MEMORANDUM

To: File S7-24-15, Use of Derivatives by Registered Investment Companies and Business Development Companies

From: The Division of Economic and Risk Analysis[1]

Date: November 1, 2016

Re: Risk Adjustment and Haircut Schedules

Many commenters on proposed rule 18f-4 suggested that the rule should measure a fund's derivatives exposure using notional amounts adjusted to reflect the risks of the underlying reference assets. These commenters suggested that the Commission adopt risk-based adjustments derived from standardized schedules used for other regulatory purposes. Many commenters also suggested that a fund be permitted to maintain as qualifying coverage assets a range of assets in addition to cash and cash equivalents, subject to "haircuts" to the value of these additional assets identified in standardized schedules included in other regulatory requirements. In light of these comments, DERA staff analyzed the regulatory requirements most frequently identified by commenters.

This memorandum sets out the methods by which DERA staff performed its analysis and the results thereof. The Commission has expressed no view regarding any specific risk-based adjustments, or our analysis or its results.

1. Summary of Existing Schedules on Margin Requirements

First, we summarize the standardized schedules most frequently identified by commenters and which commenters suggested could be used to derive risk-based adjustments to notional amounts for purposes of rule 18f-4[2]: the schedules used in the final rules for margin requirements for uncleared swaps adopted by the prudential regulators and the Commodity Futures Trading Commission (PR and CFTC, respectively).[3] These schedules are consistent with the schedule

[1] This is a memo by the Staff of the Division of Economic and Risk Analysis of the U.S. Securities and Exchange Commission. The Commission has expressed no view regarding the analysis, findings or conclusions contained herein.

[2] *See, e.g.*, Comment Letter of the Investment Company Institute (July 28, 2016), *available at* https://www.sec.gov/comments/s7-24-15/s72415-244.pdf ("ICI July 28, 2016 Comment Letter") (proposing a schedule based on the PR/CFTC schedule) ; Comment Letter of the Investment Adviser Association (Aug. 18, 2016), *available at* https://www.sec.gov/comments/s7-24-15/s72415-250.pdf (while opposing portfolio limitations entirely, supporting the PR/CFTC-based schedule provided by the ICI); Comment Letter of James A. Overdahl, Delta Strategy Group (Mar. 24, 2016), *available at* https://www.sec.gov/comments/s7-24-15/s72415-85.pdf (suggesting the PR schedule as one possibility).

[3] Margin and Capital Requirements for Covered Swap Entities, 80 FR 74839 (Nov. 30, 2015), *available at* https://federalregister.gov/a/2015-28671; Margin Requirements for Uncleared Swaps for Swap Dealers and Major Swap Participants, 81 FR 635 (Jan. 6, 2016), *available at* https://federalregister.gov/a/2015-32320.

for the margin requirements for non-centrally cleared derivatives published by the Bank for International Settlements (BIS), which some commenters also suggested could form a basis for adjustments to notional amounts for purposes of rule 18f-4, and so we analyze all three schedules (collectively, the "regulatory schedules") together.[4]

These sources generally provide standard margin schedules organized by reference asset class, including the asset classes most frequently discussed by commenters.[5]

Table 1. Summary of PR/CFTC/BIS Schedules

Asset Class	*Initial Margin Requirement*[a]
Credit: 0–2y duration	2%
Credit: 2–5y duration	5%
Credit 5+y duration	10%
Commodity	15%
Equity	15%
Foreign exchange	6%
Interest rate: 0–2y duration	1%
Interest rate: 2–5y duration	2%
Interest rate: 5+y duration	4%

[a] Expressed as % of notional exposure

As depicted in Table 1, the initial margin schedules set by the PR, CFTC, and BIS are identical for all reference asset classes analyzed.

[4] Basel Committee on Banking Supervision, Board of the International Organization of Securities Commissions (Mar. 2015), *available at* http://www.bis.org/publ/bcbs261.pdf; *see, e.g.*, Comment Letter of the Securities Industry and Financial Market Association (Mar. 28, 2016), *available at* https://www.sec.gov/comments/s7-24-15/s72415-174.pdf (primarily supporting BIS schedule).

[5] We do not analyze specific types of derivatives transactions, and thus do not analyze cross currency swaps, which are included in the PR/CFTC schedules but are not included in the BIS schedule.

