

The Ministry of Finance's Investment Strategy Council

Ministry of Finance
P.O. Box 8008 Dep
0030 Oslo

The Fixed Income Benchmark of the Government Pension Fund - Global

Executive summary

In this letter the Advisory Council on Investment Strategy sets out its view on three key issues relating to the composition of the fixed income benchmark (FIBM) portfolio of the Government Pension Fund – Global:

- (i) Should it be extended to include instruments with a credit rating below “investment grade” (high yield corporate bonds)?
- (ii) Should it be extended to include emerging market bonds issued in “soft currency”?
- (iii) Should it be divided into two distinct asset classes, separating liquid government bonds with negligible credit risk from other bonds?

Analysis of historical performance shows that high yield bonds have outperformed investment grade and government bonds over long horizons, but high yield bonds have also been subject to much more volatility. High yield bonds have performed more like equities with negative average excess returns during a recession, and excess returns compared to treasuries and other less risky fixed income instruments in a normal, expansionary phase of the cycles. Hence, treasuries possess superior risk diversification properties for the Government Pension Fund - Global. Considering also the reputational risks, the Council does not recommend including high yield bonds in the Fund's fixed income benchmark.

Regarding the second question above, there is limited data available to analyze historical performance of emerging market bonds issued in soft currency. Furthermore, including this asset class in the Fund's benchmark would raise important operational challenges. Therefore, the Council does not recommend including emerging market bonds in soft currency in the fixed income benchmark now. As more information on these markets becomes available, the issue should be re-examined.

The third issue concerns whether one should split the fixed income benchmark in two separate asset classes, each with fixed portfolio weights that are subject to rebalancing. Such a separation would recognize that the two classes of bonds have different return, risk and correlation characteristics. It could also facilitate a better allocation of credit and liquidity risk in the benchmark portfolio, and may improve the performance of the rebalancing regime as well. Splitting the fixed income benchmark into two parts requires more analysis of how this may affect the Fund's expected risk and return characteristics, however. Based on the above recommendations regarding high yield corporate bonds and soft currency emerging market bonds, the need for a separation of the fixed income portfolio is less urgent. The Council recommends further analysis of portfolio weights and of the rebalancing mechanism before a decision is made.

1 Background

The Council supports the Ministry's initiative to have a closer look at the composition of the fixed income benchmark (FIBM) of the Government Pension Fund – Global. In recent years, several important changes to the investment strategy have been carried out. A higher equity allocation has lifted the Fund's expected risk and return, while increased diversification will be achieved by the inclusion of small cap stocks and emerging markets in the equity benchmark, and by building up a real estate portfolio. Against this backdrop, it would now seem appropriate to give more attention to the fixed income asset class.

Responding to the Ministry's request of 5 December 2008, the Advisory Council on Investment Strategy sets out its view on three key issues relating to the composition of the FIBM:

- (i) Should it be extended to include instruments with a credit rating below "investment grade" (high yield corporate bonds)?
- (ii) Should it be extended to include emerging market bonds issued in "soft currency"?
- (iii) Should it be divided into two distinct asset classes, separating liquid government bonds with negligible credit risk from other bonds?

The Council notes that Norges Bank has also presented its views on whether to include high yield corporate bonds and emerging market bonds issued in soft currency in the benchmark portfolio, cf. the Bank's letter of 3 November 2008.

In this letter, we first consider the current fixed income benchmark. Section 3 takes a closer look at high yield bonds and section 4 discusses emerging market bonds. The question of splitting the fixed income benchmark into two separate asset classes is considered in section 5. The conclusions are summarized in section 6. The appendix provides more detailed information about high yield and emerging market bonds.

2 The current fixed income benchmark

A crude estimate of the size of the global bond market, is USD 60 trillion, as of yearend 2007, excluding debt with remaining maturity less than one year.¹ A large share of these bonds is issued in the US or within the EU. The value of the global bond market is significantly larger than the coverage of the indices constituting the FIBM. This is due to the fact that short term debt and debt with floating rate are not included in these indices, and that domestic debt in local currency and debt not satisfying the inclusion criteria are excluded from the indices.

In the current FIBM comprising debt from 1 600 issuers across the currencies of 21 countries, all bonds have to be of investment grade credit quality and denominated in hard currency. In addition, the bond markets have to be open to foreigners as well as having satisfactory legislation regarding investors' right, and satisfy minimum requirements concerning settlement systems, size, liquidity, and political and macroeconomic stability. The markets should also contribute to increasing the expected risk-adjusted portfolio return.

Today's FIBM has a fixed 40% weight in the Fund's strategic benchmark portfolio. This weight is set to be reduced towards 35% as the real estate portfolio is being built up, leaving listed equities with a strategic weight of 60%. While market movements will tend to push the

¹ Measured as amounts outstanding of international and domestic debt securities by residence of issuer, converted into US dollars, see IMF (2008) and BIS (2008).

fixed income portfolio away from its strategic weight, this will be offset by the rebalancing mechanism. This mechanism ensures that inflows of new capital to the Fund are channelled to the underperforming asset class, and – if necessary – that assets from the outperforming class are sold to purchase assets belonging to the underperforming class. Hence, this mechanism will move the actual portfolio weights over time towards the corresponding strategic weights. The composition of securities within the FIBM is, on the other hand, based on floating weights, largely reflecting the composition of the different segments of the global bond market. One can therefore think of the FIBM as being composed of different sub-categories of fixed income instruments with weights floating over time in tandem with market movements.

As figure 1 shows, the composition of the FIBM has been relatively stable in recent years, with around 50% invested in nominal government bonds (“Treasury”), 5% invested in index-linked bonds, and 45% in nominal non-government bonds (“Non-Treasury”).

