

**FOR
AGENDA**

SM/10/306

December 1, 2010

To: Members of the Executive Board

From: The Secretary

Subject: **Asset Allocation Under a Broadened Investment Mandate—Preliminary Considerations**

Attached for consideration by the Executive Directors is a paper on asset allocation under a broadened investment mandate—preliminary considerations. Conclusions and issues for discussion appear on pages 27 and 28. This subject, together with a paper on implementing the Fund's expanded investment authority—overview and work program (SM/10/307, 12/1/10), will be brought to the agenda for discussion on **a date to be announced**.

The staff does not propose the publication of this paper due to market-sensitive content.

Questions may be referred to Mr. Krueger (ext. 36854) and Mr. Steinberg (ext. 36386) in FIN.

This document will shortly be posted on the extranet, a secure website for Executive Directors and member country authorities.

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INTERNATIONAL MONETARY FUND

**Asset Allocation Under a Broadened Investment Mandate—Preliminary
Considerations**

Prepared by the Finance Department

In consultation with other departments

Approved by Andrew Tweedie

November 30, 2010

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EXECUTIVE SUMMARY

Expanding the Fund's investment authority is a key element of its new income model.

The required modifications of the Articles are currently awaiting acceptance by the membership. Exercising the expanded investment authority also requires that the Executive Board adopt rules governing the broadened investment mandate.

Consistent with the work program outlined in *Implementing the Fund's Expanded Investment Authority—Overview and Work Program* (SM/10/307, 12/1/10), the paper discusses the investment principles and key objectives for the gold endowment. It reviews general considerations for the management of an endowment, and highlights the need to align investment policies with the endowment's specific objectives. For the Fund, the new income model envisaged that the endowment would provide a meaningful contribution to its administrative expenditures, while at the same time preserving the long-term real value of its resources.

In order to meet these two broad objectives, the paper concludes that a more diversified portfolio than the current Investment Account (IA) will be needed. The paper extends earlier analysis by examining a wider range of portfolios and covering a longer time period, including the recent crisis. Taking into account the historical experience as well as investment strategies of other relevant investors, including other international financial institutions, the paper concludes that diversified portfolios can help mitigate the risk of not preserving the long-term purchasing power of the proposed endowment while at the same time providing a rate of return sufficient to make a meaningful contribution to the Fund's long-term income needs as envisaged under the new income model reforms.

A range of potentially eligible asset classes is considered for investing the gold endowment. Maintaining a bond only portfolio runs the risk that the endowment would not achieve its broad financial objectives with a high degree of probability and it is proposed that consideration be given to expanding the set of eligible asset classes beyond those in the current IA into several areas, including mature market equities and bonds as well as emerging market instruments. Consideration of alternative asset classes is not proposed at this stage but the case for including such assets could be revisited at a later date once experience has been gained.

Further work is needed to define the key elements of the Fund's expanded investment policies. Based on Directors' views, staff plans to return to the Board with more specific proposals on the design and implementation of the endowment portfolio. Further work is needed also on a range of other issues, including on the governance structure, safeguards to address conflicts of interest, and the strategies for the Fund's other portfolios.

I. INTRODUCTION¹

1. **Expanding the Fund’s investment authority is a key element of its new income model and requires entry into force of the relevant proposed Amendment of the Articles.** Building on recommendations of the Committee of Eminent Persons, the Board of Governors approved in May 2008 an amendment of the Articles providing for an expansion of the Fund’s current investment authority (Box 1).² The proposed amendment is currently awaiting acceptance by the membership.³

2. **Once the amendment of the Articles has entered into force, the Executive Board will need to adopt new rules before the Fund can exercise its expanded investment authority.** As outlined in the accompanying chapeau paper (SM/10/307), in the lead-up to the approval of the new income model Directors held a series of discussions on issues related to this topic,⁴ beginning with consideration of the Eminent Persons’ recommendations in August 2007. Subsequent discussions covered, among others, possible investment objectives and risk issues (October 2007), the governance structure and potential conflicts of interest (April 2008), and proposed decisions related to the new income model (April 2008). In these discussions, a consensus emerged that the design of the new rules and regulations should be guided by three principles:⁵

¹ The paper was prepared by a FIN staff team led by G. Steinberg, and consisting of A. Attie, S. Marcelino, H. Poirson-Ward, R. Price, and P. Sribhoga. T. Krueger also contributed.

² *Report to the Managing Director by the Committee of Eminent Persons on the Sustainable Long-Term Financing of the Fund* (FO/DIS/07/08, Rev. 1, 1/31/07), referred to as the Committee report below; *Developing a New Income Model for the Fund—Decisions and Report of the Executive Board to the Board of Governors* (SM/08/80, Rev. 1, Sup. 1, 4/8/08). Resolution No. 63-3 of the Board of Governors approved an Amendment which would enable the Fund to invest resources held in the Investment Account as it may determine, in accordance with rules and regulations adopted by the Fund by a 70 percent majority of the total voting power.

³ The proposed Amendment will enter into force once three-fifths of the members, having 85 percent of the total voting power, have accepted it. As of end-November, 2010, 95 members (of the required 113) representing 84 percent of total voting power have accepted the Amendment.

⁴ See *Developing a New Income Model for the Fund* (SM/07/235, 7/2/07); *The Chairman’s Summing Up—Developing a New Income Model for the Fund* (BUFF/07/115, 8/3/07); *Developing a New Income Model for the Fund—Further Considerations* (SM/07/330, 9/19/07); *The Chairman’s Summing Up—Developing a New Income Model for the Fund—Further Considerations* (BUFF/07/142, 10/16/07); and *Developing a New Income Model for the Fund—Decisions and Report of the Executive Board to the Board of Governors* (SM/08/80, Rev. 1, Sup. 1, 4/8/08).

⁵ *Developing a New Income Model for the Fund—Decisions and Report of the Executive Board to the Board of Governors* (SM/08/80, Rev. 1, Sup. 1, 4/8/08).

- **governance arrangements:** the Executive Board would play a central role in both determining eligible investment policies and in monitoring their implementation;
- **investment principles:** the investment policies for the Fund's reserves currently held in the Investment Account (IA) and the Fund's new investment portfolio funded by gold sales would take into account a number of factors, including the Fund's mandate, investment objectives, income needs, and assessment of acceptable levels of different types of risk, particularly in light of the public nature of the funds to be invested and the investment practices of other public institutions; and
- **conflict of interest:** the rules and regulations will include safeguards to ensure that implementation of the expanded investment authority would not give rise to an actual or perceived conflict of interest. Previous Board papers have concluded that safeguards—such as the use of external managers or indexation, and limiting the role of the Board to establishing the broad direction of the Fund's investment strategy and the policies to guide that strategy—are expected to help manage satisfactorily the issues relating to potential conflicts of interest.

Box 1. The Current Investment Authority

The existing Articles of Agreement contain specific provisions on the Fund's investment authority, limiting the scope of eligible instruments. The current investment authority effectively limits investments to bonds issued by the governments of Fund members, international financial institutions, and certain national agencies. Within this authority, the Board has selected an asset allocation strategy focused on bonds issued by governments whose currencies are included in the SDR basket. The current benchmark of the Investment Account—the 1–3 year government bond index weighted to reflect the currency composition of the SDR basket—results in a portfolio of low-yielding assets with relatively low volatility and a concentrated exposure to three key risk factors: the slope of the yield curve, the level of credit spreads, and the direction of interest rates.¹

¹ *Establishment of the Investment Account* (EBS/06/57, 4/17/06). Also see *Establishment and Operation of the Investment Account* (SM/05/317, 8/15/05), and *The Acting Chair's Summing Up: Establishment and Operations of the Investment Account* (BUFF/05/147, 9/9/05). The Executive Board established the Investment Account and adopted Rules and Regulations for its administration on April 28, 2006 (Decision No. 13710-(06/40) IA and Decision 13711-(06/40), both adopted 4/28/06).

3. **This paper revisits the second of these principles.** It takes as a starting point the IMFC's request for further work on the design of investment policies under the Fund's expanded investment authority that would rely, to the extent possible, on a passive

investment approach that closely tracks widely used benchmark indices.⁶ In this regard, it seeks to expand earlier staff analysis by considering a broader range of portfolios and also extending the analysis to cover the recent crisis period and a longer historical perspective. This expanded analysis provides a firmer basis to assess the risk-return benefits of investing in a variety of asset classes beyond those covered by the current investment mandate. The paper also provides background on endowment investment management and revisits the 3 percent real return target assumed by the Committee and embedded in the Fund's medium-term income projections.

4. **Subsequent Board papers will cover other issues related to the implementation of the gold endowment.** Directors' views on the broad investment principles discussed in this paper will form the basis for future staff work, including on governance issues and portfolio policy.⁷ In particular, the adoption of a broadened investment mandate will raise new implementation issues relative to those arising under the more narrow mandate of the current IA.

5. **While the paper focuses on the gold endowment, further work is also needed on issues related to the Fund's other investment portfolios.** Directors earlier agreed that the investment policies and strategies for the Fund's portfolios, including its reserves, could differ depending on the type of resources invested.⁸ For example, an "endowment tranche" funded through gold profits would have the objective of generating investment returns to contribute to the Fund's income while preserving the long-term value of these resources. By contrast, a "reserve investment tranche," representing the Fund's reserves excluding gold profits, would likely have a stronger focus on liquidity and on minimizing the risk of short-term losses—considerations that feature prominently in the existing mandate for the IA. Similar considerations apply to the investment of Trust assets. Staff will revert to these issues in a later paper.

6. **The paper is organized as follows:** Section II reviews the principles of endowment management and relevant issues for the Fund's gold endowment. Section III provides an analysis of illustrative portfolios, covering different aspects of asset diversification and investment management. The analysis reviews both historical performance (over shorter and

⁶ *Communiqué of the International Monetary and Financial Committee of the Board of Governors of the International Monetary Fund*, 4/12/2008.

⁷ See *Implementing the Fund's Expanded Investment Authority—Overview and Work Program* (SM/10/307, 12/1/10).

⁸ See BUFF/07/142.

longer-term horizons) as well as current return prospects for different investment classes. Section IV concludes and presents some issues for discussion.

II. INVESTMENT IN A LONG-TERM INCOME GENERATING PORTFOLIO

A. Endowment Investment Management

General principles

7. **Endowments are entities that have been given assets to generate a return to support specific purposes.** Each endowment entity is likely to be different in terms of its needs and financial resources, which implies that each endowment must address investment policy according to its own set of particular circumstances. For the IMF, the creation of an endowment funded by limited gold sales is a key component of the new income model. The endowment's assets will be invested under the Fund's broadened investment authority, with the objective of generating income while preserving the long-term real value of these resources.⁹

8. **Endowments vary in their time horizon and spending policies.** Some endowments in the not-for-profit sector have spend-out policies, where the donor has specified a partial or complete depletion of the assets over a pre-determined time frame. More commonly, endowments are pledged to exist in perpetuity ("perpetual endowments"). This is the case for many educational endowments. The Fund's gold endowment is similar to a perpetual endowment, as it aims to maintain the real value of the invested resources over time.

9. **Endowments differ from other institutional funds such as central bank foreign reserve portfolios and pension funds:**

- ***Central bank reserves need to be accessible on short notice in often adverse market conditions, while perpetual endowments can typically take a longer-term perspective.*** Central bank reserves can be seen as a backstop in the event of exceptional adverse financial conditions, where considerations of liquidity and security of nominal capital are paramount. By contrast, endowments seek reliable streams of income over time and can, in principle, be more tolerant of short- and medium-term market volatility.
- ***Pension funds typically expect their capital to be consumed, while perpetual endowments expect to preserve their capital in perpetuity.*** Moreover, regulatory, actuarial,

⁹ *Developing a New Income Model for the Fund—Decisions and Report of the Executive Board to the Board of Governors* (SM/08/80, Rev. 1, Sup. 1, 4/8/08).

and accounting standards suggest that pension funds must to a greater extent take market fluctuations into account when determining investment policy. As liabilities are contractual, defined benefit pension schemes in many countries are subject to strict minimum funding requirements. If breached, including under mark-to-market accounting convention, sponsors are required to take restorative action.¹⁰ For endowments, liabilities are reflected in the cash demands on the portfolio, which are generally small relative to total assets. Therefore, short-term volatility of asset prices is a less serious concern. Most endowments thus maintain an equity bias to enhance return potential over the long run, while pursuing diversification into other assets to reduce overall risk exposure.

10. **For endowments, risk goes beyond volatility and might be best defined by the likelihood and extent to which an endowment's resources fail to meet its strategic financial objectives.**¹¹ Educational endowments and others in the not-for-profit sector generally seek to control this risk and preserve purchasing power through diversification and prudent investment management. Under the conventional approach, the focus on a strategic asset allocation (SAA) relegates market timing and security selection decisions to the background and emphasizes the selection of asset classes as the critically important decision. As discussed further below, the SAA approach provides a disciplined decision-making framework, but also has some shortcomings: (i) it measures risk along a single dimension (volatility), which may not be well-aligned with the payout objectives of an endowment; and (ii) portfolio decisions are heavily reliant on the historical risk-return parameters.

11. **Generating a sufficient flow of income is also a primary consideration for the Fund's gold endowment, given its one-off funding.** Unlike many educational endowments, the gold endowment will not benefit from ongoing inflows which generally allow these institutions to be less focused on assets' income-generation potential when setting their investment strategy. This in turn allows other endowments a greater focus on non-income generating assets such as hedge funds and private equity.