2. Risk Analyses and Comparisons

To evaluate commenters' suggestions regarding these standardized schedules, we assess how they relate to the risks of the underlying reference assets. We use the PR and CFTC schedules, and the BIS schedule, as the main reference point because they were most frequently identified by commenters and provide identical values for all of the asset classes analyzed below.[6]

2.1. U.S. Treasury Securities

Commenters suggested two different means of risk-adjusting the notional values for interest rate derivatives. These are discussed below.

2.1.1. Risk Comparisons of the Existing Schedules

Because the regulatory schedules provide that the highest amount of initial margin applies to equity derivatives, the volatility of large capitalization equity securities can be used as a baseline against which to compare the other asset classes in the schedule.[7] To evaluate the suggested risk adjustments for interest rate ("IR") derivatives, we first determine the relative risk of U.S. Treasury securities as compared to domestic large capitalization equity securities. We compute risk levels (*i.e.*, monthly standard deviations) using monthly total returns of the S&P 500 and the Barclays Treasury Series from January 1997 to July 2016, for which we have data available.[8] We then divide the standard deviation of the U.S. Treasury securities by the standard deviation of the S&P 500 to compute the risk ratios. Table 2 summarizes the results.

[6] The risk analyses performed here are based on indexes rather than individual securities. We believe that the analyses should generally capture the relative risk across various asset classes.

[7] The initial margin requirements in the regulatory schedules are expressed as a percentage of notional amounts, which are subject to additional calculations to determine initial margin amounts to be collected under the applicable regulatory margin requirements. The regulatory schedules provide that the highest amount of initial margin also must be collected for commodity derivatives. A comparison of S&P 500 and two commonly used commodity indexes (the Bloomberg and the S&P GSCI commodity indexes) indicates that commodities have a similar or somewhat higher risk level as compared to equity securities.

[8] To understand whether the risk ratios we calculated would be materially different under different sets of market conditions, including during periods of financial stress, we perform these analyses using data from 2008-2010. We obtain similar findings, which are provided in the appendix. Data for the S&P 500 are obtained from Morningstar. Data for all Treasury and corporate bond series are obtained from Datastream.

Table 2. Risk Analyses for U.S. Treasury vs Equity Securities

	(1)	*(2)*	*(3)*	*(4)*
Asset Class	*Risk Level (standard deviation of historical returns)*	*Initial Margin Requirement under PR/ CFTC/BIS schedules*	*Risk Ratio implied by PR/CFTC/BIS schedules*[a]	*Risk Ratio computed relative to Equity risk level*
Equity	4.45	15%	100%	100%
Treasury IR: 0–2y	0.27[b]	1%	7%	6%
Treasury IR: 2–5y	0.62[c]	2%	13%	14%
Treasury IR: 5+y	2.48[d]	4%	27%	56%

[a] Computed as the initial margin requirement of an asset class divided by the initial margin requirement of equity (15%)
[b] Computed using interest rate of Treasury 0-3 months and 1-2 years
[c] Computed using interest rate of Treasury 1-5 years
[d] Computed using interest rate of Treasury 5-10, 10-20, and 20+ years

Historical risk levels and risk ratios implied by the PR, CFTC, and BIS schedules for equity (S&P 500 as proxy) and various Treasury securities are reported in Columns 1 and 2 of Table 2. The implied risk ratio from the existing regulatory schedules (initial margin of an asset class divided by initial margin requirement for equity) is reported in Column 3. Commenters suggested that these implied risk ratios can be used as the multipliers to calculate risk-adjusted notional amounts for purposes of rule 18f-4.[9] Column 4 reports realized risk ratios calculated by the ratio between the historical volatility of the Treasury series and the historical volatility of the S&P 500.

Comparing columns 3 and 4, we observe that for short-term Treasury securities (2 years or less), the margin schedules are roughly consistent with the underlying risk levels of the reference assets. We compute a risk ratio of 6%, as compared to the 7% implied from the PR, CFTC, and BIS schedules.

For medium-term U.S. Treasury securities, the ratios are also consistent, although due to data availability our series is for 1 to 5 years, rather than 2 to 5 years as in the regulatory schedules.[10,11]

[9] *See supra* footnotes 2 & 4.

[10] Please also note that BIS and CFTC schedules classify interest rate derivatives using duration rather than maturity. For most U.S. Treasury securities (up to 10 years), durations are fairly close to actual maturities (*e.g.*, for 1 year U.S. Treasury securities, duration is 0.96; for 5 year U.S. Treasury securities, duration is 4.85). Therefore, using maturity as a substitute for duration in this analysis will have a minimal impact on our comparisons using maturity-based series.