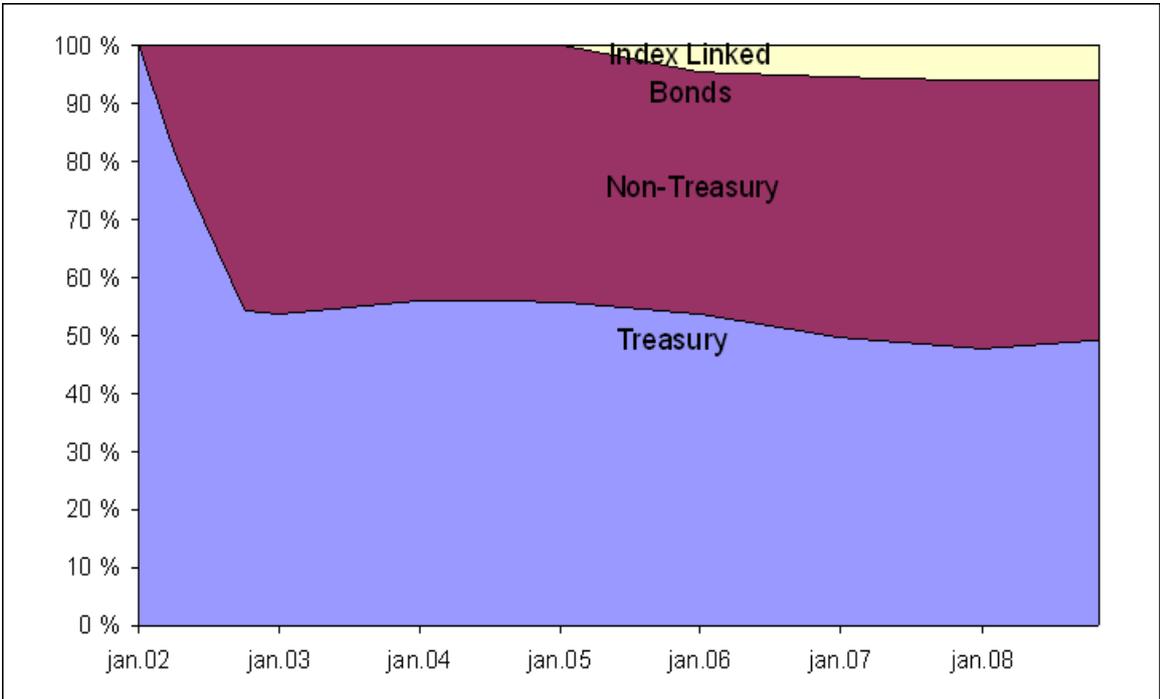


Figure 1 Composition of the fixed income benchmark 2002-2008¹

¹ In the category non-treasury bonds, government-related bonds (e.g. agencies such as Fannie Mae and Freddie Mac) account for 26%, securitized bonds for 32% and corporate bonds for 42% of this group.

Source: Barclays Capital

3 High yield bonds

The first key issue is to review whether one should continue to include only fixed income instruments with a high credit rating (investment grade) in the FIBM, or whether the benchmark portfolio should be extended to include also fixed income instruments with a credit rating below investment grade – also known as “high yield bonds”. More specifically, this term refers to the segment of the bond market comprised of debt securities rated BB+/Ba1 or lower by Standard & Poor’s and Moody’s Investor Service, respectively. High yield bonds are subject to a higher default probability than investment grade bonds, which is normally related to the debt issuer creating a high-risk financial structure (e.g. leveraged buyout), or deteriorating performance and increasing financial distress of the debt issuer (e.g. “fallen angels”).

The size and composition of the high yield segment of the global bond market are difficult to pinpoint due to lack of authoritative statistical sources. The size of the US and Canadian high yield market was estimated to be USD 1.1 trillion, equivalent to almost 2% of the global bond market, as of yearend 2007.² The European markets for high yield bonds are less developed than the North-American markets. As of January 2009, the market value of bonds included in the Barclays US high yield index amounted to USD 418 billion, including more than 1 400 constituents.³

There is a significant overlap of constituents in the current benchmark of US equities and the US high yield market. As of January 15, the FTSE All Cap index for the US held 2 238 constituents. Approximately 230 of these names were also included in the Barclays US High Yield index. The market value of the high yield bonds issued by the names already included in the FTSE index constituted 39% of the high yield index. Due to this overlap between the equity and high yield indices, including high yield in the Fund’s benchmark would include a larger share of the capital structure of these companies. Investing in bonds issued by companies in the equity portfolio of the Fund could be seen as equivalent to a deleveraging of the equity risk.

Table 1 displays stylized facts on the nature of risk related to investments in high yield and emerging market bonds.

Table 1 Overview of three segments of the bond market

	High yield	Emerging markets	
		International currency	Local currency
Nature of risk	Credit risk Liquidity risk	Credit risk Liquidity risk	Liquidity risk Currency /country risk Interest risk
Relation to other assets	High degree of cyclicity, positive return correlations with other assets	Moderate return correlations with other assets	
Tail risk	Skewness and kurtosis	Tail risk driven by issuer concentration and contagion	

High yield bonds carry a separate risk premium, capturing credit risk and liquidity risk. Conceptually, the credit spread on high yield bonds is the sum of a credit risk premium that compensates for the risk of default, and a liquidity premium reflecting the fact that high yield bonds are less liquid than investment grade bonds. The economic rationale for the inclusion of high yield bonds in an investment portfolio is that the credit risk premium more than compensates for expected future default losses.

Tail risk is a prominent feature of investments in high yield bonds. Thus, the return distribution is typically skewed and has fat tails (kurtosis). Considering the nature of risk related to high yield bonds, the Council would emphasize that reputational risk should also be taken into

² See Altman, E.I. and B.J. Kalin (2008).

³ Ford Motor was the largest issuer with a market value of USD 16 bn., or close to 4% of the index.

account when assessing whether to include high yield bonds in the FIBM. Reputational risk refers to the possibility that significant losses on specific fixed income investments, i.e. from defaults of large issuers, could hurt the reputation of Norway’s central bank or question the overall portfolio strategy of the Fund.

Past return data for various Barclays US aggregates are available from January 1985 to December 2009. Table 2 combines US indices from Barclays with data from the period 1953-1985 from Ibbotson Associates. The table shows that excess return in high yield (HY Corp) vs. 30d T-bills in the US has been marginally higher than in treasuries since 1953, and lower than in equities (S&P 500).

Table 2 Monthly excess returns in US aggregates vs. 30d T-Bills. 1953-2008

	S&P 500	HY Corp	IG Corp	Treasuries
<u>Monthly excess returns</u>				
Mean	0.50	0.13	0.10	0.12
Standard dev.	4.34	2.37	1.00	1.60
Skewness	-0.64	-1.06	0.07	0.32
Kurtosis	2.56	8.37	4.33	2.49
<u>Annualized excess returns</u>				
Sharpe ratio*	0.40	0.19	0.18	0.25
Arithm. mean	6.05	1.60	1.26	1.40
Geo. mean	5.09	1.28	1.03	1.26

* Sharpe-ratio, defined as: Mean/Std.dev.
Source: Johnsen and Liljebloom (2009).

