities and other observers to assess whether the performance targets are attained. Assignments are clearly defined in written mandates, and NBIM's results can be compared with defined benchmark portfolios. The establishment of NBIM as an independent unit in Norges Bank makes its responsibility for performance more transparent.

[49]For the reserves, the guidelines prepared by the Governor's staff are set by the Executive Board or the Governor. For the Petroleum Fund the guidelines are given by the Ministry of Finance, except supplementary guidelines for credit risk, which are set by the Governor.

826. In NBMP/MOD, risk control and return measurement are carried out in a separate unit independent of the front unit. The middle office unit reports to the head of MOD.

827. Outside NBMP/MOD and NBIM, the Governor of Norges Bank has a staff to supervise and monitor compliance and, as mentioned, to formulate strategy. Previously the Governor also had a special advisory committee from departments other than NBIM, NBMP/MOD, and the Governor's staff to assist the Governor in this work. Recognizing that the work of the advisory committee was overlapping with the work of the Governor's staff, the committee was removed in 2001.

828. External auditing is performed by Norges Bank's separate Audit Unit, the Central Bank Audit, which reports to the Bank's Supervisory Council, which is appointed by the Parliament. The Central Bank Audit is responsible for the operational auditing of investment management, as well as the statutory financial audit of the Bank's accounts. In its mandate the Central Bank Audit is also asked to do work that is ordinarily considered the responsibility of an internal auditor. The audit is carried out in accordance with recognized auditing standards in Norway, which are based on international auditing standards.

829. The Supervisory Council is responsible for ensuring that the rules for the Bank's activities are observed, including general monitoring and follow-up of the Executive Board. The Executive Board and the Supervisory Council receive a quarterly report on the management of the reserves consisting of detailed reports on each of the sub-portfolios and a concentrated report extracting the most relevant information in the sub-reports (see below). It may also be pointed out that the Governor receives a monthly report from NBIM on the performance of all NBIM portfolios. The Governor also has a special monthly follow-up meeting with NBIM, where performance and other topics relevant for the Governor in evaluating NBIM are addressed.

830. Detailed accounts of the foreign exchange reserves are presented in the Bank's annual report, including book value (i.e., market value) and return in Norwegian kroner (NKr) of the total reserves and the different sub-portfolios, as well as

the currency composition of the total foreign exchange reserves. The annual report also contains a separate chapter describing investment management in Norges Bank, including the percentage return attained on each of the sub-portfolios and compared with the benchmark return.

831. Since 2001 Norges Bank has, via the Internet, extended to the public information about the reserves.[50] The reason for the change in policy is that the Norwegian Government applies a principle of transparency to the Bank's management of the Petroleum Fund. The foreign exchange reserves may also be considered as part of public funds subject to openness. The new information includes guidelines for the investment of foreign reserves issued by the Executive Board, as well as supplementary guidelines set by the Governor. In addition, the quarterly concentrated management report mentioned above is presented on the web as of 2000/Q4. This report displays size and return of the different sub-portfolios (and relative return compared to the benchmark portfolio) as well as actual asset class and currency composition, and portfolio risk exposure compared with limits. Returns are measured both in the currency basket of the benchmark portfolio and in NKr. The more detailed management reports for each of the sub-portfolios in the reserves are not made public.

832. Norges Bank is aware that managing the Government Petroleum Fund and the foreign exchange reserves requires active use of salary and personnel policy incentives. The market for persons with experience in financial and investment management is characterized by a high salary level with an element of performance-related pay in combination with extraordinary demands for focused work. The Bank's success in achieving good management results will depend very strongly on its ability to recruit, develop, and retain highly qualified personnel from this market. The Bank is very conscious of developing the competence of its own employees.

[50]Most of the web pages are available in English.

833. Part of the salary of employees with responsibility for the results of investment decisions is based on performance. In 2001, this was the case for more than one third of the NBIM employees. This pay system has been extended to key personnel in investment support functions.