For long-term U.S. Treasury securities with maturities exceeding 5 years, our analyses indicate a higher calculated risk ratio (56%) versus what is implied by the PR, CFTC, and BIS schedules (27%). We note, however, that if long-term U.S. Treasury securities refer to those with mainly 5 to 10 year maturities, our risk analyses yield a risk ratio of 36%, which is closer to these schedules.

2.1.2. Reference Bond

Commenters suggested in the alternative that rule 18f-4 should permit funds to adjust the amount of interest rate derivatives by normalizing them to a specified reference bond. Some commenters suggested that the 10-year Treasury bond would be an appropriate reference bond, whereas others suggested the appropriate reference bond would be the 30-year Treasury bond because these commenters asserted that the 30-year Treasury bond has a level of volatility roughly comparable to that of equity markets.[12]

Using data from 1980 to 2016, we compute the risk levels of these asset classes and find that this methodology suggests that the relative risk level for the 30-year Treasury bond is 86% of the S&P 500, while the relative risk level for the 10-year Treasury bond is 55%.

Table 3. 10-year vs 30-year Treasury Bond Risk

	S&P500	*30-year Treasury*	*10-year Treasury*
Risk (std. dev.)	4.35	3.74	2.38
Risk Ratio	1	0.86	0.55

2.2. Credit Derivatives

Credit derivatives can be exposed to either both default risk and interest rate risk or to predominantly default risk. We first evaluate commenters' suggested adjustments for credit derivatives based on regulatory schedules by analyzing how the risk of corporate debt compares to the risk of equity. Then, we investigate credit derivatives that predominantly are exposed to default risk by comparing the risk of credit default swaps ("CDS") relative to the risk of equity.

[11] For the consistency of the analyses, we used U.S. Treasury series from Barclays obtained from Datastream. This data source is only available in a 1 to 5 year series, and a 2 to 5 year series cannot be separately derived from it.

[12] *See, e.g.* Comment Letter of Guggenheim Investments, *available at* https://www.sec.gov/comments/s7-24-15/s72415-163.pdf; Comment Letter of Pacific Investment Management Company LLC, *available at* https://www.sec.gov/comments/s7-24-15/s72415-168.pdf ("PIMCO Comment Letter"); Comment Letter of Capital Research and Management Company, *available at* https://www.sec.gov/comments/s7-24-15/s72415-153.pdf.

2.2.1. Corporate Debt

Table 4 reports risk levels using total returns of the S&P 500 and the indexes of the AAA- and BBB- rated bonds from 2004 to 2016, the period for which we have data available.

Table 4. Risk Analyses for Corporate Debt vs Equity

	(1)	*(2)*	*(3)*	*(4)*
Asset Class	*Risk Level (standard deviation of historical returns)*	*Initial Margin Requirement under PR/CFTC/BIS schedules*	*Risk Ratio implied by PR/CFTC/BIS schedules*	*Risk Ratio computed relative to Equity risk level*
Equity	4.09	15%	100%	100%
Credit: 0–2y duration	0.70[a]	2%	13%	17%
Credit: 2–5y duration	1.33[b]	5%	33%	33%
Credit 5+y duration	2.46[c]	10%	67%	60%

[a] Computed using AAA and BBB 1-3 years
[b] Computed using AAA and BBB 3-5 years and 5-7 years
[c] Computed using AAA and BBB 7-10, 10-15 and 15+ years

The implied risk ratios are, again, computed as the initial margin requirement for an asset class divided by the initial margin requirement for equity. Comparing columns 3 and 4, we observe that the implied risk adjustment ratios and the ratios we computed from the risk analyses are generally consistent for all three maturity categories.[13] For the short-term credit category, our analyses indicate that the PR, CFTC, and BIS schedules have an implied risk ratio that is slightly lower than the risk ratio computed, while for the long-term category, the risk ratio implied from the schedules is slightly higher. To evaluate a comment regarding adjusting risk on a continuum rather than by bucketing instruments together,[14] we note that dividing duration by 10 times 100% results in a continuum of risk ratios that is generally consistent with the risk adjustments in the regulatory schedules.[15]

[13] The maturities used in our risk analyses are slightly higher in order to provide for a comparable comparison between the values included in the regulatory schedules, which are determined on the basis of duration, and the values used in our analyses, which are based on the relevant securities' maturities.