12. **Best practice suggests that the key investment objectives and strategy are set out in a formal Investment Policy Statement (IPS).** The IPS is a document which systematically specifies objectives, constraints, and governance mechanisms and is thus useful for clarifying responsibilities and establishing accountabilities.¹² The document serves

¹⁰ An example is the 2006 Pensions Protection Act in the U.S., which regulates U.S. pension funds.

¹¹ In Section III, using recognized quantitative techniques, staff have tested for a range of portfolios and strategies the likelihood of not preserving purchasing power and generating a pre-specified real rate of return.

¹² In practice, the IPS is a highly customized document tailored to the preferences and circumstances of each institution, and generally includes the following components: (1) scope and purpose, (2) governance,

(continued...)

as a strategic guide in the planning and implementation of an investment program. Perhaps most importantly, it serves as policy guide that can offer an objective course of action to be followed during periods of market disruption when emotional or instinctive responses might otherwise motivate less prudent actions.

From endowment policy to operational investment strategy

13. Different approaches are used to translate endowment policy into investment strategy. They encompass a wide spectrum of discretion that is afforded to investment managers, ranging from completely passive (indexing) approaches or ones with very limited discretion (such as under the present rules for the Fund's IA) to those that provide broad leeway to the managers, possibly subject to some return target.

14. Under the most common approach, asset allocation is the key investment decision. Returns, volatilities, and correlations of individual asset classes serve as inputs in a mean-variance optimization to produce an efficient SAA. The portfolio is efficient in that it is expected to deliver the highest returns at an acceptable predetermined level of risk or volatility. Risk management, through the use of ranges and tracking error, focuses mainly on controlling volatility on the asset side of the balance sheet, relative to the benchmark—a strategy that has advantages (including in terms of transparency and performance measurement) but also several drawbacks:

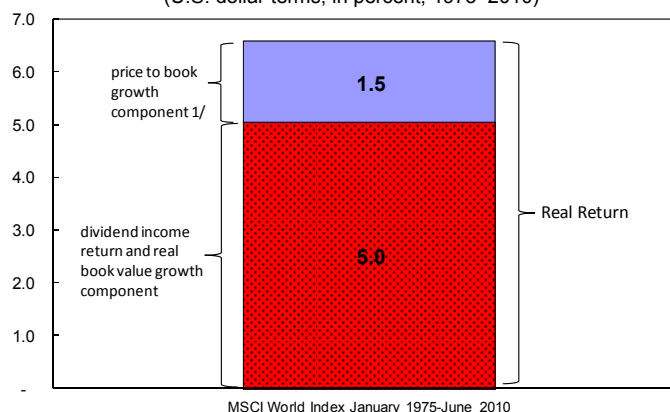
- Risk as defined by volatility may be controlled, but the risk of permanent impairment of spending power is not. A fixed income benchmark for example could include countries that may default, whilst equity benchmarks may include companies that become insolvent.
- The risks emanating from the benchmark to the endowment's liabilities (cash demands) are largely unaddressed. Even highly diversified portfolios may from time to time suffer periods when returns are negative, such as in 2008 in the wake of the global crisis. Under such circumstances the endowment may be unable to meet its liabilities, even if the actual portfolio is beating its policy benchmark. Many endowments and foundations in the educational and not-for-profit sector during the past 10 years have encountered this problem and suffered significant spending and budget cuts as a consequence.¹³

(3) investment, return, and risk objectives, and (4) risk management (see, for example, *Statement of Investment Policies, Standards, and Procedures*, New Zealand Superannuation Fund, June 2009; and *Investment Policy*, Alaska Permanent Fund Corporation, May 2010). For a further discussion, see *Elements of an Investment Policy Statement for Institutional Investors*, CFA Institute, May 2010.

¹³See 2009 NACUBO-Commonfund Study of Endowments.

- A more recent criticism suggests that the wide use of this technique, using similar models and assumptions, could contribute to investor herding and asset bubbles.¹⁴
15. **Against this background, and faced with generally poor results achieved during the past 10 years, pension funds and endowments are increasingly giving consideration to alternative approaches.** They cover a spectrum of methodologies, including:
- ***Liability driven investing.*** Pension funds in particular are beginning to move toward more “liability driven” investment strategies, forgoing possibly higher returns in order to “immunize” portfolios against the risk of assets and liabilities moving in opposite directions.
 - ***Allocating by risk.*** This strategy is being adopted by a small number of endowments and pension plans and involves safeguarding the portfolio against adverse economic outcomes through risk diversification, again possibly at the cost of forgoing higher returns. The illustrative diversified risk (DR) portfolio of Section III, with inflation-linked and conventional bonds as well as equities, is a stylized example of such an approach, serving as a hedge against inflation and deflation risks.
 - ***Real income strategy.*** This strategy seeks to exploit the historical feature that long-run returns are principally driven by *fundamentals*, i.e., income (stocks and bonds) and real earnings growth (stocks), rather than by other factors that may influence prices temporarily (see Figure 1 and Annex I), in order to

Figure 1. Annualized Real Return of the MSCI World Index
(U.S. dollar terms, in percent, 1975–2010)



MSCI World Index January 1975-June 2010

Sources: Datastream, IFS, and staff calculations

1/ Includes residual term accounting for the interactions between several components (see Annex I).

¹⁴ See for example John Authers, *The Fearful Rise of Markets: Global Bubbles, Synchronized Meltdowns, and How to Prevent Them in the Future*, FT Press, May 2010. Authers also argues that the widespread and growing use of passive investment techniques may create market inefficiencies and increase opportunities for active managers.

achieve stable, inflation-adjusted, income.¹⁵ The strategy focuses on securities that are able to pay coupons or dividends and ensure that they grow in real terms over time. For equities in particular, Annex I provides preliminary evidence that dividend-focused and other value-oriented approaches have over time shown superior risk-return characteristics relative to broad market indices.¹⁶

- **Dynamic asset allocation.** This encompasses a variety of approaches, all having in common that they depart from a purely static approach based on a fixed SAA. Under dynamic approaches, the asset allocation decision is made subordinate to the pursuit of an absolute rate of return and can be delegated to external managers, possibly within quite broad parameters. Typically, these products incorporate hedge fund strategies and/or derivatives, and such strategies may not be suitable at this stage for the Fund's endowment.

16. **Further work is needed to assess alternative investment strategies for the Fund's endowment.** The Board has previously noted that the evolution of the Fund's investment policies will need to proceed gradually and that, for the foreseeable future, these policies should rely, to the extent possible, on a passive investment approach that closely tracks widely used benchmark indices.¹⁷ Already, the current investment mandate for the Fund's IA allows external manager some discretion, albeit quite tightly circumscribed. Further work will need to carefully weigh advantages and disadvantages of different approaches for the gold endowment. This would need to take into account the lessons from the global crisis which, as discussed above, have pointed to important drawbacks of a rigidly passive investment approach and may argue for a modified approach.

B. Key Investment Considerations for the Fund's Gold Endowment

17. **In addition to the broad approach, consideration needs to be given to several specific issues in developing the investment strategy for the Fund's gold endowment.** These include the endowment's return objective and investment horizon, and the potential range of eligible asset classes to be considered. It is expected that strategies and policies on

¹⁵ Historically, prior to 1970, income provided the basis for determining an endowment's investment and spending policies. However, in following such policies, endowments focused on nominal income, skewing investment portfolios toward high-yielding fixed-income instruments at the expense of equities.

¹⁶ The superior performance of such strategies over a full market cycle reflects in part their higher returns during bear markets relative to market indices (see Annex I).

¹⁷ See *Developing a New Income Model for the Fund—Decisions and Report of the Executive Board to the Board of Governors* (SM/08/80, Rev. 1, Sup. 1, 4/8/08).

these issues will evolve over time, adapting as experience is gained, and also taking account of evolving best practices in endowment management.

Real return objective and investment horizon

18. **The purpose of the gold endowment is to diversify sources of income for the Fund, better aligning them with the multiplicity of the Fund's functions.** Specifically, as recommended by the Committee of Eminent Persons and subsequently reflected in the report to the Board of Governors on the proposed amendment to expand the investment authority of the Fund, the financial objective of the Fund's gold endowment portfolio will be to generate a sustainable and relatively predictable cash flow to support especially the public goods aspects of the Fund's mission while preserving the purchasing power of the new portfolio's resources.

19. **The Committee envisaged a real investment return of 3 percent, an assumption also underlying the new income model.** While the Board has not explicitly endorsed an overall return objective, its decisions on the new income model were based on income scenarios that assumed a 3 percent pay-out ratio. Subsequent updates of the medium-term income outlook have maintained this assumption as the central scenario. Supplement 1 presents updated estimates of the Fund's steady state income outlook. While these estimates are subject to a high degree of uncertainty, they suggest that the steady state income outlook—beyond the current income spike associated with higher lending—has not changed significantly. Thus, a real return target on the order of 3 percent over the longer-term may still be broadly appropriate.¹⁸

20. **This said, achieving a real return of around 3 percent could be challenging in the near term.** The historical analysis presented in the next section suggests that such a target should be attainable over time with a reasonably high probability for diversified portfolios invested in a range of highly-rated and widely traded asset classes. However, extended periods of relatively low investment returns have been experienced in the past and, as discussed in Section III.C, expected returns are currently low by historical standards in most mature and emerging markets.

21. **The potential risks of lower than expected returns could be contained by adopting an initially more conservative payout regime.** An initially conservative payout ratio would allow the Fund to first build up a track record of returns, and reduce risks that the capital base of the endowment would be eroded in the initial years. In addition, a gradual

¹⁸ By way of illustration, a pay-out ratio based on a 3 percent target could potentially cover roughly 20 percent of the Fund's administrative budget. This would fall to 7–15 percent for pay-out ratios based on a 1–2 percent real return target.

phasing of investments into the endowment could be appropriate to reduce market-timing risks. As discussed in SM/10/307 (12/1/10), staff plan to come back to these and other implementation-related issues in a subsequent paper.

22. It is also important to note that the case for adopting a diversified investment strategy for the endowment does not rest only on the particular return target chosen.

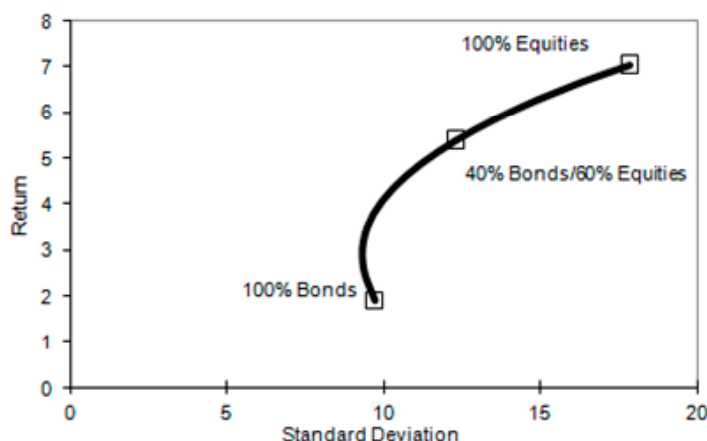
Any strategy that offers reasonable assurance of making a meaningful and sustainable contribution to the Fund's income within reasonable risk boundaries will require some combination of high-quality fixed-income assets (potentially including both conventional and inflation-protected bonds) that help preserve purchasing power and protect against deflation risks, and "growth" assets such as equities, which enhance real returns over time and provide added inflation protection, albeit with higher volatility.

23. The specific characteristics of the gold endowment also suggest a longer-term return horizon for assessing its performance. The Fund's reserves are currently held in the IA, for which minimizing the frequency and extent of negative returns and underperformance over a 12-month investment horizon are central objectives. Instead, the gold endowment's time horizon would be similar to perpetual endowments, given its objective of maintaining purchasing power in perpetuity. Such endowments typically assess their strategies over multi-year horizons of at least 3–5 years—and a similar long-run horizon would seem appropriate for the Fund's endowment. At the same time, the endowment would be subject to operational performance monitoring on an ongoing basis, similar to current practice for the IA.

Asset diversification

24. In the past, diversification has played a central risk-return management role in the investment strategy of endowments. The long-run evidence supports the view that diversification tends to help control volatility while lifting returns, and it mitigates against long-term impairment of purchasing power through inflation. When asset returns are less than perfectly correlated, diversification can improve the risk-return profile of the portfolio (see Figure 2 and Section III).

Figure 2. Risk and Return Trade-off for Developed Market Equities and Bonds 1/
(Real terms in percent, 1926–2009)



Sources: Ibbotson associates and staff calculations.

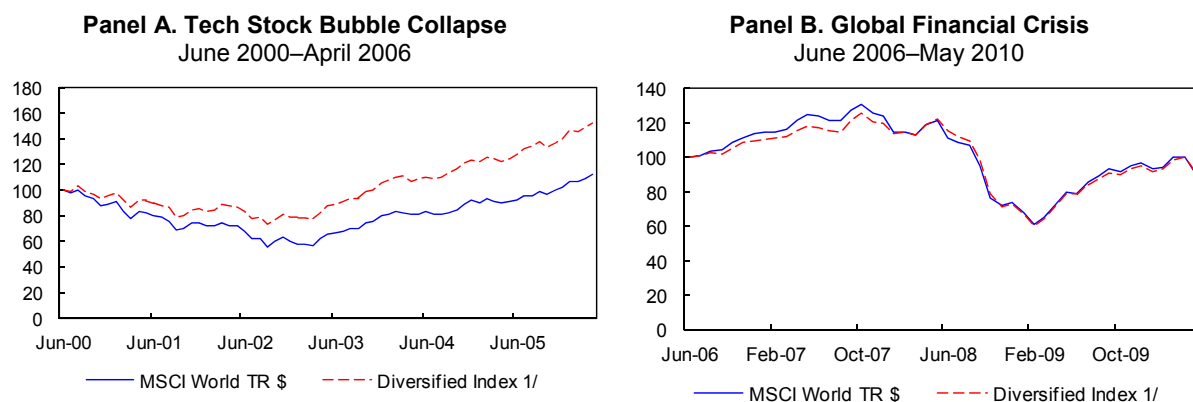
1/Returns computed based on allocation of 44 percent for the US market, 17 percent for Germany and France, 11 percent for Japan and the UK.