834. To a lesser degree, NBMP/MOD has implemented a payment structure where payment partly is based on performance (on a broad basis).

835. It is part of the IT strategy that top skills are bought where they are found, whether by own employees or outsourcing. All technical support and a large part of systems development and applications support are performed by external suppliers, both outside and inside Norges Bank's premises. NBIM has defined the type of core competence the unit would like to have. Other functions will be outsourced if possible.

Establishing a Capacity to Assess and Manage Risk

Benchmark portfolio

836. The level of risk derived from the investment strategy comes from two sources: the long-term strategy specified by the benchmark portfolio and the short-term strategy or the permissible deviations from the benchmark. By far the most important is the benchmark portfolio. The level of risk in the benchmark is determined by the currency distribution, asset classes (equities, bonds), type of securities, and duration of bonds. The benchmark for the liquidity portfolio reflects that the portfolio is to be used for interventions: high liquidity, short duration. The benchmark for the long-term portfolio reflects the intention of managing wealth (high return): bonds and equities, global diversification. Risk is also affected by the maximum allowable deviations from the benchmark. This is handled in the strategic guidelines by specifying limits for tracking error, asset class mix, currency and market distribution, duration, and minimum level of ratings, etc. See our website for the detailed benchmarks and limits.

837. The investment strategy for the long-term portfolio (which includes equities) is based on analysis of portfolio return and risk, using an in-

house simulation model. In the calculations estimates of expected portfolio return are based on historical data and, alternatively, on simplified subjective judgments. Risk is measured as the annualized standard deviation of the portfolio return, based on a covariance matrix of historical returns. In addition, the probability of having a negative portfolio return in any single year is calculated. The analysis showed that including a small part of equity exposure would enhance the portfolio return without significantly increasing the risk.

838. The asset weights of the benchmark portfolio float with the market prices, and rebalancing the benchmark weights means that managers will incur transaction costs in the actual portfolio. A specific risk analysis has therefore been performed to determine optimal rules for rebalancing the benchmark.

839. The liquidity portfolio is to be used in connection with the conduct of monetary policy. It is important that the portfolio is invested in liquid currencies. The euro is the most relevant currency for interventions and the U.S. dollar is the most relevant currency for operations in currency swaps to influence liquidity and interest rates in the Norwegian money market. Currency swaps are only a supplementary instrument in domestic liquidity operations. Because of diversification purposes the liquidity portfolio is also invested in sterling and Japanese yen. The distribution of the liquidity portfolio is as follows: 50 percent in euros, 25 percent in U.S. dollars, 20 percent in pounds sterling, and 5 percent in Japanese yen. The managing wealth motive of the long-term portfolio means more emphasis is placed on global diversification, with eight currencies in the fixed income benchmark and 12 currencies (22 markets) in the equity benchmark.

Instruments

840. The guidelines set by the Executive Board specify the allowable asset classes for each portfolio. Within the asset classes there is no list of allowable instruments, given that certain general requirements are fulfilled: Sound risk systems and control routines must exist for the instruments used in the management of the foreign exchange reserves. In addition, it must be ensured that there is sufficient expertise in all areas of activity.

841. Interest-bearing securities in the liquidity portfolio shall be issued by nation states, enterprises with government guarantees, or international organizations with a high credit rating. Investment is also permitted in bonds from other issuers related to the public sector, which may be included in the Lehman Global Aggregate Government Index. Permissible interest-bearing securities in the long-term portfolio are bonds that may be included in the Lehman Global Aggregate Index (investment grade), including corporate bonds, mortgage-backed, and asset-backed bonds. Bond issuers and counterparts in bank deposits etc. are subject to a minimum rating level. Equities in the long-term portfolio must be listed on a stock exchange in one of the countries listed by the Board.

842. Before trading in a new instrument commences, documentation must be available that identifies the various types of risk associated with use of the instrument, and that confirms that provision has been made for adequate expertise, risk systems, and control routines. Derivatives may be used to the extent that the ensuing financial exposure does not exceed the exposure that would have resulted from investing directly in the underlying instruments. Overall risk management is to be undertaken in which the exposure in derivatives is integrated with the exposure from underlying instruments.