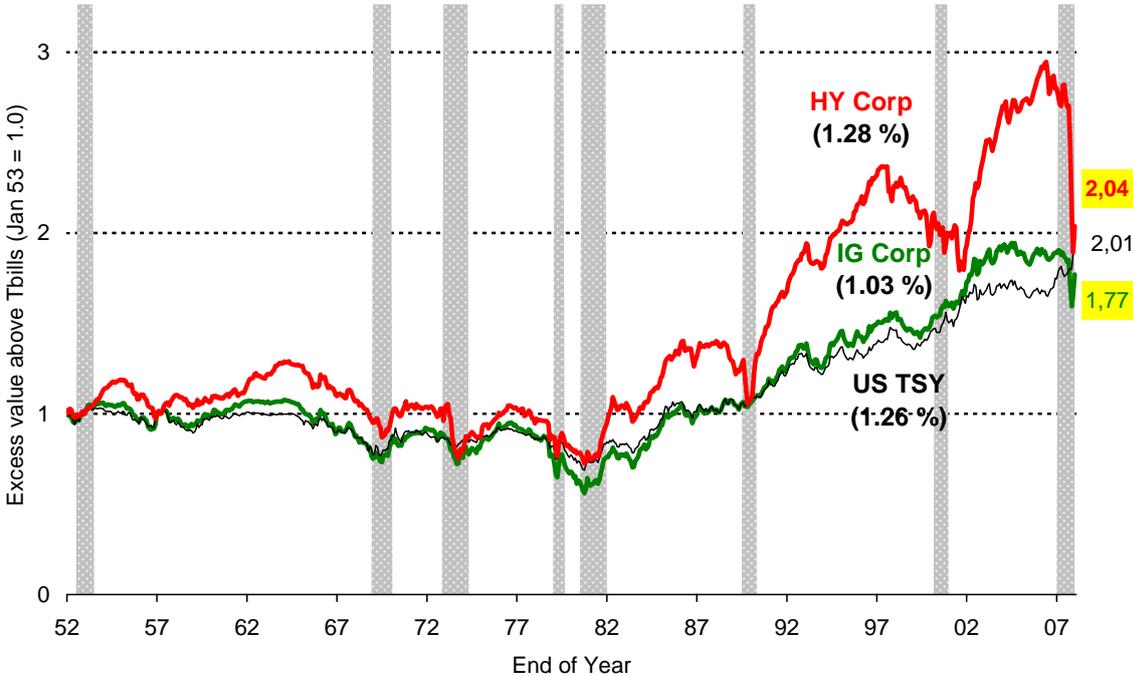


Figure 2 Accumulated excess returns vs. 30d T-Bills in the US bond market, 1953-2008
Source: Johnsen and Liljebloom (2009).

Figure 2 shows accumulated excess returns in different segments of the US bond market since 1953. Recessional periods are shaded. The figure illustrates the higher volatility in high yield bonds as well as the cyclical nature of the returns, compared to investment grade and treasuries.

Johnsen and Liljebloom (2009) study how risk premiums in various US markets compared to T-bills vary in different phases of the business cycle. They report positive excess returns in U.S. treasuries and investment grade bonds on average during a typical recessionary phase of past business cycles. High yield on the other hand has performed more like equities with negative average excess returns during recessions, and excess returns compared to T-bills, treasuries and investment grade in normal, expansionary phase of the cycles. See figure A.4 in the appendix.

Further analysis of return correlations for various pairs of US assets is also reported in the appendix. As expected, return correlations between treasuries and equities turn out to be fairly low. Hence, treasuries possess superior risk diversification properties for the Government Pension Fund - Global. High yield bonds have a substantial correlation vs. equities. As shown in the appendix, this correlation has in many cases increased during recessionary years. This suggests that compared to treasuries and investment grade, high yield bonds will tend to extend the Fund's losses during recessions and periods of financial distress.

The inclusion of high yield bonds in the Fund's fixed income benchmark would have only marginal effects on the Fund's total return and risk, however. This is due to the small size of these markets relative to the Fund's total benchmark, and to the fact that the expected risk, return and correlations are fairly close to the other assets of the benchmark. A less than perfect correlation between high yield bonds and the remainder of the portfolio suggests some minor diversification benefits in the long run.

4 Emerging market bonds

Emerging market *bonds* refer to bonds issued by national states (sovereign debt) or by other issuers from countries classified as emerging markets. The bonds may be issued either in international ("hard") currency or in local ("soft") currency. The term "emerging market" refers to a market that is in transition, increasing in size, activity or level of sophistication. A market is usually classified as emerging if it is located in a low- or middle-income economy or if its investable market capitalization is low relative to gross national income.

Emerging market bonds are already included in the FIBM insofar as the bonds are of investment grade credit quality and the bonds are denominated in international currency. Thus, the key issue is whether to include emerging market bonds denominated in local currency and bonds with below investment grade credit rating. This clearly relates to currency or country risk factors (cf. table 1 above).

The size of the segment of the global bond market comprised of emerging market bonds (in international and local currency) is estimated to just above USD 4½ trillion, or close to 8% of the global bond market. Here debt with remaining maturity less than one year is excluded. A considerable share of emerging market debt can be attributed to China, South Korea, Brazil, India and Mexico, accounting for 71% of all debt issued in emerging markets. Amounts outstanding of debt issued in local currency is on average close to 2½ times the value of debt issued in international currency, highlighting the importance of the "soft currency" segment of the bond market.

Past return data for the Barclays Emerging Market index (USD-denominated debt) is available from January 1993. Figure 4 illustrates accumulated returns for equities and various bond indices. Over the period January 1993 to December 2008, emerging market bonds have outperformed both equities and high yield bonds. Unfortunately, there is limited data availability on emerging market soft currency debt.