25. **The recent crisis has challenged some tenets of portfolio diversification, as correlations among many asset classes rose sharply.** In past market downturns, a diversified exposure to risk assets (e.g., equity, emerging market debt, property, and hedge funds) tended to provide equity-like returns but with lower volatility. For example, during the bursting of the tech bubble of 2000–02 and in the subsequent recovery, diversification provided significant benefits (Figure 3, Panel A). However, a similar diversification into a broad range of assets failed to provide the same protection during the recent downturn (Figure 3, Panel B).

26. **Nevertheless, most institutional investors and several international financial institutions (IFIs) continue to follow broadly diversified investment strategies** (Table 1). Many pension funds as well as the endowments of U.S. universities invest less than half of their assets in fixed income instruments. Equities typically account for a larger proportion of asset allocations, and alternative investment instruments also play an important role in many endowments as well as the Fund's SRP. Among IFIs, the World Bank's long-term income portfolio resembles in several respects the role envisaged for the Fund's gold endowment, and it has a 60/40 target ratio for equities versus fixed income instruments.¹⁹

¹⁹ See Annex II for further details on the World Bank's investment strategy.

Figure 3. Diversification during Recent Bear Markets
(U.S. dollar terms, June 2000–May 2010)



Sources: Datastream and staff calculations.

1/ Diversified Index (U.S. dollar terms): 50 percent MSCI World Equities Total Return index, 6 percent MSCI Emerging Markets Total Return, 9 percent Real Estate NAREIT Index, 12 percent GSCI Commodity Index, 13 percent HFRI Hedge Fund Index, 5 percent JP Morgan Emerging Market bonds EMBI+ Index, 6 percent Red Rock Private Equity Index.

Table 1. Asset Allocation: Pension Funds vs. Endowments
(in percent, as of December 31, 2009 unless otherwise noted)

	Europe ex- U.K. Pension Funds	U.K. Pension Funds	US Corporate Pension Funds	IMF Staff Retirement Plan (SRP)	U.S. Educational Endowments	World Bank Long-Term Investment Portfolio (Target)
Equity	43	50	51	51	32	60
Fixed Income	49	41	38	18	13	40
Alternative Investments	4	2	9	30	51	—
Absolute Return	—	—	n/a	13	22	—
Private Equity	—	—	n/a	10	17	—
Real Estate and Commodities	4	2	n/a	7	12	—
Other	4	7	2	2	4	—

Sources: 2009 NACUBO-Commonfund Study of Endowments, IMF, Watson Wyatt, Mercer, World Bank.

Notes: "n/a" indicates not available, and "—" indicates none. Asset allocations are actual unless otherwise noted. Other includes cash and short-term securities. Europe Pension Funds survey results are for 1,000 plans from 11 countries (Ireland, UK, Belgium, Sweden, Switzerland, Spain, Portugal, Netherlands, France, Norway, Germany) as of January, 2010. U.S. Corporate Pension Funds survey results are for 85 U.S.-based companies as of August 15, 2009. U.S. Endowments are dollar-weighted allocations for 842 endowments as of end-June 2009. For the IMF SRP, Fixed Income includes a real estate high income account and a multi-strategy high income account and Real Estate and Commodities include inflation-protected securities.

27. **For the Fund's gold endowment, risk mitigation and return objectives would also argue for a diversified investment mandate.** As discussed below, diversification beyond the Fund's current investment authority is likely to be required to preserve the purchasing power of the resources, while generating long-run returns sufficient to provide a meaningful source of diversified income.

28. **A range of potential eligible asset classes can be considered.** The selection of eligible asset classes requires a careful weighing of the benefits—such as return pick up and risk mitigation—as well as the potential costs, including reputational risks and perceived or actual conflict of interest issues. The Board already considered the latter issue in general terms prior to the approval of the new income model, and an external review noted that adequate safeguards were generally in place but that conflict mitigation policies could be needed in some cases (Annex III).²⁰ Staff will come back to these issues in the context of more specific proposals. At this stage, and assuming the conflict of interest issues will be adequately addressed, there would seem to be a strong case to consider expanding the endowment’s set of eligible asset classes into several areas:

- **Mature market equities:** publicly traded equities have offered over long time periods a substantial total return pick-up over the IA portfolio (i.e., government bonds of the SDR-basket currencies), with risk characteristics that most endowments (as well as the World Bank and some other IFIs) consider manageable. Diversification into equities could also help align the endowment’s objective of rising nominal payouts over time with its income stream.
- **Mature market bonds:** high quality non-government bonds have also tended to offer higher returns than the IA portfolio over time and, like equities, are typically part of endowment portfolios. The World Bank’s long-term investment portfolio targets a considerable allocation to U.S. federal-agency mortgage backed securities, and high quality bonds are among the eligible asset classes in some of its other portfolios (see Annex II).
- **Emerging market equities:** publicly traded emerging market equities account for about one quarter of world stock market capitalization and could provide an important risk diversification opportunity. Historical evidence suggests that they can also add to portfolio returns, albeit typically at higher volatility (see Figure 5 below and the discussion in Section III) and with a higher liquidity risks compared with mature markets.
- **Emerging market bonds:** high-quality foreign currency bonds issued by emerging market sovereigns or sovereign entities have historically exhibited substantially higher returns but also higher volatility compared with high-quality mature market bonds.

²⁰ See *Developing a New Income Model for the Fund—Additional Considerations—Supplementary Material* (SM/08/48, Sup. 1, 2/8/08). The external review, conducted by the international law firm of Wilmer Hale, identified some alternative investments as well as securities of members to whom the Fund is providing or likely to provide financial assistance as areas that could warrant special risk mitigating measures. They suggested using external managers, whose investments encompass a broad range of investments based on widely used benchmark indices, engaging a “manager of managers,” or adopting a passive investment approach around publicly available benchmark indices as three options that could address some of these risks.

Consideration could also be given to investing in local currency bonds issued either by sovereigns, which are already eligible investments under the current Articles of Agreement,²¹ or by highly-rated corporates. These bond markets have developed in recent years, but their still relatively small size (compared with mature debt markets) could raise additional governance issues. Depending on Directors' views on the scope for investing in these asset classes, future work would revisit the relevant governance issues, including how to handle the case of actual or potential Fund lending—issues that can arise in mature as well as emerging markets.

29. **Alternative asset classes are widely used by endowment-like portfolios but may not be appropriate for the Fund at this stage.** Some of these assets, including private equity, real estate, commodities, and hedge funds, have over time offered additional return opportunities and diversification benefits relative to a portfolio invested predominantly in bonds and equities. However, a new investor (like the gold endowment) would face considerable challenges in accessing these markets, including the need to undertake due diligence assessment of the investment opportunities and of acquiring the necessary investment skills. Some such investments also entail significant upfront costs that tend to be recouped only over time. On balance, staff does not propose further consideration of such asset classes at this stage, but the case for their possible inclusion could be revisited in the future, as more experience is gained with managing the endowment portfolio.

III. EVALUATING ILLUSTRATIVE PORTFOLIOS

30. **This section presents a number of stylized portfolios to illustrate some of the broad investment strategies discussed in Section II.** The portfolios include a variety of asset classes, including government and corporate bonds, emerging market debt, mature and developing market equities, asset-backed securities, and alternative assets (real estate, commodities, hedge funds, and private equity). As discussed above, not all of these assets may be suitable investments for the Fund's gold endowment, and the purpose of the analysis is to capture the trade-offs involved in different strategies and seek Executive Board guidance for future work. As always, care needs to be taken in inferring lessons for the future from historical performance.

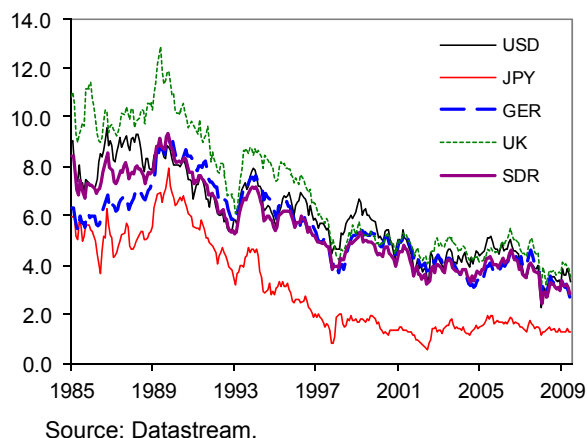
31. **Portfolio performance is reviewed over different historical periods.** The central analysis focuses on portfolio performance over the period 1987–2010, for which comprehensive data are available. However, one key shortcoming with this analysis is that,

²¹ While local currency bonds are eligible for investment in the IA under the Articles, current investment guidelines approved by the Board preclude such investments as the bonds are not denominated in currencies in the SDR basket.

while the period covers several equity market cycles, it was characterized by a secular decline in mature bond market yields that is unlikely to be repeated in the future (Figure 4).

This boosted the performance of fixed income assets to levels that are exceptional by historical standards. In light of this shortcoming, a longer time period is also considered below, covering 1926–2009, although data constraints limit this analysis to a smaller set of portfolios. Finally, the section also discusses the current market environment and indicators of prospective returns, which are generally low in historical terms.

Figure 4. 10-Year Government Bond Yields (January 1986–May 2010, in percent)



Source: Datastream.

A. Composition of the Illustrative Portfolios

32. **Stylized portfolios have been constructed to illustrate the potential implications of alternative investment strategies, including different dimensions of asset diversification.** Three of the portfolios considered here (the two bond and the endowment-pension portfolios) are similar to those presented in earlier staff papers. Three new portfolios aim to capture broader diversification across instruments and markets as well as across different risk categories. Key features of these portfolios are the following (Table 2):

- **IA:** in line with the current IA, this portfolio includes 1–3 year government bonds, weighted by the SDR basket. Nominal capital preservation (avoidance of absolute losses) is the primary objective.
- **Fixed income (FI):** extended global investment grade bond portfolio. Some yield pick-up over the IA while still limiting risks of capital losses are the main considerations.
- **Broadly diversified mature markets (B1):** a diversified bond-equity portfolio, covering major mature markets. Long-term growth and risk containment are key objectives.
- **Broadly diversified mature/emerging markets (B2):** a broadly diversified bond-equity portfolio that, in addition to B1, includes emerging market equities and bonds. Higher growth potential and broader risk diversification (relative to B1) are important objectives.
- **Endowment-pension (EP):** a global, widely diversified portfolio, including alternative asset classes. Allocation is typical of return-seeking long-term institutional investors, including some universities and pension funds.

- **Diversified inflation-income risk (DR):** a portfolio that illustrates an “asset allocation by risk” approach. Inflation-linked bonds and bonds hedge against inflation and deflation risks, respectively, while equity protects against income risks.

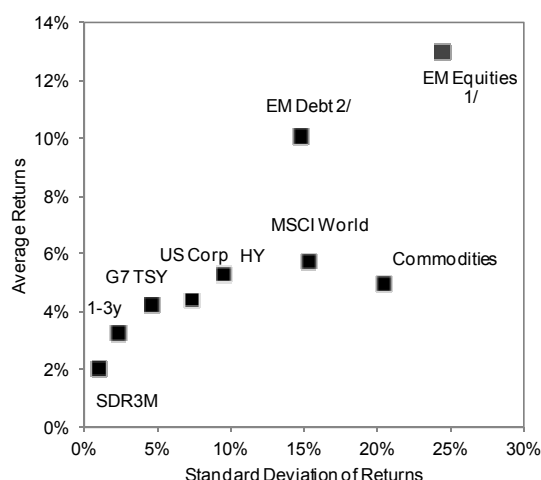
Table 2. Composition of the Illustrative Portfolios

Portfolio Name	Asset Allocation	Institutional Investor Use
IA Short-term government bonds	1–3 year government bonds weighted according to the SDR basket.	Similar to the current benchmark used for the IA, <i>included as a baseline</i> . Emphasizes liquidity and preservation of nominal capital as its primary objectives. Used by many central banks in managing official reserves.
FI Global bond portfolio	Investment grade bond portfolio of developed markets	Securities included in this portfolio are considered eligible investments by the World Bank and a number of central banks and other official institutions.
B1 Broadly diversified bond/equity (major markets)	60 percent mature market equities, 40 percent mature market investment-grade bonds.	Broadly reflects the proportion of equities held by some institutional investors with a long-term horizon. Aims at a mix of long-term growth (provided through the equity allocation) and risk-reduction benefits (provided through the bond allocation). Represents the core asset allocation of many long-term institutional investors, such as pension funds. Similar to the asset allocation recently adopted by the IBRD for its LTIP.
B2 Broadly diversified bond/equity (including emerging markets)	As above, with emerging markets (EM) at market value weights of 12 percent of equities and 10 percent of bonds.	The inclusion of emerging market equities and bonds raises the long-term growth potential of the portfolio. Many large institutional investor portfolios now include emerging markets, particularly equities, in their core asset allocations.
EP Endowment-pension	Mature market (MM) equities at 43 percent, mature market bonds at 14.5 percent, EM equities at 12 percent of MM equities, EM bonds at 4 percent, and alternatives at one-third of the portfolio.	A more fully diversified “endowment-pension” portfolio that includes, in addition to stocks and bonds, an allocation to so-called alternative investments (real estate, commodities, private equity, and absolute return). This allocation, used by long-term, return-seeking investors, is similar to that of U.S.-based endowment funds with assets of over US\$1 billion and several pension funds, including the World Bank’s pension and the IMF’s SRP.
DR Diversified Risk	One-third each of government bonds, inflation-linked bonds, and mature market equities.	Used to illustrate an “asset allocation by risk” approach (Section II). The three segments seek, respectively, to provide high total returns (equities), a hedge against deflation (nominal government bonds), and a hedge against inflation (inflation-linked bonds). (Data availability limits the analysis to a shorter period, 1997–2010).