843. In practice it will be up to the leader of the respective wing to specify a list of allowable instruments.

844. Both interest rate and equity derivatives have been used extensively to attain desired positions in a cost-effective manner. In the transition in 2001 from 0 to 20 percent equities within the long-term portfolio, equity index futures were applied before converting the equity exposure to physical shares. Interest rate derivatives include bond futures, LIBOR futures, options on futures, and interest rate swaps. Activity in derivatives must obey the rules mentioned above.

Risk and performance measurement

845. As mentioned, the objectives of holding reserves are multiple. Therefore the reserves are

divided into four different sub-portfolios, and separate guidelines are drawn for each portfolio.

846. Market risk is calculated as the expected annual standard deviation of the portfolio returns based on portfolio holdings and time series of historical market prices. Credit risk is primarily measured by the ratings from the leading rating agencies.

847. Interest rate risk is measured by modified duration. The liquidity portfolio has a short duration (about 1.5 years). The level of duration for the long-term portfolio (approximately 5.5 years) mirrors the duration of the market (indices), and reflects both the long-term investment horizon and the fact that in some bond markets empirical studies indicate that the maturity premium has been positive and rising for durations up to 2–3 years, with the rise in premium slowing thereafter and even stabilizing.

848. The reserve portfolios are, as mentioned, split between two different wing leaders, and the responsibility for managing risk in Norges Bank is with the wing leader. Therefore we do not quantify the expected return and risk for the total reserves. Instead, the Bank's return/risk objectives are reflected in the way reserves are divided into different sub-portfolios and the way the separate guidelines are designed.

849. The main strategic choices for both the liquidity and the long-term portfolio are defined by means of benchmark portfolios. These are constructed portfolios with a given country distribution and specific securities from the various sub-markets. A benchmark portfolio is used to manage and monitor risk exposure, and also serves as a point of reference for evaluating the actual return achieved on the reserves.

850. We use external benchmarks (Lehman Brothers for bonds, FTSE for equities). For ease of comparing portfolios the policy is to use the same index provider for the various portfolios unless we have good reason to deviate. Benchmarks for the liquidity portfolio and the long-term portfolio are defined by the Executive Board and are to some extent made more precise by the Governor. The wing leaders are measured against the "official" benchmark, but they are free, of course, to apply sub-benchmarks for their different sub-activities.

851. Possible criteria for choice of an index are ease of access, transparency, clarity of selection criteria, investibility, breadth of coverage, quality of data, availability of historical data, customer service/support, quality of analytics, and ability to customize.

852. The Executive Board has stipulated that management of the foreign exchange reserves shall be aimed at achieving the highest possible return within the limits set out in the guidelines. Far the most important factor influencing returns is the benchmark portfolio. There are two reasons for allowing deviations from the benchmark portfolio. One is cost-effective management (index-related). The other is active management.

853. An upper limit has been set for the actual portfolio's deviation from the benchmark. This limit is a measure of relative risk (tracking error). In practice, this means that the difference in returns on the actual portfolio and the benchmark will normally be small. The upper limit for expected tracking error is 0.5 percentage point for the liquidity portfolio and 1 percentage point for the long-term portfolio.[51]

854. In NBIM, internal fixed income management is divided into two main areas: indexing and other index-related management on the one hand, and active management on the other. Within these two areas, activities are further divided into various special functions.

855. The objective of index management is to efficiently purchase the benchmark, while taking advantage of special pricing situations to achieve some excess return (enhanced indexing). The earnings potential of lending fixed income instruments from the portfolio is utilized. Another important task is to correct undesirable deviations from the benchmark in the most efficient way possible.