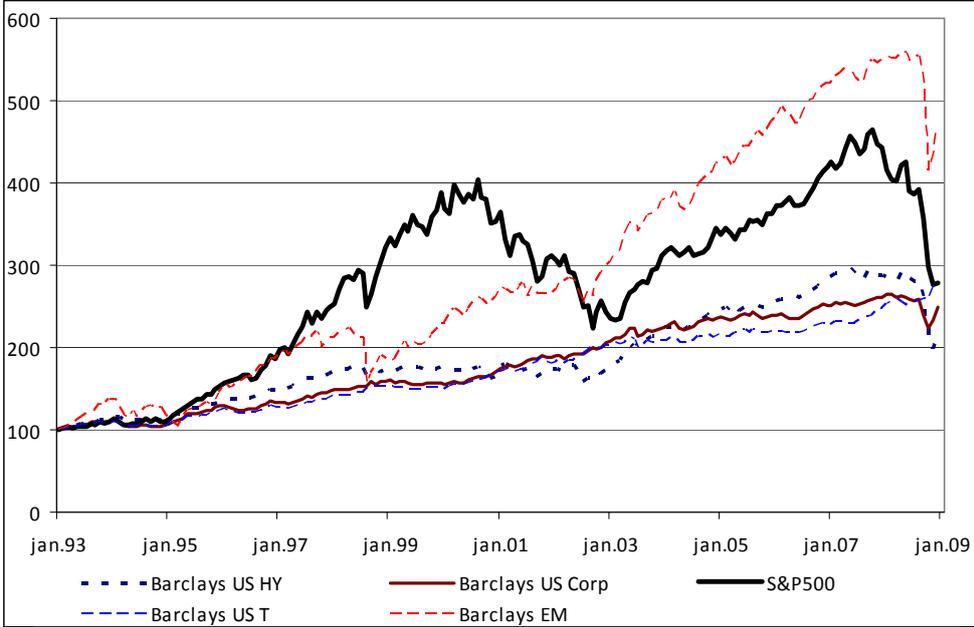


Figure 4 Accumulated returns for various assets 1993-2008.

Source: Barclays Capital and Ecwin.

5 Should the fixed income benchmark be split into two parts?

While the different categories of fixed income instruments discussed in section 2 share important similarities, they also differ significantly with respect to credit risk and liquidity risk. During the present financial turmoil, for example, liquid government bonds have performed well while equity and corporate bonds with credit risk clearly have not. Due to differences in risk characteristics within the fixed income asset class, it is natural to consider a split of the FIBM into two parts based on the degree of liquidity and credit risk – a fixed income government benchmark and a fixed income (non-government) credit benchmark – where the two parts are given fixed portfolio weights and appropriate rebalancing rules.

Separating the FIBM into two parts will most likely trigger more frequent rebalancing. It would therefore be necessary to take a closer look at the details of how the rebalancing regime should work. The Council has not had sufficient time to examine this issue. Based on the above recommendations regarding high yield corporate bonds and soft currency emerging market bonds, however, the need for a separation of the fixed income portfolio is less urgent. The Council recommends that further analysis of portfolio weights and of the rebalancing mechanism should be carried out before a decision is made in regard to splitting the FIBM.

6 Conclusion

In principle, broadening the Fund’s fixed income benchmark by including high yield bonds and more risky emerging markets bonds can be seen as consistent with the Fund’s trend towards increased diversification. Including such new asset classes in the benchmark would also be a mechanism for the Fund to harvest liquidity premiums, consistent with the Ministry’s

deliberations on the future development of the investment strategy in the annual white paper in the spring of 2008.

Historical data show that high yield bonds have performed more like equities with negative average excess returns during a recession, and excess returns compared to treasuries and other less risky fixed income instruments in normal, expansionary phase of the cycles. Hence, treasuries possess superior risk diversification properties for the Government Pension Fund - Global. Considering also the reputational risks, the Council does not recommend including high yield bonds in the Fund's fixed income benchmark.

The Council notes that there is limited data available to analyze historical performance of fixed income securities issued in emerging markets in local currency. Furthermore, including emerging market bonds would raise important operational challenges. Therefore, the Council does not recommend including such bonds now. As more information on emerging market bonds becomes available in the future, this issue should be re-examined.

The third issue concerns whether one should separate the fixed income benchmark in two parts based on the degree of liquidity and credit risk; a fixed income government benchmark and a fixed income credit benchmark with fixed weights. Such a separation would recognize that the two parts of the fixed income benchmark have different return, risk and correlation characteristics. Based on the above recommendations regarding high yield corporate bonds and soft currency emerging market bonds, the need for a separation of the fixed income portfolio is less urgent. The Council recommends further analysis of portfolio weights and of the rebalancing mechanism before a decision is made.

Oslo, March 20, 2009

Erling Steigum (Chairman)
Bodil Nyboe Andersen
Elroy Dimson
Ida Helliesen
Thore Johnsen
Eva Liljeblom

Appendix

Background

In the regulations relating to the Government Pension Fund – Global, an important distinction is made between eligible markets (the investment universe) and markets that are included in the Fund’s benchmark. The benchmark may be interpreted as an indication of where the Fund *shall* be invested unless Norges Bank wishes to draw on the risk allowance it has been allocated for deviations from the benchmark. Eligible markets include those markets in which the Fund *may* be invested.

The current FIBM includes bonds issued in hard currency from a large number of emerging market countries (with investment grade rating), albeit their aggregate exposure in the benchmark is relatively small. This part of the fixed benchmark is dominated by sovereigns issuing debt in either *US dollar* or *euro*.

Since 2006, the set of eligible markets for bonds has been larger than the set of markets included in the FIBM. The expansion of the investment universe in 2006 included abolition of the minimum rating criteria for bonds and the interval for the duration of the fixed income portfolio. Furthermore, authority was granted to undertake investments in high yield bonds. Subsequently, the universe for investing in emerging bond markets has also been expanded. In 2007, the earlier list of eligible markets was abolished. Since then, new markets and currencies have been approved according to internal guidelines on the part of Norges Bank, based on overarching stipulations from the Ministry of Finance concerning valuation, return measurement, and the management and control of risk. As of January 2009, Norges Bank has approved investments in 11 currencies that are not included in the FIBM.

Several index providers have developed indices for high yield bonds and emerging market bonds, including Barclays (ex-Lehman), JP Morgan, Credit Suisse and Merrill Lynch. There is, however, variation between the index providers as concern inclusion criteria, date of inception of the index, and coverage of the market. Barclays and Merrill Lynch appear to have highest coverage for high yield bonds, while JP Morgan is the leading index provider for emerging markets.

The Fund’s current index provider for the FIBM, Barclays, has developed global indices for the high yield market and for emerging market bonds denominated in international and local currency (the latter as of June 2008). Typically, the global indices are composed of different sub-indices based on geographical regions or specific markets. Barclays has a set of rules for including or excluding new bonds in or from its benchmark. Bonds that are not included in the benchmark are either too small, have very low liquidity, or they fail to qualify due to assessments pertaining to more qualitative risk factors.

In what follows, we first look at the empirical sources and patterns of high yield spreads and return correlations with other securities, including emerging market bonds. Then follows a peer group comparison of investment in high yield and emerging market bonds among the 19 largest institutional investors. Finally, some operational issues are discussed.