B. Risk-Return Profile of Illustrative Portfolios

33. **Historical portfolio performance broadly supports the expectation of a risk-return trade-off.** This result is consistent with other empirical studies and the risk-return trade-off that underlies modern financial and portfolio theory. Riskier assets, as measured by their volatility, tend to provide higher returns (Figure 5). This is also the case at the portfolio level, where the endowment-pension (EP) allocation recorded the highest real rate of return but also the highest volatility (Figure 6).

Figure 5. Risk-Return Profile of Selected Asset Classes
(Real returns in SDR, 1987–May 2010)



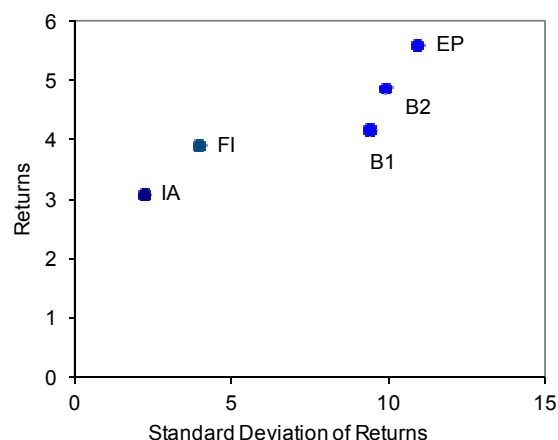
Sources: Datastream and staff calculations.

Notes: Returns and standard deviations are shown for the three-month SDR interest rate (SDR3M), the SDR-weighted 1–3 year government bond index (1–3y), G7 government bonds (G7 TSY), US Corporate bonds (US Corp), High Yield Bonds (HY), emerging market bonds (EM Debt) and equities (EM Equities), and commodities, using broad market indices.

1/Since 1988

2/Since 1992

Figure 6. Risk-Return Profile of Investment Portfolios
(Real returns in SDR, 1987–May 2010, in percent)



Sources: Datastream and staff calculations.

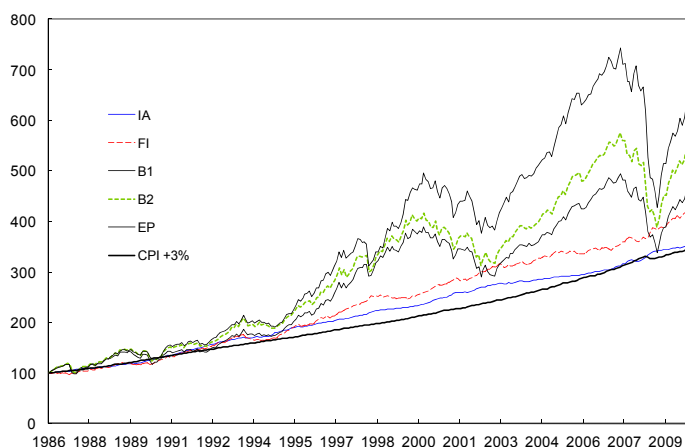
Notes: DR allocation not shown due to data availability limited to 1997–2010; see Table 2 for description of portfolios.

Performance since 1987

34. **All illustrative portfolios recorded real rates of return in excess of 3 percent during 1987–2009, as bonds benefited from exceptional market conditions.** The strong bond performance over this period benefited from a structural downward trend in inflation and inflationary expectations. This followed four decades of only marginal returns on mature market government bonds. Even during this more recent period, illustrative

portfolios that included equities and alternative assets recorded higher returns than the two bond portfolios (IA and FI; Figure 7 and Table 3). While the return pick-up in the case of the mature market equity-bond portfolio (B1) over the FI portfolio was small during this period, significantly higher returns were achieved in the illustrative portfolios that added emerging market and other asset classes (B2 and EP).

Figure 7. Cumulative Return of Illustrative Portfolios (1987–2010, in basis points)



Sources: Datastream, staff calculations.

Note: See Table 2 for description of portfolios.

Table 3. Illustrative Portfolios Summary Statistics (Real Returns in percent, 1987–2010)

	Return	St. Dev.
IA	3.1	2.1
FI	3.9	3.9
B1	4.2	9.3
B2	4.9	9.8
EP	5.6	10.9
DR 1/	3.6	5.7

1/ Since 1997

35. **Over one-year holding periods, the fixed income portfolios were less likely to experience nominal losses but fell short more frequently vis-à-vis a real return target** (Figure 8, Panel A). Performance of the current IA benchmark allocation was consistent with its focus on capital preservation and avoided losses in any one 12-month period. However, the IA portfolio underperformed nearly half of the time the 3 percent real return assumed by the Committee. Extending the investment mandate to include investment-grade fixed income securities (FI) increased the risk of negative returns but reduced the risk of underperformance against the real return target. The 60/40 portfolio (B1), the portfolio with emerging market securities (B2), and the endowment-pension (EP) portfolio, in contrast, faced a much higher risk of negative return in a 12-month period, but met the 3 percent real return threshold about 60 percent of the time.

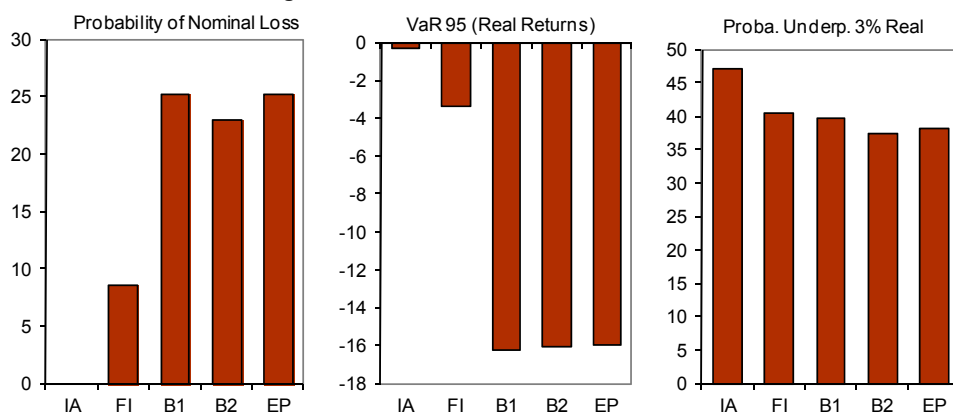
36. **Once longer holding periods are considered, asset diversification tends to increase the likelihood of meeting a real return target without significantly increasing risks of capital losses** (Figure 8, Panels B and C). Longer horizons take advantage of the higher-than-average returns during recovery periods. Over a five-year return horizon, for

example, the likelihood of nominal losses for each diversified portfolio fell below 4 percent and the 95 percent VaR was about -2 percent or higher in real terms during 1987–2010.²² Over a ten-year return horizon, all of the diversified portfolios (including the FI) had a substantially lower probability of underperforming a 3 percent real return target compared to the current IA asset allocation, and all but the 60/40 portfolio (B1) also had positive 95 percent VaR in real terms.

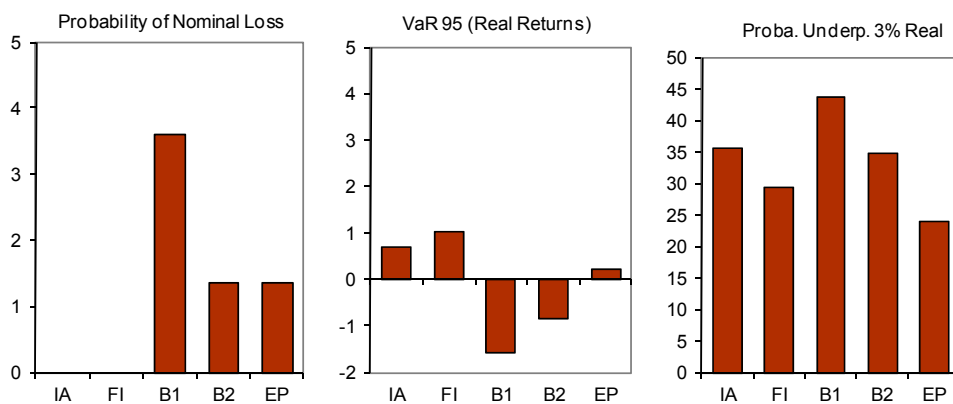
²² The VaR figures indicate the annual percentage decline in each illustrative portfolio that was not exceeded in 95 percent of the respective holding periods. At the one-year horizon for example, the IA and FI portfolios faced a real decline of at least 0.4 percent and 3.7 percent, respectively, in 5 percent of one-year holding periods (see Figure 8).

Figure 8. Illustrative Portfolios—Risk Metrics
(SDR terms, 1987–2010, in percent)

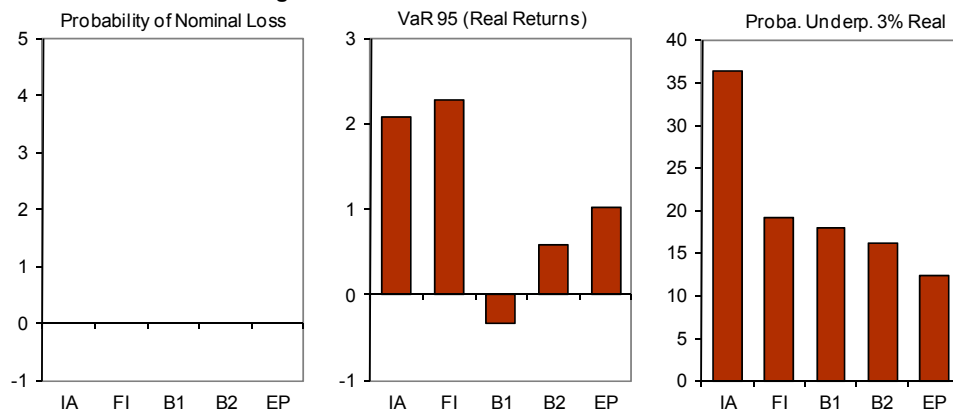
Panel A. One-Year Holding Period



Panel B. Five-Year Holding Period



Panel C. Ten-Year Holding Period



Sources: Datastream, staff calculations.

Long-Run Analysis: 1926–2009

37. **Long-run results, covering the period since 1926, confirm that equities have tended to increase portfolio returns—albeit at the cost of higher volatility.** Due to data limitations, the long-run analysis is restricted to short-term government bills, and long-term government bonds issued by public entities in France, Germany, Japan, the U.K., and the U.S. As shown in Table 4 below, longer duration government securities as well as equities recorded historically higher returns, accompanied by higher volatility. Real returns on equities were about 7 percent, while returns on government bonds, and even more so on short-duration treasury bills, fell short of 2 percent in real terms (see also Attachment III).

Table 4. Long Term Asset Class Real Return Performance: 1926–2009

	(In percent)									1926–2009	
	Annualized Real Return by Decade									Return	Sharpe Ratio
	1926–1929	1930's	1940's	1950's	1960's	1970's	1980's	1990's	2000's		
Mix Developed World 1/											
T-Bill	4.3	2.3	-10.8	0.2	1.1	-1.2	3.7	2.9	0.8	0.0	5.7
Govt Bonds	7.9	6.2	-9.1	-0.5	0.7	-1.6	7.2	7.0	4.1	1.9	9.8
Equities	18.8	3.8	2.1	19.9	5.1	0.3	13.8	11.6	-2.8	7.0	18.0
B1 2/	14.8	5.3	-2.3	11.9	3.5	-0.2	11.3	10.0	0.9	5.4	12.4

Sources: Ibbotson data (US markets), Barclays Capital (UK markets, US market since 2008), Global Financial Data (Japan, France, Germany), Bloomberg, and staff calculation.

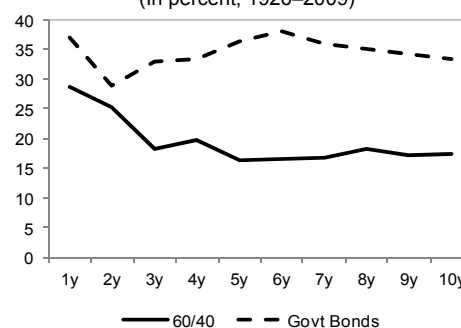
Note: Returns are in local currencies and are deflated by the consumer price index of relevant country.

1/ Asset class and portfolio returns computed based on an allocation of 44 percent for the US market, 17 percent for Germany and France, 11 percent for Japan and the UK.

2/ B1 performance is proxied by returns on an allocation of 60 percent equities (S&P500, U.K. equities) and 40 percent long-duration U.S. government bonds (U.K. gilts).