856. One objective of active management is to take advantage of systematic price differences between bonds with almost identical properties in order to achieve an excess return. Another strategy

[51]In simplified terms, a tracking error of 1 percentage point means that the actual difference between the returns on the benchmark and the actual portfolio will be between –1 and +1 percentage points in 2 out of 3 years on average.

for achieving an excess return is to take positions that depend on future interest rate movements. An important objective of management is to ensure breadth in the active fixed income management positions so that the return will not be overly dependent on individual explanatory variables.

857. The equity portfolio of the long-term portfolio was established in 2001. The entire portfolio has until March 2002 been managed internally as an enhanced index portfolio, taking advantage of special pricing situations, as for example in relation to the significant changes in the FTSE-index that occurred in June 2001. As for fixed income the earnings potential of lending equities is utilized. In March 2002 part of the equity portfolio was converted to external equity mandates. See below for a discussion of external management.

858. The total level of active risk within the long-term portfolio has until now been quite modest, mostly within the interval 20–40 basis points as measured by expected tracking error. In practice the liquidity portfolio has tracked the benchmark portfolio very closely, around 10 basis points as measured by expected tracking error.

859. Returns on the actual portfolio and the benchmark portfolio are calculated according to the market value principle.[52] For the long-term portfolio multiple historical performance horizons are applied to measure the average excess return. Monthly data go back to the beginning of 1998 when NBIM was established. An information ratio is calculated for the long-term portfolio.[53]

860. Management costs for the sum of the three reserve portfolios managed by NBIM are presented in quarterly reports. The costs incurred by NBIM's management activities consist partly of fees to external managers and custodian institutions, and partly by Norges Bank's internal operating costs. Similar calculations of the costs of managing the liquidity portfolio have not been made. One of the reasons for this is that portfolio managers in NBMP/MOD perform other tasks in addition to investment management.

861. For the long-term portfolio the Governor has set a target (in basis points) for the yearly excess return above benchmark. When compared with the target, the actual excess return is adjusted for taxes and transaction costs that may have resulted from changes in investment strategy. In the management of the liquidity portfolio, a part of the narrow risk limit of 50 basis points is utilized. It is set a target (internally) for yearly excess return that reflects the use of tracking error.

862. In Norges Bank's accounts, foreign exchange reserve items are valued based on their "fair value," i.e., their market value in Norwegian kroner. The accounting profit/loss includes both unrealized and realized gains and losses (in NKr). This means changes in market prices of currencies, bonds, and equities will impact the Bank's profit/loss account and the Bank's own capital. Though NKr is the relevant currency in the accounts, the return on the long-term portfolio and the liquidity portfolio is measured both in NKr and by local currency (weighted by the benchmark portfolio's currency basket). The reason is that return measured in NKr is not relevant to an evaluation of developments in the international purchasing power of reserves, which is of particular interest for the long-term portfolio.

External managers

863. According to the guidelines, external managers may be used in the management of the long-term portfolio. Such managers must have adequate internal ethical guidelines for their own activity.

864. In NBIM there was internal fixed income management from the start, while equity management on behalf of the Petroleum Fund was outsourced to external managers. Subsequently, external managers have been assigned responsibility for portions of the fixed income management (both on behalf of the Petroleum Fund and the long-term portfolio), while internal equity management has been built up. Today NBIM manages equities internally on behalf of the Petroleum Fund and the long-term portfolio.

[52]The detailed methodology for calculating the returns on the various portfolios Norges Bank manages are described in the appendix of the Government Petroleum Fund quarterly report. The report is accessible on our website.

[53]We define "information ratio" as the average monthly excess return over time divided by the standard deviation. This figure is annualized.

865. At the end of June 2002 about 10 and 47 percent of the long-term portfolio's fixed income and equity portfolios, respectively, were managed externally. These are all active mandates, except for one enhanced index equity mandate. The reason for using external managers in the reserves is to contribute to the objective of maximizing returns (above benchmark). It is natural to take advantage of the experience Norges Bank has gained in selection and follow-up of external managers in the Petroleum Fund also in the management of the reserves. When selecting individual managers Norges Bank applies the same general standards for the managers in the reserves as for the Petroleum Fund.