The nature of risk

Historical data shows that the risk premium on high yield investments is highly correlated with business cycles (profit cycles). Thus, credit spreads tend to rise in economic downturns and fall during upturns, reflecting developments in actual and expected default rates, cf. Figures A.1

and A.2. Consequently, total return from investments in high yield bonds depends on credit spreads, defaults and loss given default (non-recovery). Default rates are typically inversely related to the growth rate of the economy, while recovery rates are positively correlated with growth rates, cf. Figure A.2.

Tail risk is a prominent feature of investments in high yield and emerging market bonds; see table 1 in this letter. Thus, the return distribution related to high yield investments is typically skewed (asymmetric) and has kurtosis (fat tails). The tail risk associated with investments in emerging market bonds is more driven by issuer concentration and contagion.

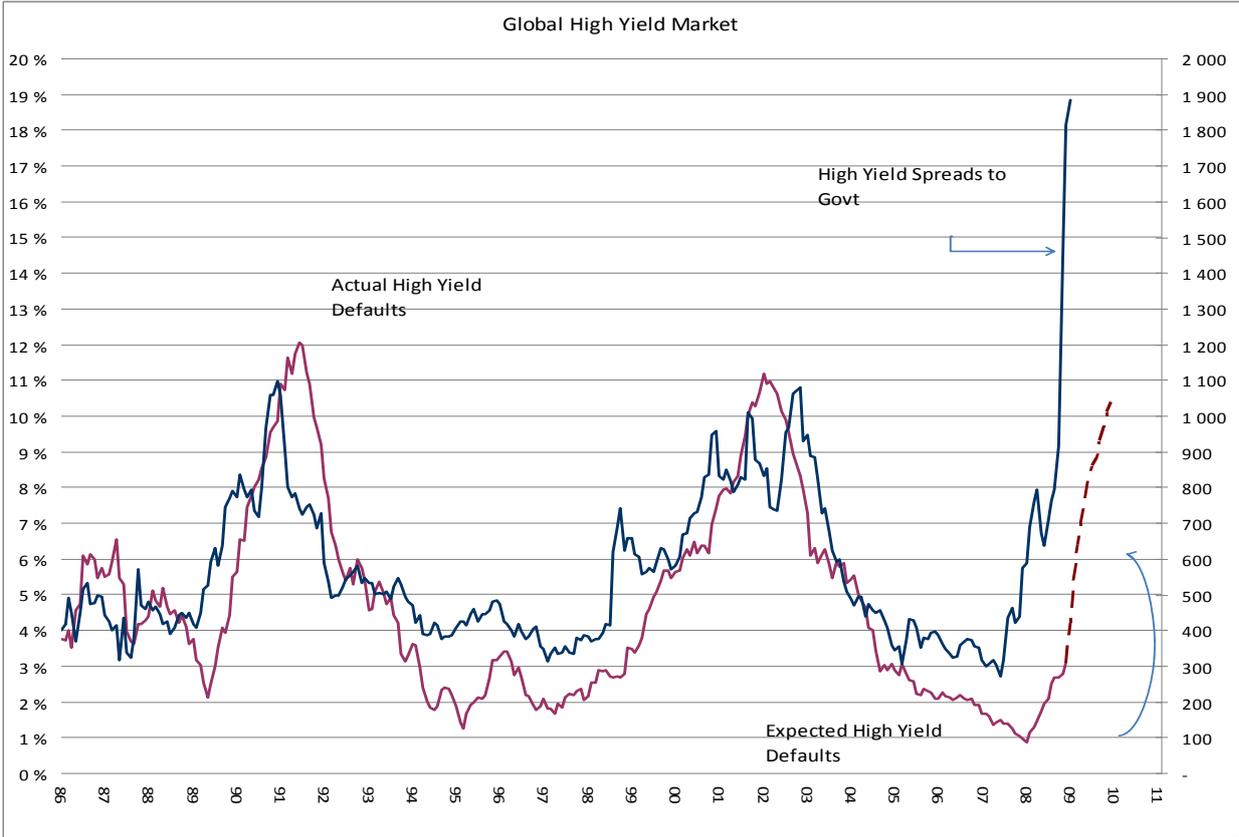


Figure A.1 Credit spreads and default rates for the global high yield market 1986-2008
 Source: Credit Suisse, Moody’s and Carnegie (2008)

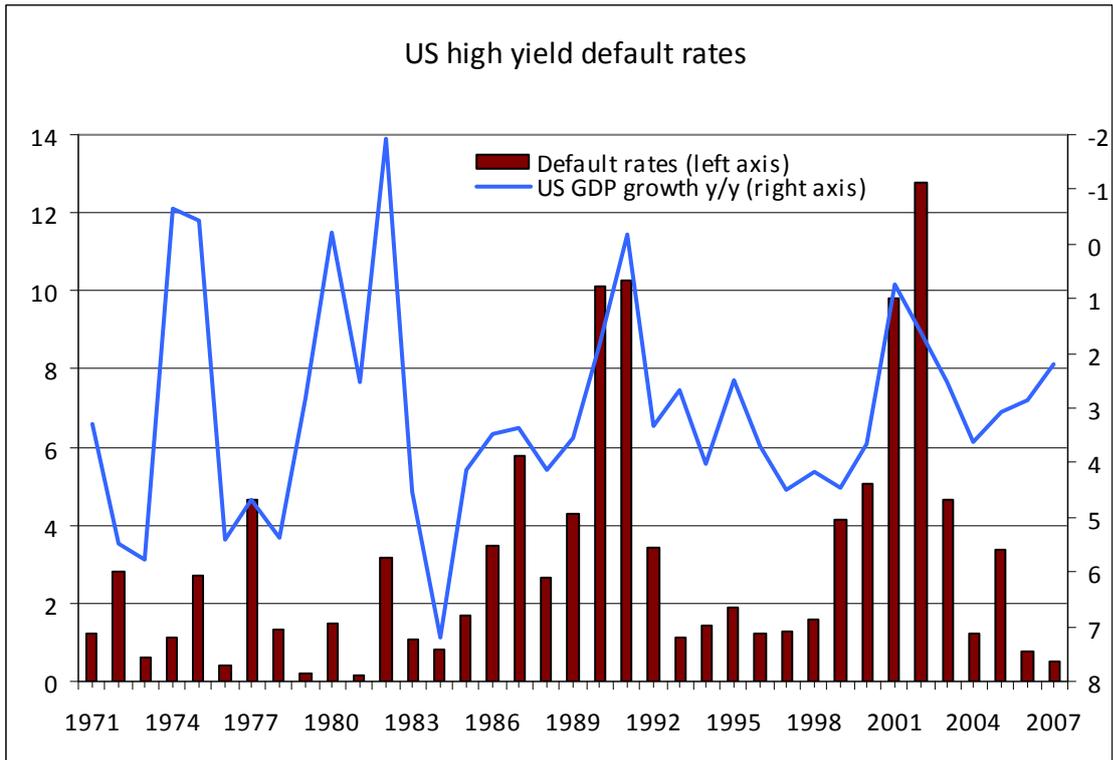


Figure A.2A Default rates for the US high yield market 1971-2008
 Source: Altman and Karlin (2008) and Ecwin