[14] PIMCO Comment Letter (noting that a duration adjustment to a specified reference bond adjusts risk on a continuum rather than bucketing instruments with different risk characteristics together).

[15] For durations between 0.25 years and 2 years, between 2 years and 5 years, and between 5 years and 10 years, the adjusted risk ratios are between 2.5% and 20%, between 20% and 50%, and between 50% and 100%, respectively.

2.2.2. Credit Default Swaps

To evaluate the risk of CDS we compute standard deviations of CDS returns.[16] Table 5 reports the risk levels of returns of the CDX CDS index obtained from Capital IQ Inc. and those of total returns of the S&P 500 index. The data cover the period from 2008 to 2014, for which the CDS data is available.[17]

The table shows that returns for CDS contracts referencing high yield corporate debt are more volatile than those for CDS referencing investment grade corporate debt.[18] The CDS contracts that exhibit the highest risk level are those for high yield CDS with a tenor of 10 years. [19] The returns to these CDS have a standard deviation of 1.16 % per month and their risk ratio relative to equities is 24%.

Table 5. Risk Analyses for CDS vs Equity

		(1)	*(2)*
Asset Class		*Risk Level (standard deviation of historical returns)*	*Risk Ratio computed relative to Equity risk level*
Equity (S&P 500)		4.86	100%
CDS, investment grade	1y tenor	0.02	0%
	5y tenor	0.18	4%
	10y tenor	0.31	6%
CDS, high yield	1y tenor	0.29	6%
	5y tenor	0.84	17%
	10y tenor	1.16	24%

[16] Standard deviations are computed from daily data and scaled to monthly frequency using the square root of the average number of daily observations per month during the sample.

[17] CDS returns are computed as -Δ(CDS Spread)×PV01, where PV01 is the change in the value of the CDS contract, relative to the notional amount of the CDS, for a one percentage point increase in the CDS spread.

[18] In this table, we are not reproducing the initial margin requirements under the PR/CFTC/BIS schedules and the risk ratios implied by PR/CFTC/BIS schedules because the schedules do not distinguish between investment grade and high-yield corporate debt.

[19] In recommending how funds would use the PR/CFTC schedule, one commenter distinguished the way that funds should calculate the risk adjustment for credit default swaps from the calculation for other credit derivatives, suggesting that for credit default swaps, funds use the maturity or tenor of the swap, while for other derivative instruments, funds use the duration of the underlying reference asset. *See* ICI July 28, 2016 Comment Letter.

2.3. Currency

To understand the risk of currency, we estimate currency risk using the Nominal Broad Dollar Index, obtained from the Federal Reserve Board website.[20] The broad index is a weighted average of the foreign exchange values of the U.S. dollar against the currencies of a large group of major U.S. trading partners.[21]

We compare the risk of currency to the risk of the S&P 500 index from 1973 to July 2016, the period for which we have data for both data series. We follow the same approach discussed above by dividing the standard deviation of this currency basket by the standard deviation of the S&P 500. The comparison yields a risk adjustment multiplier of 29%, as compared to the 40% multiplier implied by the PR, CFTC, and BIS schedules. The schedules are broadly consistent with our analysis, which is based on a broad currency index that is highly diversified. This analysis, however, does not address whether narrower groupings of currencies or particular currencies would yield different risk adjustment multipliers.

3. Haircut Schedule

In addition to risk-based notional amount adjustments, commenters also suggested that the final rule permit funds to maintain high quality and liquid assets in addition to cash and cash equivalents as qualifying coverage assets.[22] Many commenters also suggested that the haircuts applicable to these assets be determined pursuant to the schedule of assets that may be used to satisfy the PR and CFTC margin requirements for uncleared swaps.[23] In light of these comments, we summarize assets that may be used to satisfy these margin requirements and analyze these assets and their corresponding haircuts in light of historical risk levels across certain asset classes.

[20] The data is available from Federal Reserve Board website at http://www.federalreserve.gov/datadownload/Choose.aspx?rel=h10.

[21] For details on the construction of the index, see the article in the Winter 2005 Federal Reserve Bulletin, available at http://www.federalreserve.gov/pubs/bulletin/2005/winter05_index.pdf.

[22] *See* SIFMA Letter, *supra* note 2, at 29.

[23] *See id.*; *see also* ICI July 28, 2016 Comment Letter; Comment Letter of the US Chamber of Commerce (Mar. 28, 2016), *available at* https://www.sec.gov/comments/s7-24-15/s72415-148.pdf; Comment Letter of Vanguard (Mar. 28, 2016), *available at* https://www.sec.gov/comments/s7-24-15/s72415-162.pdf.