38. **The inclusion of equities also helped mitigate the risk of falling short of a positive real return target.** Though government bonds had periods of good performance (notably since 1985), long-run returns suggest that fixed income portfolios are less likely to meet a positive real return target than a portfolio that includes a significant equity component. In particular, government bond portfolios recorded prolonged periods of real losses (during the 1940s and the 1970s in most markets, and the 1940s through the 1970s in the U.S.). Equities recorded occasional negative real returns at short horizons, but the risk of negative returns declined considerably as the investment horizon was lengthened (Figure 9), though equities have performed

Figure 9. Frequency of Negative Returns over Different Time Horizons (In percent, 1926–2009)



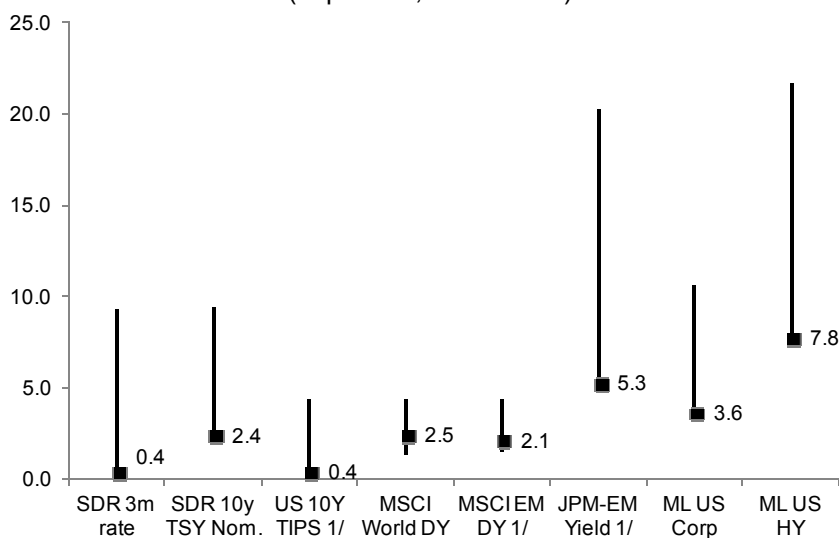
Sources: Ibbotson data (US markets), Barclays Capital (UK markets, US market since 2008), Global Financial Data (Japan, France, Germany), Bloomberg, and staff calculation.

poorly in the most recent decade. The inclusion of equities also improved overall portfolio efficiency, as measured by the higher Sharpe ratio²³ relative to a government bond-only allocation.

C. Prospective Returns in the Current Market Environment

39. **Current market indicators suggest that prospective returns from a wide range of asset classes may be lower than those achieved over the past 25 years.** Yields for a wide range of asset classes are currently very compressed relative to historical ranges. Figure 10 plots the current yield of different asset classes, together with the yield range of the asset since 1986. Historically low yields are evident for most asset classes, including sovereign fixed income, inflation protected securities, equities, and corporate bonds. In particular:

Figure 10. Current Yields (Mark) Compared with Historical High-Low Levels (Bars)
(In percent, 1986–2010)



Sources: Datastream, Bloomberg, Merrill Lynch, JP Morgan, staff calculations, as of end-May 2010.

Notes: Yield levels are for the three-month SDR interest rate, SDR-weighted 10-year nominal treasury bonds, 10-year U.S. inflation-linked bonds (a real yield), the dividend yield of the MSCI World Developed Market and Emerging Market indices (respectively), the JPMorgan Emerging Market bond index, and the Merrill-Lynch U.S. Corporate Bond and High Yield indices.

1/ Since 1997.

²³ The Sharpe ratio measures the excess return relative to T-bills, adjusted for risk as measured by the standard deviation of returns.

- **Bond yields are very low relative to their historical range.** For triple A-rated sovereigns, this reflects ongoing uncertainty over the economic outlook and follows a bull market during recent decades. A similar picture is evident in the corporate, high yield and emerging market debt sectors, although the absolute level of yield is much higher than for SDR sovereigns, given the higher level of risks associated with these asset classes. As a result, prospective coupon income and bond returns (both nominal and real) are likely to be significantly lower than the experience over the past 25 years suggests.

- **Developed and emerging market equity yields are also low but not at their historic troughs.** Standard market data in Figure 10 reflect only current dividend yields, and a more comprehensive picture for equities requires assumptions about future growth. Basing future growth assumptions on the very long-run historical average in global markets, the results suggest relatively low return prospects by historical standards.²⁴

40. **Current *relative* valuations of equities (vis-à-vis bonds) are broadly in line with recent experience, but considerable uncertainties about return prospects persist.**

Market indicators suggest that the ex-ante risk premium of U.S. equities, for example, is around 2.9 percent (Figure 11, Box 2), consistent with its average over the past 25 years. However, considerable risks remain: in particular, the current risk premium is only about half the realized average since 1926, indicating that future long-run stock returns may be lower than suggested by historical experience. Moreover, the reference risk free rates, as noted above, are at historical lows, and their normalization, other things being equal, could further narrow the equity risk premium.

²⁴ There are several methodologies to approximate return prospects for equities. They include a dividend discount model, where expected real returns for equities are approximated by:

Expected Real Equity Return=Dividend Yield+Expected Real Dividend Growth

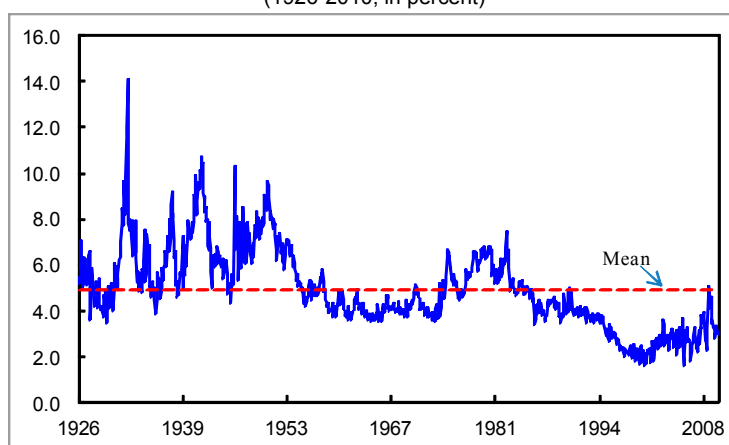
With dividend yields at around 2.5 percent, the approximation requires an assumption about the expected growth in real dividends. These growth estimates vary considerable, and one approach is to base the estimate on historical averages –suggesting a real growth rate of around 1 percent per annum (see for example Dimson, E., P. Marsh, and M. Staunton, *Credit Suisse Global Investment Returns Sourcebook 2010*, who find that real dividend growth averaged 0.8 percent over the last 110 years for the whole sample of 22 markets, and 1.1 percent in the U.S). This suggests an expected long-run real return from developed equity markets of around 3.5 percent per annum (2.5 percent+1 percent).

Box 2. Equity Risk Premium

The equity risk premium is defined as the return on equities minus a risk free rate of return, typically approximated by the return on treasury bills. To calculate an estimate of the ex ante equity risk premium requires a forecast for dividend growth. Real growth in dividends has averaged about 1 percent in the U.S. and somewhat less in other mature markets over the very long run. This assumption is embedded in the calculation of rolling ex-ante risk premia in Figure 11, which for simplicity focuses on U.S. data.

Based on these estimates, current U.S. ex-ante equity risk premia are around 2.9 percent, below their long-run average of 4.9 percent and only about half of the realized excess return of stocks during 1926–2010 (Attachment III). However, risk premia fluctuate considerably over time and the current levels are broadly in line with the recent experience (average of 3.2 percent since 1986).

Figure 11. U.S. Equity Risk Premium 1/
(1926-2010, in percent)



Sources: Ibbotson Associates, Robert Shiller's "Irrational Exuberance," Datastream, and staff calculations.

1/ Estimated equity return (dividend yield + 1 percent) minus cash return (30-day T-bill, inflation-adjusted). Data as of June 2010.

IV. CONCLUSIONS AND ISSUES FOR DISCUSSION

41. **This paper has reviewed key issues related to the gold endowment.** It assesses alternative broad strategies for the implementation of the expanded investment mandate in the context of two strategic financial objectives for the endowment: protecting its long-term purchasing power *and* providing a meaningful contribution to the long-term income needs of the Fund as envisaged under the new income model. In order to achieve these broad objectives and to mitigate risks, the paper concludes that a more diversified portfolio is needed than permitted under the existing investment mandate. Specifically, the analysis

suggests that consideration be given to investment in high quality non-government fixed income instruments and equities, covering both mature and emerging markets. Based on Directors' views on the issues raised in this paper, it is envisaged that staff will come back to the Board with more specific proposals.²⁵

42. Directors may wish to comment on the following issues:

- i. Do Directors concur with the need for the Fund's gold endowment to diversify into asset classes beyond those in the current IA, with a view to ensure a reasonable probability of achieving the broad financial objectives of the endowment?
- ii. Specifically, do Directors agree that, subject to appropriate safeguards, consideration should be given to the inclusion of significant allocations to mature market investment grade bonds and equities in the endowment? Would they also support further consideration of including emerging market investment grade bonds and equities?
- iii. Would Directors agree that it would be premature to give further consideration to the inclusion of alternative assets at this time?
- iv. What do Directors consider as a reasonable long-term real return objective for the Fund's gold endowment, which balances the need to generate a meaningful contribution to Fund income with the investment risks necessary to achieve that objective? In this context, do Directors support maintaining, for the time being, a real return of 3 percent as a reasonable long-term reference point, as assumed by the Committee?
- v. Would Directors concur that, consistent with the long-term nature of the gold endowment, a relatively longer-term return horizon of at least 3–5 years for assessing performance would be appropriate?

²⁵ See *Implementing the Fund's Expanded Investment Authority—Overview and Work Program* (SM/10/307, 12/1/10) for a discussion of the proposed work program.

Annex I. The Importance of Income and other Fundamental Factors in Long-Term Asset Returns

43. The first part of this annex sets out a decomposition analysis for long term asset returns for global equities and US investment-grade bonds since 1975. The analysis illustrates the role of income and other fundamentals as the main drivers of long-term total return, not just for bonds, but also for equities. Moreover, the contribution of fundamental factors to total returns has historically been more stable than other components, such as changes in market valuations.²⁶

44. The second part of the annex complements Section III of the paper, which covered the historical performance of illustrative portfolios based on broad indices. In particular, this part looks at equity investing strategies focused on dividends and other fundamental “value” factors, as discussed in Section II. A. The preliminary evidence suggests that, historically, such strategies provided opportunities for substantially higher risk-adjusted returns, including during periods of market turbulence such as the past decade.

Equities

45. Based on the form in which the return is distributed, historical equity returns can be decomposed into three components—inflation, real capital gain and income return. Income return of common stocks is distributed to investors through dividends, whereas capital gain is distributed through price appreciation. The real capital gain portion can be further broken down into real earnings per share (EPS) growth, and growth in price to earnings (P/E). The resulting decomposition of equity returns includes four components—inflation, growth in real EPS, growth in P/E, and dividend income return (*DivInc*). In Table I.1, real book value (*rbv*) and price to book (P/B) growth are substituted for EPS and P/E growth, respectively.²⁷ The equity return in period *t* (*R_t*) can then be decomposed as follows:

$$R_t = Inflation_t + g_{rbv} + g_{P/B} + DivInc_t + Res.$$

The residual term (*Res*) accounts for the interaction between the various components when they are compounded over several periods and is expected to be small compared to the other four.

²⁶ The analysis is performed at the index level and thus has a survivor bias (firms in bankruptcy disappear from the equity index; those downgraded below investment-grade fall out of the credit index).

²⁷ Using a decomposition based on book values instead of earnings avoids periods with negative earnings where the decomposition would not be meaningful. For similar results over 1975–2009, see *What Drives Long-Term Equity Returns*, MSCI Barra Research, January 2010. For details on the methodology, see “Long-Run Stock Returns: Participating in the Real Economy,” R. G. Ibbotson and P. Chen, *Financial Analysts Journal*, 59(1), 2003.

Table I.1. Decomposition of MSCI World Equity Returns
(In percent and U.S. dollar)

	1975-2010		1975-1979	1980-1989	1990-1999	2000-2009	Jan-Jun 2010 2/
	Mean	Volatility	Mean	Mean	Mean	Mean	Mean
Gross Return (USD) 1/	10.7	15.1	16.0	19.9	12.0	0.2	(9.6)
Inflation (U.S.)	4.1	1.3	8.1	5.1	2.9	2.5	1.2
Price to Book Growth	1.2	14.3	2.3	7.9	5.0	(7.8)	(12.6)
Real Book Value Growth	2.1	5.7	0.3	2.0	1.4	3.8	1.8
Dividend Income	2.9	0.4	4.6	3.6	2.2	2.2	1.4
Residual Interactions	0.4	1.0	0.6	1.3	0.5	(0.4)	(1.4)
Real Gross Return	6.6	15.1	7.8	14.8	9.0	(2.3)	(10.8)

Sources: Datastream, IFS, and staff calculations; annualized values. Data as of June 30, 2010.

1/ Total return including net dividends reinvested.

2/ Unannualized.

46. During the full period 1975–2010:

- The real rate of return averaged 6.6 percent (10.7 percent minus 4.1 percent).
- Dividend income return and real book value growth represented more than three-quarters of the return.²⁸ This “fundamental” component of return was remarkably stable.
- The “market” in terms of changes in price to book provided a further 1.2 percent in capital gain, but the volatility of this return component (14.3 percent) was relatively high, contributing nearly all of the standard deviation of the total return index.
- Global equities, in producing a 6.6 percent real rate of return, provided insurance against the risk of inflation and the erosion of purchasing power.

47. With respect to the intervening periods, key observations are:

- The “market” contribution to return can be significant and can be negative (2000–2009 and first half of 2010).