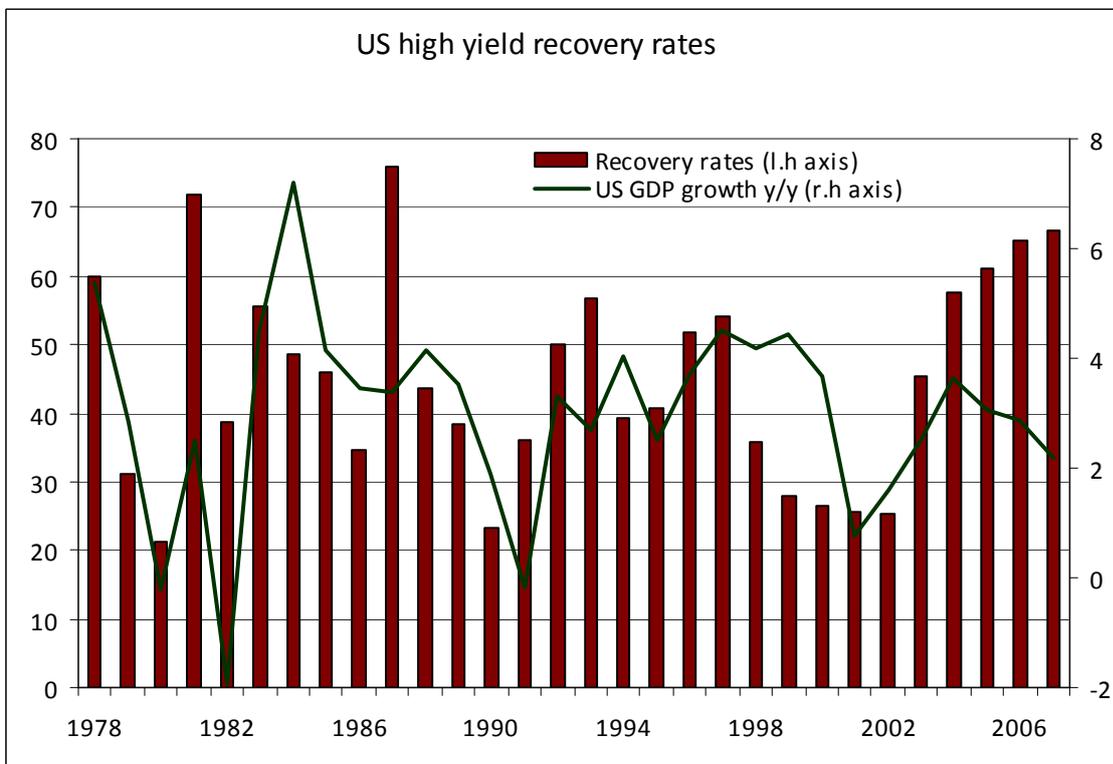


Figure A.2B Recovery rates for the US high yield market 1978-2008
 Source: Altman and Karlin (2008) and Ecwin

Johnsen and Liljebloom (2009) show that high yield bond returns were more skewed than investment grade bond returns during the 1953-2008 period, cf. table 2.

Figure A.3 shows ten year rolling return correlations in the period 1953-2008 for various pairs of US assets. Panel A illustrates that the correlation between high yield and equities has usually been around 0.5. The correlation between high yield bonds and treasuries has been more volatile, and it has declined substantially during the last 20-25 years. Panel B illustrates that the rolling return correlations have declined towards zero. Hence, treasuries possess superior risk diversification characteristics for the Fund. High yield bonds exhibit a high and in many cases increasing correlation vs. equities during recessions. Compared to treasuries and investment grade, high yield bonds will tend to extend the Fund’s losses during recessions and periods of financial distress.

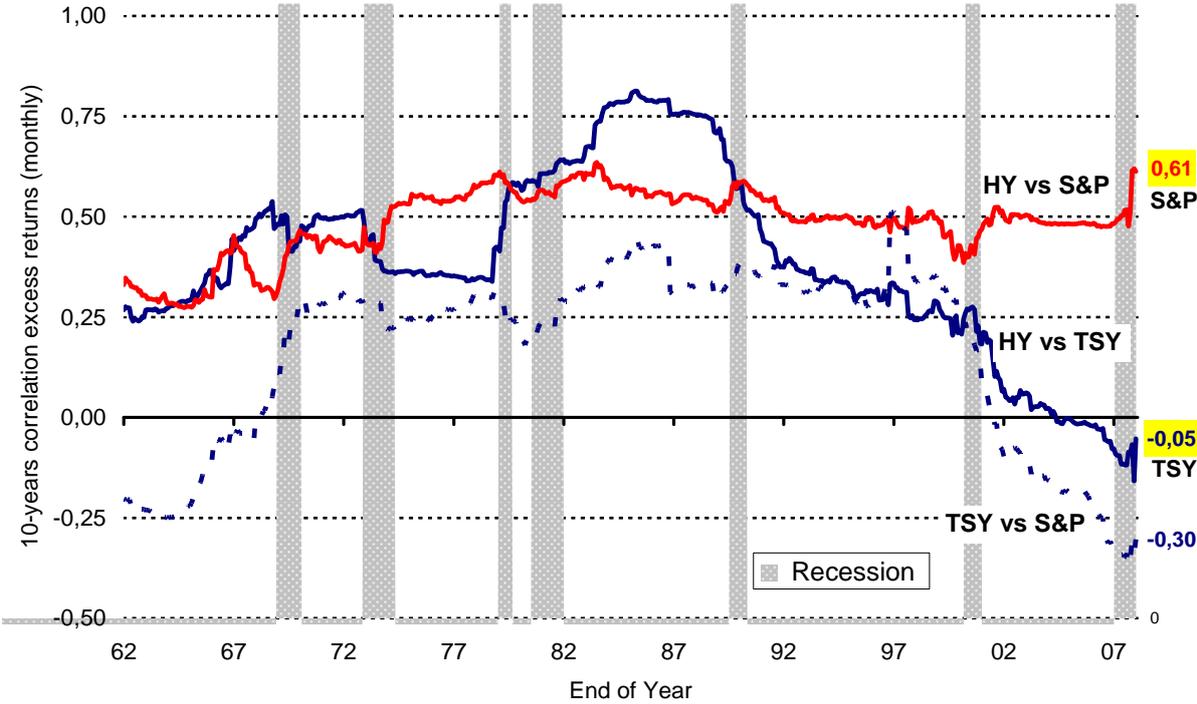


Figure A.3A Ten year rolling return correlations vs. high yield bonds.
 Source: Johnsen and Liljebloom (2009)