866. Requests for applicants are posted on the Internet. Manager selection is based on a four-stage process: (1) screening of applicants by 10 criteria (based on questionnaire one), which results in a short list of candidates; (2) analysis and selection by four groups of criteria (based on questionnaire two and interviews) give a further reduction to the finalists; (3) optimization process to select the managers (by a manager combination tool); and (4) ongoing monitoring and control.

867. The external portfolios form an integral part of the risk management of the long-term portfolio, and are subject to the following principles of monitoring: (i) performance and risk positions are monitored daily; (ii) all transactions are monitored weekly; (iii) monthly analysis of risk profile, value statistics, and earnings expectations; (iv) monthly/quarterly transaction monitoring (trading, momentum, and liquidity risk); and (v) yearly due diligence.

Management information systems

868. An integrated risk measurement system is used to assess and monitor relative and absolute risk. Expected annualized tracking error is calculated weekly for the long-term portfolio and the liquidity portfolio, to keep risk exposure within the limits. The system is also used to measure absolute risk (standard deviation) of the actual portfolio and the benchmark portfolio, as well as the modified duration of the fixed income portfolio.

869. Important elements in the Norges Bank's use of management information systems are: (i) daily updated information on holdings and prices in both internal and external portfolios; (ii) daily measurement of performance relative to benchmark; and (iii) daily/weekly monitoring of risk. Information on all internal and external managed portfolios is updated daily in the central data warehouse.

Stress tests

870. Apart from the quantitative analysis performed when strategy is reviewed, we do not use formal ongoing stress tests for the potential impact of specific scenarios. If we judge that a change in market conditions may have a negative impact on the reserve portfolios, we are prepared to amend investment strategy to protect the reserves from potential losses.

Operational risks

871. The degree of operational risk will depend on the organizational structure chosen (as described above), the procedures and technical systems used, and the expertise in the organization. Norges Bank places emphasis on managing this type of risk by establishing sound internal control procedures, a sound organization of activities with clear authorizations and a clear distribution of responsibility, recruitment of specialists with practical and theoretical qualifications, satisfactory training of personnel, technical standby solutions, and a sound set of legal agreements.

872. Once a year each wing makes a special report to the Governor's staff on the quality of the internal control. The objective is to detect major risks that may potentially be an impediment to the wing in reaching its goals, and to ensure that management is focused on managing those risks. An example of a risk that is given attention is NBIM's follow-up of external suppliers of various services.

873. Examples of measures established to reduce operational risks are routines for preventing unauthorized transfers and securities transactions, guidelines for staff involved in investment management to restrict their personal affairs and potential conflicts of interest, and contingency plans (e.g., in case activities at the head office in

Oslo should be prevented, NBIM's management office in New York is prepared to step in and undertake simplified management services).

Efficient markets

874. The part of the reserves that is the first to be drawn upon in interventions—the liquidity portfolio—is invested only in the very liquid currencies/markets: euro, pound sterling, U.S. dollar, and Japanese yen. The 50 percent weight in euros in the benchmark portfolio is split equally between the liquid bond markets of Germany and France.

875. Liquidity is of less importance for the long-term portfolio, but even this portfolio should be available for interventions. Compared to the liquidity portfolio, the fixed income part of the long-term portfolio has a few additional, minor currencies, considered to have liquid bond markets.

876. The equity part of the long-term portfolio is invested in 22 markets, which are all classified as developed markets (i.e., they all meet some specified minimum standards related to settlement systems, legislative regulation, size, and liquidity). As for bonds, the liquidity of equity investments depends both on the possibility of selling large amounts in a short time, and the possibility of using repo markets. The opportunity for selling shares on short notice without impacting prices depends, inter alia, on the turnover in the secondary market. It is not easy to judge precisely the liquidity of equities vs. bonds. Normally a diversified bond portfolio will be more liquid than a diversified equity portfolio. A moderate proportion of reserves invested in equities spread among many markets would not, to any substantial degree, weaken the possibility of raising liquidity when needed.