Table 6. Margin Values for Eligible Noncash Margin Collateral from PR/CFTC Schedules

Asset Class	*Discount %*
Eligible government and related (e.g., central bank, multilateral development bank, GSE securities identified in §23.156(a)(1)(iv)) debt[1]: residual maturity less than one-year.	0.5
Eligible government and related (e.g., central bank, multilateral development bank, GSE securities identified in §23.156(a)(1)(iv)) debt[1]: residual maturity between one and five-years	2.0
Eligible government and related (e.g., central bank, multilateral development bank, GSE securities identified in §23.156(a)(1)(iv)) debt[1]: residual maturity greater than five-years	4.0
Other eligible publicly traded debt[2,3]: residual maturity less than one year	1.0
Other eligible publicly traded debt[2,3]: residual maturity between one and five years	4.0
Other eligible publicly traded debt[2,3]: residual maturity greater than five years	8.0
Equities included in S&P 500 or related index	15.0
Equities included in S&P 1500 Composite or related index but not S&P 500 or related index[24]	25.0

[1] This category includes any security that is issued by, or fully guaranteed as to the payment of principal and interest by, the European Central Bank or a sovereign entity that is assigned no higher than a 20 percent risk weight under the capital rules applicable to the covered swap entity, or an OECD Country Risk Classification rating of 0-2.

[2] This category includes corporate and municipal debt securities that are investment grade, as defined by the prudential regulators.

[3] Note that GSE debt securities not identified in §23.156(a)(1)(iv) receive the same discounts as Other eligible publicly traded debt.

First, to understand how the schedule of assets that may be used to satisfy the PR and CFTC margin requirements for uncleared swaps relates to the underlying risk of certain margin-eligible assets, Table 7 reports haircut discounts computed based on historical risk levels of various asset classes and compares them to the schedules. The risk ratios reported in the table are calculated by dividing the standard deviation of the given reference asset by the standard deviation calculated for the S&P 500. The haircut discounts are then computed by multiplying that risk ratio by the haircut (15%) set for the S&P 500.[25]

[24] We did not analyze the risk associated with the S&P 1500 due to data limitations.

[25] Our review of Table 6 does not seek to analyze the entire PR/CFTC schedule, but rather to examine common categories of assets (U.S. Treasury securities, corporate debt, and equity).

Table 7. Haircut Schedule Based on Risk

		(1)	*(2)*	*(3)*	*(4)*	*(5)*
Asset Class		*Risk Level (standard deviation of historical returns)*	*Haircut/ Discount under PR/CFTC schedules*	*Risk Ratio implied by PR/CFTC schedules*	*Risk Ratio computed relative to Equity risk level*	*Haircut/ Discount Computed*[e]
Treasury[a,b]	<1yr	0.18	0.5	3%	4%	0.6
	1-5yr	0.62	2	13%	14%	2.1
	>5yr	2.48	4	27%	56%	8.4
Corporate[c,d]	<1yr	—[g]	1	7%	—[g]	—[g]
	1-5yr	0.90	4	27%	22%	3.3
	>5yr	2.24	8	53%	55%	8.3
Equity (S&P 500)		4.45[f] (4.09)	15	100%		

[a] The securities in the regulatory schedule are defined as eligible "government and related"
[b] The risk is computed using U.S. Treasury series from 1997 to 2016
[c] The securities in the regulatory schedule are defined to include certain eligible "publicly traded debt"
[d] The risk is computed using AAA and BBB corporate bond series from 2004 to 2016. The risk of corporate 1-5 year series is computed using 1-3 and 3-5 year corporate series
[e] Haircut Discount Computed = Risk Ratio Computed × Equity Haircut = Risk Ratio Computed × 15
[f] The risk levels of equity (S&P 500) are 4.45% from 1997 to 2016 and 4.09% from 2004 to 2016
[g] Due to data limitations, we do not analyze risk of corporate debt with maturity of less than 1 year

Comparing the existing discounts, or haircuts, reported in column 2 and the discounts based on risk levels reported in the last column, we observe that the existing haircut schedule generally is consistent with the underlying risk levels of the reference assets. The risk level of the long-term U.S. Treasury securities, however, based on historical risk levels, is higher than the risk level implied in the existing haircut schedule (i.e., 56% vs 27% as compared to equity). We note, however, that if we focus on the 5–10 year U.S. Treasury series, our risk analyses indicate a 35% risk ratio and a 5.3 haircut/discount, which are roughly consistent with the existing schedule.[26]

[26] Note also that corporate debt securities included in this analysis only consist of AAA and BBB bonds; high-yield categories are not included so as to facilitate the comparison with the existing schedule. Therefore, the risk differences between corporate and Treasury securities appear small, especially for the long-term maturity series. But our analyses show that high-yield bonds are more than twice as risky as comparable Treasury securities.