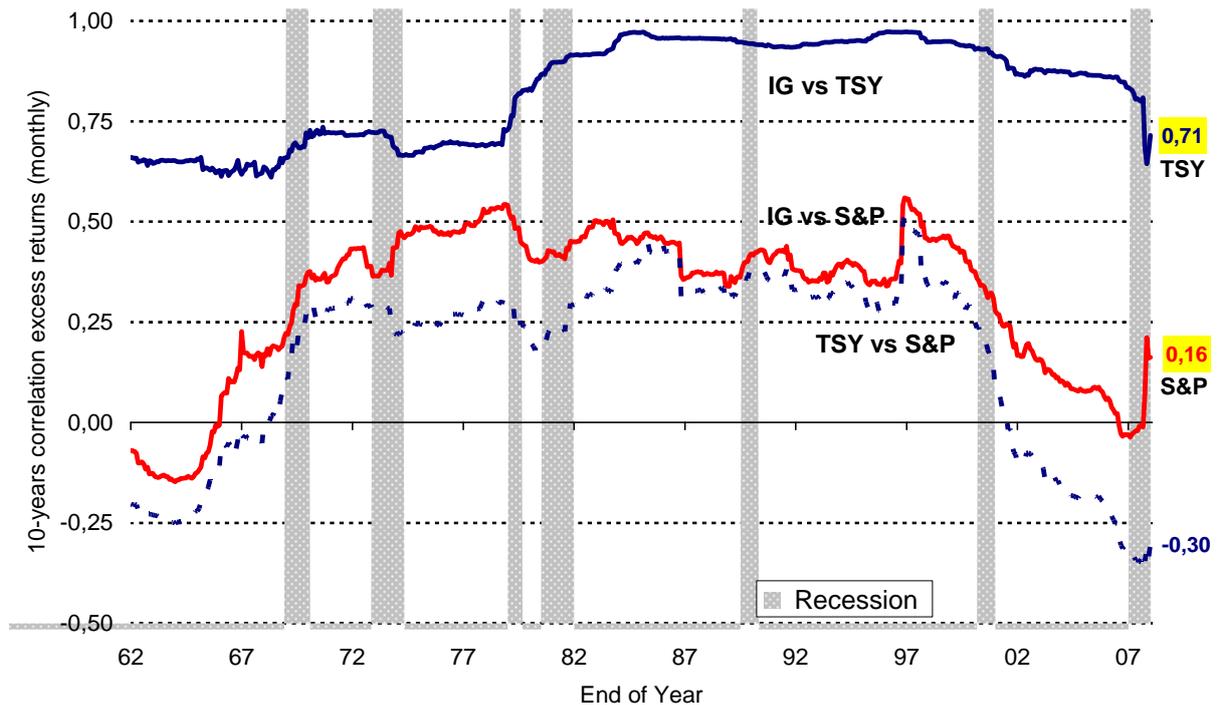


Figure A.3B Ten year rolling return correlations vs. investment grade bonds.
 Source: Johnsen and Liljebloom (2009)

The cyclicity in high yield returns is also evident from an analysis of risk premiums vs. T-bills. Figure A.4 shows average annualized risk premiums in different stages of a representative US business cycle in the period 1953-2008.⁴ While both treasuries and investment grade bonds have positive excess returns during the average recessionary period from peak to through, high yield bonds perform more like equities with significant negative excess returns.

⁴ NBER has identified a total of 11 recessionary (peak-to-trough) and expansionary periods (trough-to-peak) during this period, with average length respectively 11 and 58 months. The monthly return data has been sorted into 6 cycle time buckets: the turning points each containing 5 months (peak and trough month +/- 2 months), the recessionary period containing the intermediate 7 months on average, and the expansionary period divided into three equal sub-periods of on average 18 months each. Note that the different time buckets have different lengths.

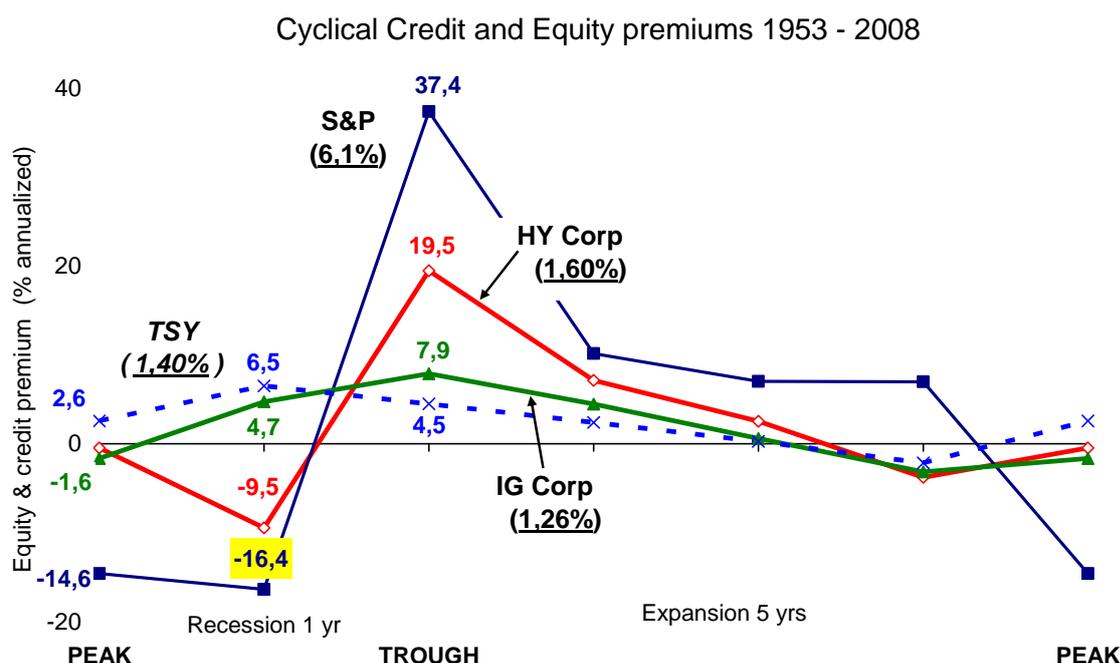


Figure A.4 Cyclical Credit and Equity premiums 1953-2008
 Source: Johnsen and Liljebloom (2009)