²⁸ This phenomenon is even more pronounced when longer time series of, say, 50 or 100 years are used. See, for example, Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Equity Return Sourcebook 2010*. (Chapter 2 *Risk and Risk Premiums*).

- Despite a decrease in the proportion of firms paying dividends,²⁹ dividends and real book-value growth remained resilient, particularly in periods of equity bear markets.³⁰

48. Overall, equities have historically provided considerable benefit to a long-term investor who seeks a growing income stream and protection against inflation.

Fixed Income

49. Table I.2 below sets out the long term returns for the Barclays U.S. Aggregate Bond index.

Table I.2. Decomposition of the Barclays U.S. Aggregate Bond Index Returns
(In percent and U.S. dollar)

	1975-2010		1975-1979	1980-1989	1990-1999	2000-2010
	Return	Volatility	Return	Return	Return	Return
Total Nominal Return	8.5	5.7	5.9	12.4	7.9	6.7
Inflation	4.1	1.3	8.1	5.1	2.9	2.5
Price Return	0.5	5.6	(2.1)	1.3	0.3	1.2
Real Coupon Return	3.9	1.3	(0.0)	6.0	4.7	3.1
Total Real Return	4.4	6.0	(2.3)	7.4	5.0	4.2

Sources: Datastream, IFS, and staff calculations. Data as of June 30, 2010.

Note: Barclays U.S. Treasury index until December 1975, then Barclays U.S. Aggregate Bond index.

50. Out of a total nominal return of 8.5 percent from 1975–2010, the return from coupons represented the dominant component contributing 8 percent. The market or price changes emanating from movement in interest rates contributed little of the return but nearly all of the volatility during the period. Coupons also contributed the bulk of total return during the four sub-periods considered.

51. As previously noted in the main text of the paper, fixed income securities of many sovereigns benefited from exceptional market conditions and decreasing inflationary pressures since the 1980s. This boosted real rates of return during this period. Given current low yields, however, this performance may be difficult to achieve in coming years.

²⁹ See, for example, Fama, E. and Kenneth French, “Disappearing Dividends: Changing Firm Characteristics, or Lower Propensity to Pay?” *Journal of Financial Economics* 60 (2001) 3–43.

³⁰ See, for example, Fuller, Kathleen P. and Michael A. Goldstein, “Do Dividends Matter More in Declining Markets?” (2005). Available at SSRN: <http://ssrn.com/abstract=687067>

Equity “Value” Strategies: Selected Comparisons with Standard Indices

52. Table I.3 below presents the long term returns and standard deviation for standard U.S. and international equity market indices and a range of stylized “value” strategies. These strategies seek to exploit the historical feature that dividends and other fundamental factors represent the bulk of a stock’s real return over the long term. They focus on fundamental measures, including earnings and cash flow yields, price-to-book ratios, and dividend yields, in selecting or weighting individual securities.³¹ The results in Table I.3 utilize 34 years of data, compared to 24 years in Section III’s analysis of illustrative portfolios. Consistent with empirical evidence from earlier studies, value-focused strategies have produced substantially higher returns during this period than the benchmark indices even after adjusting for risk.³² On a decade-by-decade basis, these strategies have also generated excess returns consistently, except during the 1990’s in the U.S., when growth stocks led the overall market.

53. Figure I.1 shows the risk-return trade-off of value strategies relative to market indices for the 2000’s decade, characterized by two bear markets. The results suggest that value strategies outperform market indices during turbulent market periods, with broadly equal or only moderately higher risk. Dividends, in particular, help to provide a cushion in declining markets because many companies are resistant to cutting them.

³¹ All the equity indices in Table I.3 are investable, while the equity portfolios are not directly investable. However, some asset management firms (e.g., Dimensional) offer core equity strategies that provide higher exposure to Fama French factors.

³² For a comprehensive survey of the academic literature, see Christopher H. Browne, William H. Browne, Thomas H. Shrager, John D. Spears, and Robert Q. Wyckoff, Jr. (2009), *What Has Worked in Investing: Studies of Investment Approaches and Characteristics Associated with Exceptional Returns*, Tweedy, published by Browne Company LLC. See also Chan, L. K. C. and J. Lakonishok (2004), “Value and Growth Investing: Review and Update,” *Financial Analysts Journal*, January/February, pp. 71–86.

Table I.3. U.S. and International Equity Returns and Volatility
(In percent)

	Inception Date	1970's	1980's	1990's	2000's	1975-2009		Sharpe Ratio
						Return	Volatility	
U.S. CPI 1/	Dec-27	7.37	5.09	2.93	2.52	4.16	1.27	n.a.
U.S. 30 day T-Bill 2/	Jan-26	6.31	8.89	4.93	2.64	5.63	0.89	n.a.
Bond Indices								
U.S. Government 3/	Jan-26	7.03	12.11	7.48	6.24	8.22	5.32	0.49
Equity Indices								
S&P 500 4/	Jan-26	5.85	17.55	18.16	(0.95)	11.72	15.48	0.39
MSCI World	Jan-70	6.96	19.92	11.96	0.23	11.18	15.01	0.37
MSCI World Value	Jan-75	n.a.	21.92	11.18	2.44	12.59	14.83	0.47
MSCI World Growth	Jan-75	n.a.	18.06	12.70	(2.23)	9.63	15.88	0.25
MSCI World High Dividends	Jul-95	n.a.	n.a.	n.a.	4.33	n.a.	n.a.	n.a.
RAFI U.S. 1000 5/	Dec-61	8.70	19.12	16.92	4.74	12.43	15.74	0.43
RAFI U.S. 1500 5/	Jan-79	n.a.	18.23	15.30	10.55	n.a.	n.a.	n.a.
RAFI ex-U.S. 5/	Oct-85	n.a.	n.a.	9.76	5.86	n.a.	n.a.	n.a.
Equity Portfolios								
High Dividend Countries 6/	Feb-70	n.a.	24.64	14.69	7.39	14.02	17.75	0.47
Fama French B/M 7/	Jul-26	13.86	20.64	14.73	6.00	13.57	16.61	0.48
Fama French E/P 8/	Jul-51	11.90	18.82	17.12	7.76	14.25	16.44	0.52
Fama French D/P 9/	Jul-27	10.07	20.10	13.66	5.57	12.12	14.14	0.46
Fama French CF/P 10/	Jul-51	12.43	19.63	15.72	7.32	13.85	15.43	0.53

Sources: Bloomberg, Robert Shiller's Irrational Exuberance, Datastream, Ibbotson Associates, IFS, Kenneth R. French's data library, Research Affiliates, and IMF staff calculations.

Notes: "n.a." indicates not available. Data as of December 31, 2009 (end date of Fama-French return series).

1/ Robert Shiller's "Irrational Exuberance" from December 31, 1927 to January 31, 1957. IFS thereafter.

2/ Ibbotson Associates up to June 30, 2001, then DataStream.

3/ Ibbotson Associates' intermediate bonds up to December 31, 1972, then Barclays U.S. Aggregate Government Bond Index.

4/ Ibbotson Associates until June 30, 1995, then Bloomberg.

5/ The RAFI index family (selects and weights securities using fundamental metrics such as cash flow, sales, book value, dividends to break the linkage between portfolio weight and any over- or under-valuation).

6/ Invested in the five countries of the MSCI EAFE plus the MSCI U.S. and MSCI Canada with the highest dividend yield in the preceding month.

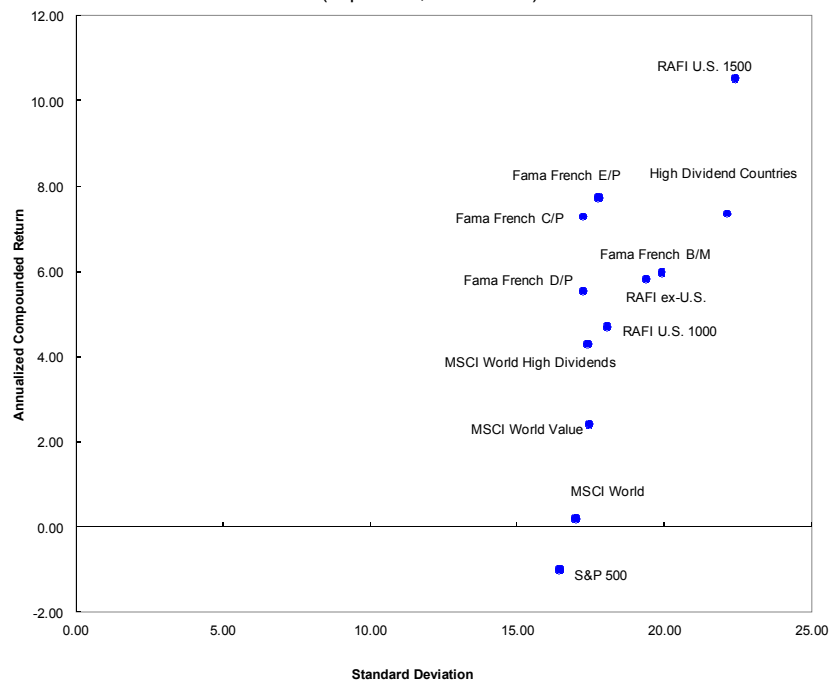
7/ 30 percent of stocks with the highest book-to-market ratio in the NYSE, AMEX, NASDAQ universe.

8/ 30 percent of stocks with the highest earnings yield in the NYSE, AMEX, NASDAQ universe.

9/ 30 percent of stocks with the highest dividend yield in the NYSE, AMEX, NASDAQ universe.

10/ 30 percent of stocks with the highest cash-flow yield in the NYSE, AMEX, NASDAQ universe.

Figure I.1. Investment Return against Risk
(in percent, 2000-2009)



Sources: see Table I.3.

Annex II. World Bank Investment Practice—The Case of the Long-Term Income Portfolio

54. **The World Bank (IBRD and IDA) manages six different investment pools.** The investment guidelines for these pools reflect their respective funding costs, operational liquidity needs, as well as investment horizons and risk tolerance levels. In addition, the Bank also manages over 1,000 trust funds assets to support lending operations to its members. A single governance structure applies to all World Bank and Trust Account investments. The range of eligible securities is also similar for all investment pools, although in practice this range is not fully utilized in each pool. Eligible instruments include: government bonds; obligations issued by government agencies, official entities, and multinational organization (including asset-backed and mortgage-backed securities); corporate bonds; bank deposits; obligations issued or unconditionally guaranteed by banks or other financial institutions; short-term borrowings from commercial banks and other financial institutions; securities lending and repo operations; exchange-traded futures and options; forward rate agreements and swaps; some OTC options; and equity securities (including commingled or mutual funds and exchange traded funds, convertible securities, American and global depositary receipts, warrants, participation notes, swaps, and exchange-traded futures and options).

55. **This appendix focuses on the IBRD's Long-Term Income Portfolio (LTIP), which resembles in some respects most closely the Fund's gold endowment.** In particular, it has a very long-term horizon and a return objective aimed at generating substantial real returns over time (see below).

Objectives and general principles

56. **The International Bank for Reconstruction and Development (IBRD) holds a part of its usable capital in the LTIP, a diversified portfolio of assets.** The primary objective is to maximize returns within reasonable and prudent levels of risk. Funds are not expected to be disbursed, but to be used to strengthen the Bank's reserves. The draw rate is thus only a notional reallocation of income and does not involve an actual resizing of the portfolio.³³ As funding originated from the part of the Bank's capital denominated in U.S. dollar, the latter currency is the portfolio's choice of numeraire. The return objective is Libor plus 2.6 percent per annum, with a view to increase IBRD's allocable income over time.

³³ The Bank's management determined the following draw rate mechanism for the first 3-year implementation period: 5 percent (corresponding to the average six-month forward Libor rate over the next 10 years) times the trailing (up to 3 years) portfolio average balance. This amount is recategorized annually as allocable income.

Target asset allocation

57. **IBRD's Board approved in April 2008 a US\$3 billion portfolio comprised of 60 percent developed market public equities and 40 percent developed market fixed-income investments.** The equity tranche is evenly split between U.S. equities (anchored to the Russell 3000 index) and non-U.S. developed equities (anchored to the MSCI World ex-U.S. index) and hedged back to U.S. dollar. The fixed-income tranche is split 70/30 between a hedged global G7 government bond portfolio (anchored to the Barclays Global Treasury G7 index) and a U.S. mortgage backed securities (MBS) portfolio (managed against the Barclays U.S. MBS index). Within each asset class, the actual asset allocations can vary by +/- 5 percentage points from the target shares (e.g., the US equity tranche could be in the range of 25–35 percent of the portfolio total).

Implementation considerations

58. Portfolio implementation began in November 2008 and, to avoid undue timing risk, the Board approved a gradual funding of the portfolio. Equities were phased on a monthly basis, while bonds were funded at six-month intervals. The first US\$1 billion was funded by July 2009 but, over the course of 2009, a decision was made not to fully fund the entire US\$3 billion portfolio because of a changed outlook for IBRD's capital. The equity portfolio is managed passively through one external manager. The fixed-income portfolio is managed in-house with some limited deviation. Inception-to-date returns through May 2010 were 14.6 percent.