In addition, the 15% discount for domestic large capitalization equities is used in our analyses as a benchmark to compare risk levels and set the schedule. To understand whether this discount level is consistent with the observed volatility of large capitalization domestic equities, we further perform VaR tests on the S&P 500. These allow us to understand how much equity value can be expected to be lost under extreme conditions. Using monthly data from the past four decades, we observe that 1% of the time, the S&P 500 index can be expected to lose more than 11% in value over a month (*i.e.*, approximately 20 trading days). The haircut schedule included in the PR and CFTC rules for uncleared swaps is generally consistent with this analysis, in that it provides for a 15% haircut for large cap equity securities and provides a greater haircut of 25% for other equity securities that generally would be expected to experience greater volatility.

4. Risk Analyses for Crisis Periods

To further understand whether the values in the regulatory schedules are consistent during crisis periods when market volatility increases, we perform the above risk analyses using data from 2008 to 2010. Overall, the risk ratios among various asset classes stay roughly consistent with those found in the overall sample. The detailed results are attached in the appendix.

Appendix: Risk Analyses during 2008-2010

A.1. Risk Analyses for U.S. Treasury Securities vs Equity

	(1)	*(2)*	*(3)*	*(4)*
Asset Class	*Risk Level (standard deviation of historical returns)*	*Initial Margin Requirement under PR/ CFTC/BIS schedules*	*Risk Ratio implied by PR/CFTC/BIS schedules*[a]	*Risk Ratio computed relative to Equity risk level*
Equity	6.40	15%	100%	100%
Treasury IR: 0–2y	0.25[b]	1%	7%	4%
Treasury IR: 2–5y	0.80[c]	2%	13%	12%
Treasury IR: 5+y	3.62[d]	4%	27%	57%

[a] This is computed as initial margin requirement divided by the initial margin requirement of equity (15%).
[b] Computed using interest rate of Treasury 0-3 months, 1-2 years
[c] Computed using interest rate of Treasury 1-5 years
[d] Computed using interest rate of Treasury 5-10, 10-20, and 20+ years

A.2. Risk Analyses for Corporate Debt vs Equity

	(1)	*(2)*	*(3)*	*(4)*
Asset Class	*Risk Level (standard deviation of historical returns)*	*Initial Margin Requirement under PR/CFTC/BIS schedules*	*Risk Ratio implied by PR/CFTC/BIS schedules*	*Risk Ratio computed relative to Equity risk level*
Equity	6.40	15%	100%	100%
Credit: 0–2y duration	1.27[a]	2%	13%	20%
Credit: 2–5y duration	2.25[b]	5%	33%	35%
Credit 5+y duration	3.91[c]	10%	67%	61%

[a] Computed using AAA and BBB 1-3 years
[b] Computed using AAA and BBB 3-5 years and 5-7 years
[c] Computed using AAA and BBB 7-10, 10-15 and 15+ years

A.3. Haircut Schedule Based on Risk

		(1)	*(2)*	*(3)*	*(4)*	*(5)*
Asset Class		*Risk Level (standard deviation of historical returns)*	*Haircut/ Discount under PR/CFTC schedules*	*Risk Ratio implied by PR/CFTC schedules*	*Risk Ratio computed relative to Equity risk level*	*Haircut/ Discount Computed*[b]
Treasury[a,b]	<1yr	0.08	0.5	3%	1%	0.2
	1-5yr	0.80	2	13%	12%	1.9
	>5yr	3.62	4	27%	57%	8.5
Corporate[a]	<1yr	—	1	7%	—	—
	1-5yr[c]	1.56	4	27%	24%	3.7
	>5yr	3.59	8	53%	56%	8.4
Equity (S&P 500)		6.40	15	100%		

[a] Computed using AAA and BBB series
[b] Haircut Discount Computed = Risk Ratio Computed × Equity Haircut = Risk Ratio Computed × 15
[c] Computed using 1-3 and 3-5 year corporate series