Historical correlations

Past return data for various Barclays US aggregates are available from January 1985 – December 2008. Johnsen and Liljebloom (2009) have combined indices from Barclays with data from 1953-1985 from Ibbotson Associates. Return data for the Emerging Market index (USD-denominated debt) is only available from January 1993. There is limited data availability on emerging market soft currency debt.

The correlations between the total rate of return on investments in high yield and emerging market bonds and other assets classes suggest that there could be potential diversification benefits in the long run from including high yield and emerging market debt in the Fund's benchmark portfolio, see Table A.1.

Table A.1 Correlations between high yield bonds, emerging market debt and other asset classes. Excess returns vs. 30d T-Bills

	US high yield	US corporate	S&P 500	Barclays US treasuries	Barclays Emerging Markets
<i>1953-2008</i>					
US high yield	1.00				
US corporate	0.61	1.00			
S&P 500	0.53	0.31	1.00		
US treasuries	0.35	0.81	0.12	1.00	
<i>1993-2008</i>					
Barclays US high yield	1.00				
Barclays US corporate	0.50	1.00			
S&P 500	0.56	0.22	1.00		
Barclays US treasuries	0.03	0.79	-0.12	1.00	
Barclays Emerging Markets	0.52	0.37	0.53	0.12	1.00

Source: Barclays Capital, Ecwin and Johnsen and Liljebloom (2009).

For high yield bonds there is an apparent tendency of segmentation as concern credit returns. In particular, the risk-adjusted return is higher for bonds rated BB and B than for other segments, see Table A.2. This anomaly may be due to the fact that many investors cannot hold securities below investment grade, implying that a downgrade of a Baa rated bond to Ba or B may lead to a sell off. Other investors may seek to take advantage of this sell off by requiring a larger risk premium.

Table A.2. Risk and return for various US segments

1988/9-2008/8	Aaa Corp	AA Corp	A Corp	Baa Corp	HY Ba	HY B	HY Caa
Average OAS 94-08	0.69	0.76	1.03	1.54	1.97	4.71	8.96
Average excess return vs. Treasuries	-0.01	-0.03	-0.20	-0.19	1.41	0.81	-0.26
Std.dev. excess return	1.26	1.64	2.20	3.09	5.85	8.32	13.41
Sharpe ratio	-0.01	-0.02	-0.09	-0.06	0.24	0.10	-0.02
Sharpe ratio until 2007/3	0.25	0.34	0.20	0.13	0.38	0.20	0.06

Source: Ilmanen (2008).

Peer group allocations

The company Cost Effectiveness Measurement (CEM) has constructed a peer group for the Government Pension Fund – Global consisting of the 19 largest international institutional investors to facilitate peer group comparisons, based on an agreement with the Ministry of Finance. The majority is US based, and with two funds from Canada, two from the Netherlands in addition to the Government Pension Fund – Global.

In this peer group, 14 of the sponsors reported benchmark allocations to high yield bonds and 9 of the sponsors had allocations to emerging market bonds.⁵ In the group investing in high yield

⁵ The data which are collected by CEM do not allow for a separation of the allocations to emerging market bonds in hard and soft currency, respectively.

allocations, these investments constituted on average 5.6% of the fixed income portfolio (with the highest being 17.2%). In the group that had allocations to emerging market bonds, these investments constituted on average 2.7% of the fixed income portfolio (with the highest being 4.9%).

Operational issues

High yield and emerging market bonds are formally in the investment universe set by the Ministry, provided that the relevant markets, currencies and instruments have been approved according to Norges Bank's internal guidelines. While the Fund today may have investments in high yield and emerging market bonds that are not in the current benchmark, it is fair to assume that such investments would increase were these asset classes to be included in the benchmark. And since these asset classes differ in some key respects from the existing asset classes in the benchmark, one would also need to pay due attention to the operational challenges before high yield and emerging market bonds were included in the benchmark.

For high yield bonds, it should be relatively straightforward to select a relevant benchmark index. Since this segment is largely an extension of the US market for corporate bonds, of which investment grade is already in the benchmark, one would not envisage significant operational challenges related to legal framework, regulation or settlement systems.

Since high yield is an illiquid asset class, and thus presumably could command a liquidity premium, it would be more challenging to develop and maintain an index exposure. The owner would have to accept larger deviations from the index than in more liquid markets. The returns from the asset class also exhibit signs of non-normality. Therefore, the owner would be well served by having in place robust governance and risk management systems. Risk management systems to handle credit risk would be different from risk management systems designed for liquid equities and low-risk bonds. Introduction of caps to limit issuer concentration is not uncommon among high yield investors. Finally, the higher yield on such bonds is associated with a higher risk of default, which means that the investment organization would need to be able to handle a larger numbers of defaults.

For emerging market bonds in hard currency (and a credit rating below investment grade), many of the same considerations apply.

In regard to emerging market bonds in local currency, one would in addition need to take into account legal frameworks, regulation and settlement systems in the relevant jurisdictions. In some countries, restrictions on capital flows may also be an issue.

References

Altman, E.I. and B.J. Kalin (2008), “Defaults and Returns in the High-Yield Bond Market: The Year 2007 in Review and Outlook”, *mimeo*, New York University Salomon Centre, Leonard N. Stern School of Business.

Barclays Capital (2008), Empirical Analysis of High Yield Bond Market Returns. Quantitative Portfolio Strategy. An analysis prepared for the Ministry of Finance.

BIS (2008), Quarterly Review, September 2008.

Ilmanen (2008), “Lessons from the 2007-08 Financial Crisis”. Presentation for the Ministry of Finance.

IMF (2008), Global Financial Stability Report, October.

Johnsen, T. and E. Liljeblom (2009), “High Yield Corporate Bonds”, *forthcoming*.