Annex III. Conflict of Interest Considerations under the Fund's Expanded Investment Authority

Given the nature of the Fund and the confidential and other non-public information it receives in carrying out its mandate, an external review was conducted in 2007 to assess (i) the potential risk to the Fund for actual or apparent conflicts of interest in the conduct of its expanded investment authority, (ii) whether the governance and conflict of interest policies and arrangements contemplated for the expanded investment authority are adequate to address these actual or perceived conflicts of interest, and (iii) to make recommendations on any changes or enhancements to the governance and conflicts of interest policies and arrangements contemplated for the expanded investment authority.³⁴ The report concluded that the Fund's current governance and conflict of interest policies and arrangements are generally adequate to address actual or perceived conflicts of interest that can be reasonably expected from the proposed expanded investment authority, subject to a number of recommended enhancements. In assessing the Fund's safeguards, the external review emphasized the following points:

- **Separation of responsibilities**

The division of responsibilities and the hierarchy of the decision-making process reduce the likelihood for actual and perceived conflicts of interest. In particular, the fact that the Board's role is—and would continue to be—limited to establishing the broad direction of the Fund's investment strategy and the high-level policies to guide that strategy would mitigate the perceived risk that confidential information received by the Executive Board would be used when making investments.³⁵ This is further enhanced by the fact that for the most part, individual investment decisions for specific investments are and will continue to be taken by external managers who do not have access to non-public information that may be possessed by Fund staff (including in the case of countries in which the Fund is providing or is likely to provide financial assistance).

- **Conflict mitigation policies and enhanced oversight**

Fund staff responsible for investments would continue to be guided by a set of policies and procedures that specify standards of professional conduct in the investment process, and measures to restrict access to, and avoid discussion of non-public information. In addition, the report proposed to enhance the profile of senior management in the Fund's policies for

³⁴ The external review was conducted by the international law firm of Wilmer Hale. The full report is provided in *Developing a New Income Model for the Fund—Additional Considerations—Supplementary Material* (SM/08/48, Sup.1, 2/8/08).

³⁵ See *Developing a New Income Model for the Fund—Additional Considerations* (SM/08/48, 2/1/08).

mitigating conflicts of interest by giving a senior officer a more direct role in the design and implementation of investment-related compliance controls.

- **Specialized asset classes**

Fund investments in certain asset classes labeled as “specialized asset classes”—including some alternative investments or securities of members to whom the Fund is providing or likely to provide financial assistance—would warrant additional controls to address the increased risk of perceived conflicts of interest. Specifically, the report suggested using external managers, whose mandate would encompass a broad range of investments based on widely used benchmark indices, engaging a “manager of managers,” or adopting a passive investment approach around publicly available benchmark indices as three options that could address this risk.³⁶

- **Contractual modifications**

Although the contracts with external managers preclude the use of confidential information, the external review recommended including a clause requiring external managers to report to the Fund any instances where a staff member has communicated or attempted to communicate non-public information to them.

³⁶ In their discussion of the report, most Directors preferred the first and third option to the alternative option of using a manager of managers, particularly in order to ensure that the Fund continues to exercise its fiduciary responsibilities effectively. See *The Chairman’s Summing Up; Developing a New Income Model for the Fund—Additional Considerations* (BUFF/08/29, 2/28/08).

ATTACHMENT I. STRUCTURE OF ILLUSTRATIVE PORTFOLIOS AND DATA SOURCES 1/

IA –Short-Term Government Bonds	SDR-weighted Merrill Lynch 1-3 year index (Jan 1987-present)
FI –Global Bonds	100% Barclays Global G7 Treasury index (Jan 1987-Aug 2000) Barclays Global Aggregate index ex-Emerging Markets (Sept 2000-present)
B1 –Broadly Diversified Bond/Equity (Developed Markets)	60% MSCI World Developed Markets (Jan 1987-present) 40% Barclays Global G7 Treasury index (Jan 1987-Aug 2000) Barclays Global Aggregate index ex-Emerging Markets (Sept 2000-present)
B2 –Broadly Diversified Bond/Equity (Developed Markets)	53% MSCI World Developed Markets (Jan 1987-present) 7% MSCI Emerging Markets (Jan 1988-present) 40% Barclays Global G7 Treasury index (Jan 1987-Aug 2000) 36% Barclays Global G7 Treasury index (Jan 1987-Aug 2000) Barclays Global Aggregate index ex-Emerging Markets (Sept 2000-present) 4% Merrill Lynch Emerging Market Bond Index+ (Jan 1992-Dec 1993) JP Morgan EMBI+ Index (Jan 1994-present)
DR –Diversified Risk	33% Barclays Global Inflation-Linked index (March 1997-present) 33% Barclays Global G7 Treasury index (March 1997-present) 33% MSCI World Developed Markets (March 1997-present)
EP –Endowment Pension	<u>Jan 1987-Dec 1987</u> 48% MSCI World Developed Markets 19% Barclays Global G7 Treasury index 15% GSCI Commodity Index 18% Nareit Index <u>Jan 1988-Dec 1989</u> 43% MSCI World Developed Markets 19% Barclays Global G7 Treasury index 15% GSCI Commodity Index 18% Nareit Index 5% MSCI Emerging Markets <u>Jan 1990-Dec 1991</u> 43% MSCI World Developed Markets 19% Barclays Global G7 Treasury index 10% GSCI Commodity Index 13% Nareit Index 5% MSCI Emerging Markets 11% HFRI Hedge Fund Index <u>Jan 1992-Sept 1995</u> 43% MSCI World Developed Markets 15% Barclays Global G7 Treasury index 10% GSCI Commodity Index 13% Nareit Index 5% MSCI Emerging Markets 4% Merrill Lynch Emerging Market Bond Index+ (Jan 1992-Dec 1993) JP Morgan EMBI+ Index (Jan 1994-Dec 2008) 11% HFRI Hedge Fund Index <u>Oct 1995-Present</u> 43% MSCI World Developed Markets 15% Barclays Global G7 Treasury index (Jan 1987-Aug 2000) Barclays Global Aggregate index ex-Emerging Markets (Sept 2000-present) 10% GSCI Commodity Index 8% Nareit Index 5% MSCI Emerging Markets 4% JP Morgan EMBI+ Index 11% HFRI Hedge Fund Index 5% Red Rock Private Equity Index

1/The composition of the portfolios changes over time due to data availability.

ATTACHMENT II. ILLUSTRATIVE PORTFOLIO RISK-RETURN CHARACTERISTICS (1987–2010)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Jan-May 2010 1/	Jan 1987- May 2010
SDR Nominal Returns (annualized percent)														
IA	6.5	2.5	6.0	6.4	5.4	2.6	2.3	2.1	2.8	5.4	7.4	2.3	1.8	5.5
FI	9.0	-1.0	8.0	5.3	8.0	2.9	4.8	3.6	1.1	4.5	7.8	4.8	4.7	6.4
B1	15.6	16.4	-2.2	-5.9	-12.9	14.4	8.3	13.0	9.0	4.7	-22.5	18.9	1.8	6.7
B2	10.7	20.2	-3.3	-4.8	-12.0	16.4	9.1	15.5	10.0	6.5	-24.2	22.5	2.1	7.4
DR	12.4	10.2	2.3	-1.6	-2.7	10.7	8.3	9.3	5.1	5.7	-11.4	12.8	2.6	5.7 2/
EP	0.8	30.6	5.2	-5.7	-11.0	19.5	11.4	19.8	9.0	4.5	-32.1	25.0	2.8	8.1
SDR Standard Deviation of Nominal returns (percent)														
IA	1.0	0.7	0.8	1.3	1.5	1.2	1.0	0.8	0.6	1.2	2.3	0.7	0.3	1.8
FI	3.3	2.7	2.6	3.2	2.5	3.5	2.9	2.6	2.4	2.5	4.6	2.9	0.5	3.7
B1	11.2	8.2	7.8	10.7	11.7	6.9	3.5	5.1	4.3	5.1	13.1	12.5	3.1	9.3
B2	13.7	9.1	7.8	11.6	12.3	7.2	3.9	6.0	5.0	5.5	14.3	12.7	3.1	9.8
DR	6.5	5.4	4.7	5.9	5.3	4.4	3.2	3.1	2.9	2.2	8.8	8.2	5.4	5.6 2/
EP	15.3	11.1	8.1	12.7	13.4	7.9	3.9	7.2	5.5	7.5	18.9	15.8	4.1	10.9
SDR Real Returns (annualized percent)														
IA	5.2	1.0	3.7	5.1	3.2	0.8	-0.3	-0.2	0.5	2.0	6.7	0.8	1.1	3.1
FI	7.7	-2.5	5.6	4.0	5.7	1.1	2.1	1.2	-1.2	1.1	7.1	3.3	4.1	3.9
B1	14.2	14.7	-4.3	-7.0	-14.7	12.4	5.5	10.5	6.5	1.2	-23.0	17.1	1.2	4.2
B2	9.4	18.5	-5.4	-5.9	-13.8	14.3	6.3	12.9	7.5	3.0	-24.7	20.7	1.5	4.9
DR	11.0	8.6	0.1	-2.8	-4.7	8.8	5.6	6.8	2.8	2.3	-12.0	11.2	2.0	3.7 2/
EP	-0.4	28.7	2.9	-6.9	-12.8	17.4	8.6	17.0	6.6	1.1	-32.6	23.1	2.2	5.6
Excess Return over SDR Inflation plus 3 Percent														
IA	2.1	-2.0	0.7	2.0	0.1	-2.2	-3.3	-3.1	-2.5	-1.0	3.5	-2.2	-0.1	0.1
FI	4.5	-5.4	2.5	1.0	2.6	-1.9	-0.9	-1.8	-4.1	-1.9	3.9	0.2	2.8	0.9
B1	10.9	11.3	-7.2	-9.8	-17.3	9.1	2.4	7.2	3.4	-1.7	-25.3	13.7	0.0	1.1
B2	6.1	15.0	-8.2	-8.7	-16.4	11.0	3.2	9.6	4.3	0.0	-26.9	17.2	0.2	1.8
DR	7.8	5.4	-2.9	-5.6	-7.6	5.6	2.5	3.7	-0.3	-0.7	-14.6	7.9	0.7	0.7 2/
EP	-3.4	25.0	-0.1	-9.6	-15.4	14.0	5.4	13.6	3.4	-1.9	-34.6	19.6	0.9	2.5
Sharpe Ratio (over SDR Rate)														
IA	2.2	-1.4	1.9	2.0	2.0	0.7	0.5	-0.5	-1.5	1.1	2.0	2.7	6.2	0.7
FI	1.5	-1.7	1.4	0.5	2.2	0.3	1.0	0.4	-1.1	0.1	1.1	1.5	9.2	0.6
B1	1.0	1.6	-0.9	-0.9	-1.3	1.8	1.8	2.0	1.2	0.1	-1.9	1.5	0.6	0.2
B2	0.5	1.8	-1.0	-0.7	-1.2	2.0	1.9	2.2	1.3	0.4	-1.9	1.7	0.6	0.3
DR	1.3	1.2	-0.4	-0.9	-0.9	2.1	2.0	2.1	0.5	0.7	-1.6	1.5	0.5	0.5 2/
EP	-0.2	2.4	0.1	-0.7	-1.0	2.3	2.5	2.4	1.0	0.0	-1.9	1.6	0.7	0.3
Minimum Monthly Return (SDR)														
IA	0.2	-0.1	0.1	-0.1	-0.4	-0.3	-0.5	-0.2	0.0	-0.1	-0.5	-0.2	-0.1	-1.4
FI	-0.8	-1.5	-0.6	-1.4	-1.0	-1.9	-1.6	-0.9	-1.2	-0.7	-0.9	-1.0	0.2	-2.6
B1	-7.7	-2.0	-3.0	-5.2	-6.2	-2.2	-1.4	-1.5	-2.6	-2.4	-9.4	-5.5	-3.6	-10.5
B2	-10.0	-2.0	-3.3	-5.8	-6.4	-2.0	-1.1	-1.8	-3.3	-2.8	-10.5	-5.2	-3.5	-10.5
DR	-3.8	-1.1	-1.5	-2.8	-2.7	-0.8	-1.6	-1.3	-1.1	-0.6	-6.9	-4.3	-1.5	-6.9 2/
EP	-12.4	-2.0	-2.9	-7.2	-6.2	-1.9	-1.6	-2.5	-3.6	-4.4	-14.9	-7.0	-4.7	-14.9
Maximum Monthly Return (SDR)														
IA	1.1	0.6	1.0	1.1	1.0	0.8	0.6	0.5	0.5	1.2	1.6	0.4	0.7	2.9
FI	2.6	1.1	1.9	1.7	1.6	1.6	1.8	1.2	1.1	1.2	3.0	1.6	1.4	3.2
B1	4.9	4.8	4.1	4.0	4.4	5.0	2.0	3.1	2.0	2.1	3.7	6.8	4.5	6.8
B2	5.4	5.4	3.6	3.9	4.7	5.2	2.1	3.4	2.2	2.4	4.1	7.4	4.7	7.4
DR	3.5	2.9	2.9	2.4	1.6	2.9	1.5	2.1	1.8	1.3	2.3	3.6	2.7	3.6 2/
EP	4.7	7.4	4.6	4.4	4.7	4.7	2.3	4.1	2.7	3.1	5.5	9.4	5.7	9.4
Memo Items:														
SDR Inflation	1.2	1.5	2.2	1.2	2.1	1.8	2.6	2.3	2.3	3.4	0.7	1.5	0.6	2.4
SDR 3-Month Interest Rate	4.2	3.5	4.5	3.7	2.3	1.7	1.8	2.6	3.7	4.2	2.8	0.4	0.1	4.4

Sources: Datastream, staff calculations.

1/ Partial period, unannualized.

2/ Partial period, March 1997–May 2010, annualized.

ATTACHMENT III. ILLUSTRATIVE PORTFOLIO RISK-RETURN CHARACTERISTICS

(1926–2009)

(in percent)

	Annualized Real Return by Decade									1926-2009		
	1926-1929	1930's	1940's	1950's	1960's	1970's	1980's	1990's	2000's	Return	Standard Deviation	Sharpe Ratio
US Markets												
T-Bill	4.9	2.6	-4.7	-0.3	1.3	-1.1	3.6	2.0	0.3	0.6	1.8	0.00
Intermediate Bonds	5.2	6.8	-3.4	-0.7	0.8	-0.6	6.6	4.3	3.6	2.2	4.8	0.26
Long Bonds	5.7	7.1	-2.1	-2.1	-1.2	-2.6	7.6	6.4	4.6	2.3	8.6	0.21
Corporate Bonds	6.4	9.2	-2.6	-1.1	-0.8	-2.0	8.1	5.5	5.4	2.8	7.7	0.25
Equities	22.5	1.0	4.1	15.7	5.1	-0.2	10.5	15.1	-3.0	6.6	19.3	0.36
FI 1/	6.1	8.2	-2.3	-1.6	-1.0	-2.2	7.9	6.0	5.1	2.6	7.8	0.23
B1 2/	16.2	5.1	1.9	8.5	2.7	-0.9	9.7	11.8	0.5	5.4	12.6	0.38
UK Markets												
T-Bill	6.2	0.9	-2.0	-1.2	1.9	-3.3	4.8	4.5	1.8	1.1	6.5	0.00
Govt Bonds	5.0	5.8	0.5	-3.2	-1.9	-4.1	6.9	8.3	2.6	1.9	13.7	0.06
Equities	5.1	4.3	3.8	12.9	4.4	-2.3	15.6	10.7	-1.2	5.8	20.2	0.29
B1 2/	5.2	5.1	2.6	6.7	2.3	-2.1	12.3	9.9	0.9	4.7	15.7	0.24
Germany												
T-Bill	4.6	6.3	-21.9	1.1	0.9	0.2	3.3	3.1	1.2	-0.8	2.9	0.00
Govt Bonds	6.1	9.4	-20.4	2.8	3.2	3.0	5.3	6.2	4.0	1.5	3.4	0.68
Equities	16.8	6.5	-9.5	23.1	3.5	-2.6	12.8	9.6	-2.5	5.2	5.7	1.07
B1 2/	12.8	8.0	-13.8	14.9	3.6	-0.2	10.2	8.6	0.9	4.1	4.3	1.15
France												
T-Bill	-3.3	-0.5	-23.1	-1.9	0.4	-0.2	4.4	4.7	1.2	-2.3	1.7	0.00
Govt Bonds	11.2	0.2	-23.5	-0.5	0.4	-3.1	7.8	8.9	4.1	-0.7	3.1	0.54
Equities	17.8	-4.3	-8.8	17.4	0.6	-2.2	14.1	12.2	-1.9	3.6	6.4	0.94
B1 2/	15.6	-2.1	-14.0	10.3	0.7	-2.1	12.0	11.3	1.0	2.4	4.3	1.10
Japan												
T-Bill	9.8	-0.6	-33.1	5.3	0.5	-3.3	2.7	1.5	0.5	-3.5	2.7	0.00
Govt Bonds	14.0	4.0	-35.2	0.4	6.2	-2.0	6.8	5.9	2.0	-1.8	3.8	0.45
Equities	5.5	10.4	-25.1	27.6	8.5	3.4	20.0	-5.3	-4.8	3.2	6.8	1.00
B1 2/	8.9	8.2	-28.2	17.3	8.1	1.5	14.9	-0.3	-1.7	1.9	4.7	1.14
Mix US/UK Allocation 32/												
T-Bill	5.5	1.8	-3.3	-0.7	1.6	-2.2	4.2	3.2	1.0	0.9	3.6	0.00
Govt Bonds	5.4	6.6	-0.6	-2.5	-1.5	-3.0	7.4	7.4	3.7	2.3	10.1	0.13
Equities	13.9	3.6	4.7	14.8	5.0	-0.1	13.2	13.1	-2.3	6.7	18.3	0.31
B1 2/	10.7	5.5	2.7	7.9	2.7	-0.8	11.1	10.9	0.6	5.3	12.6	0.34
Mix Developed World 4/												
T-Bill	4.3	2.3	-10.8	0.2	1.1	-1.2	3.7	2.9	0.8	0.0	5.7	0.00
Govt Bonds	7.9	6.2	-9.1	-0.5	0.7	-1.6	7.2	7.0	4.1	1.9	9.8	0.20
Equities	18.8	3.8	2.1	19.9	5.1	0.3	13.8	11.6	-2.8	7.0	18.0	0.39
B1 2/	14.8	5.3	-2.3	11.9	3.5	-0.2	11.3	10.0	0.9	5.4	12.4	0.44

Note: Returns are in local currencies and are deflated by the consumer price index of relevant country.

1/ Fixed Income (FI) performance is proxied by returns on an even split of long-duration U.S. government and corporate bonds.

2/ B1 performance is proxied by returns on an allocation of 60 percent equities (S&P500, U.K. equities) and 40 percent long-duration U.S. government bonds (U.K. gilts).

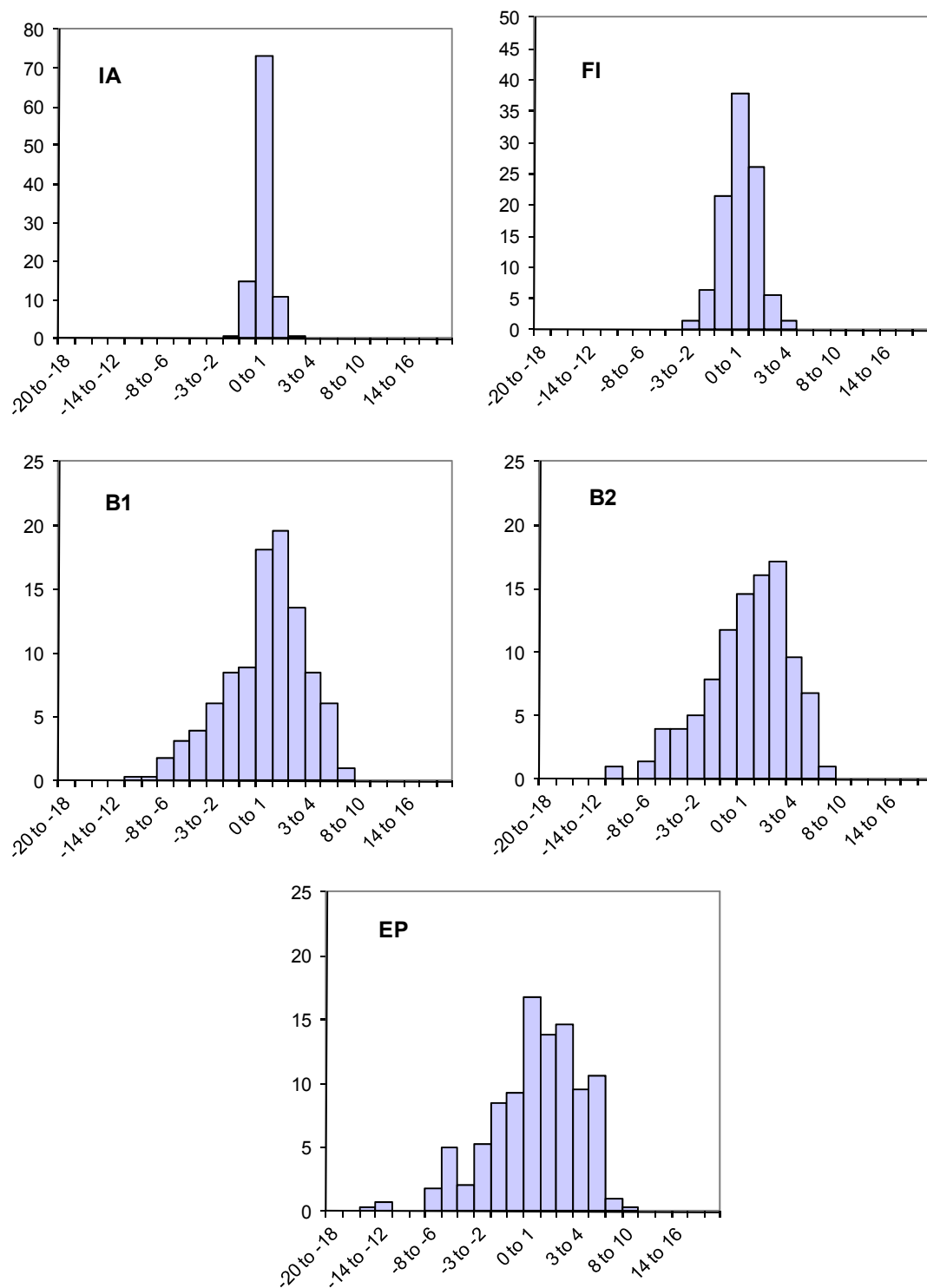
3/ Asset class and portfolio returns computed based on an even split of U.S. and U.K. exposure.

4/ Asset class and portfolio returns computed based on an allocation of 44 percent for the US market, 17 percent for Germany and France, 11 percent for Japan and the UK.

Sources: Ibbotson data (US markets), Barclays Capital (UK markets, US market since 2008), Global Financial Data (Japan, France, Germany), Bloomberg, and staff calculation.

ATTACHMENT IV. ONE-YEAR RETURN DISTRIBUTION OF ILLUSTRATIVE PORTFOLIOS

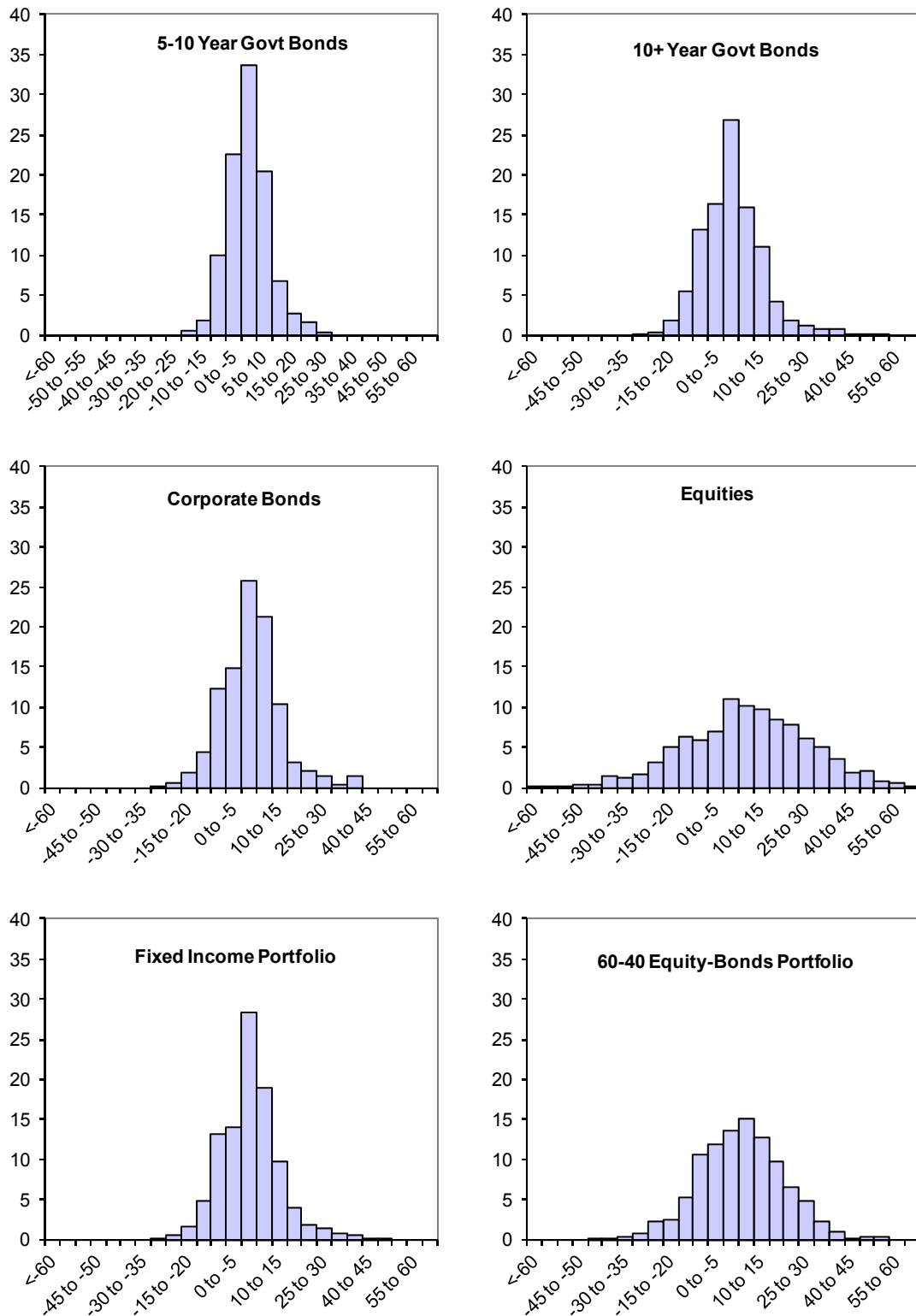
(1987–2010, SDR nominal terms, in percent)



Sources: Datastream and staff calculations.

ATTACHMENT V. LONG-RUN RETURN DISTRIBUTION

(U.S. Market, 1926–2009, in real terms and in percent over rolling one-year periods)



Sources: Ibbotson Associates, staff calculation.