S&P Global
Ratings

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Criteria | Financial Institutions | Fixed-Income Funds:
Fund Volatility Ratings Methodology

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Fund Volatility Ratings Methodology

SCOPE AND OVERVIEW

1. S&P Global Ratings' methodology for assigning fund volatility ratings (FVRs) to fixed-income funds provides transparency to help market participants better understand our approach to assigning FVRs, enhances the forward-looking nature of these ratings, and enables better comparison of FVRs assigned to funds denominated in the same currency. This update follows our request for comment, "Request For Comment: Fund Volatility Ratings Methodology," published on Sept. 26, 2016.

2. An FVR is a forward-looking opinion about a fixed-income investment fund's volatility of returns relative to that of a "reference index" denominated in the base currency of the fund. A reference index is composed of government securities associated with the fund's base currency. For example, the reference index for a bond fund denominated in U.S. dollars would be composed of U.S. government securities. A reference index for a bond fund denominated in euros would be composed of bonds from more than one eurozone sovereign issuer, such as for a eurozone government bond index.

3. Unlike traditional credit ratings, FVRs are not globally comparable and do not address a fund's ability to meet payment obligations. FVRs reflect our expectation of a fund's future volatility of returns to remain consistent with its historical volatility of returns. An FVR is not a commentary on yields generated by funds, although the volatility of yields does factor into the volatility of fund returns.

4. Different symbology is used to distinguish fund volatility ratings from S&P Global Ratings' traditional issue or issuer credit ratings. The FVR scale ranges from 'S1+' to 'S5' (see Appendix A). A rating of 'S1+' reflects funds with the lowest volatility whose asset maturities typically do not exceed one year. A rating of 'S5' reflects funds with the highest volatility, as well as additional portfolio and management risks such as high concentration risks, high leverage, or investments in complex structured or illiquid securities that we believe will cause volatility to exceed the volatility of 'S4' rated funds. FVRs typically accompany fund credit quality ratings (e.g., 'Af/S3') to communicate our opinion of risks not addressed by fund credit quality ratings (FCQRs) (see "Fund Credit Quality Ratings Methodology," published June 26, 2017). For some funds, we may assign an FCQR without an accompanying FVR. For example, this could occur for new funds with insufficient track records, which limits our ability to assess volatility of returns. When this occurs, we note the FVR as NR (not rated).

Key Publication Dates

- Original publication date: June 26, 2017
- Effective date: These criteria are effective immediately, except in markets that require prior notification to, and/or registration by, the local regulator. In these markets, the criteria will become effective when so notified by S&P Global Ratings and/or registered by the regulator. We intend to complete our review of all affected ratings within the next six months.
- These criteria address the fundamentals set out in "Principles Of Credit Ratings," published on Feb. 16, 2011.

5. The criteria apply globally to fixed-income funds and other portfolios or pools of fixed-income assets (both actively and passively managed).

METHODOLOGY

6. We determine FVRs in four steps, which include quantitative and qualitative assessments of a fund and its investment manager. In the first step, we assess the historical volatility and dispersion of fund returns relative to reference indices. In the second step, we assess portfolio risk. In the third step, we assess management. In the fourth step, we compare the fund with other similar funds. Step one results in the preliminary FVR. Steps two and three result in the intermediate FVR. Step four results in the final FVR.

7. The first step establishes our initial view of the volatility of a fund's returns. In the primary assessment, we compare the standard deviation of monthly returns, and in the supplemental assessment, we compare the distribution of the monthly returns of the fund to those of reference indices.

8. In the second step, we assess the fund's portfolio risks to determine whether, in our opinion, the fund is likely to experience similar, higher, or lower volatility of returns as compared with the reference index in the next 12 months. We assess four primary portfolio risk indicators: duration, credit exposure, liquidity, and the combined impact of derivatives, leverage, foreign currency, and concentration. The first three primary portfolio risk indicators assess interest rate risk, credit risk, and liquidity risk. The fourth primary risk indicator combines our assessment of four secondary portfolio risk subindicators: use of derivatives, use of leverage, exposure to foreign currency risk, and investment concentration. We evaluate these indicators and subindicators to determine whether the combination of these will lead to lower or higher volatility than what we observed in the preliminary FVR.

9. In the third step, we assess fund management. We assess the risk of management's willingness and ability to maintain the current volatility profile of the fund through four categories: management and organization, risk management and compliance, credit culture, and credit research capabilities.

10. In the fourth step, comparable ratings analysis, we compare the fund with peers to determine whether a final adjustment of one rating category up or down is warranted to determine the final FVR.

FVR Methodology Overview

Step 1

Quantitative Assessment Of Historical Volatility And Dispersion Of Fund Returns

Primary assessment	The primary assessment centers on the historical **level** of volatility of the fund's monthly returns in relation to those of indices we identify as reference indices. Here we analyze the most recent four years of return data to generate a line chart representing the volatility of monthly returns for the fund and for reference indices. The line chart compares the rolling (trailing) annualized standard deviation over the most recent 36 months of fund returns against those of the reference indices over the same period.
Supplemental assessment	The supplemental assessment compares the **distribution** of the fund's monthly returns in relation to that of the reference index. Here we generate histograms that display the distribution of returns over the most recent six, 12, and 36 months for the fund and the reference index.

= Preliminary FVR

Step 2

Portfolio Risk Assessment

	More conservative	*Consistent*	*More aggressive*
• Duration • Credit exposure • Liquidity • Derivatives, leverage, foreign currency, and concentration			

= Intermediate FVR

Step 3

Management Assessment

	Strong	*Adequate*	*Weak*
Management and organization • Key-man risk • Investment and asset class experience • Reporting and operating structure			
Risk management and compliance • Risk management and compliance personnel • Risk management and compliance standards • Compliance systems and tools			
Credit culture • Credit management standards • Strategy, culture and risk appetite			
Credit research • Staff • Credit monitoring • Capabilities • Systems and tools			

= Potential adjustment to Intermediate FVR

Step 4

Comparable Ratings Analysis

In the step, we compare the fund with funds denominated in the same base currency and similar in portfolio strategy and composition, and with similar management. The assessment can lead us to raise or lower our rating, based on our overall assessment of the fund's quantitative and qualitative characteristics. This involves taking a holistic review of a fund's portfolio risk and management's strengths and weaknesses compared with peers.

= Final FVR

I. Preliminary FVR

A. Historical Volatility And Dispersion Of Fund Returns

11. The first step, which results in the preliminary FVR, is made up of a primary quantitative assessment and a supplemental quantitative assessment. The primary assessment centers on the historical level of volatility of the fund's monthly returns in relation to those of indices we identify as reference indices. The supplemental assessment compares the distribution of the fund's monthly returns with that of the reference index. We view a change in the distribution of monthly returns as an indicator of potential change in the volatility of future returns.

12. In the primary quantitative assessment, we use at least four years of the most recent return data to generate a line chart representing the volatility of monthly returns for the fund and for reference indices. The line chart compares the rolling (trailing) annualized standard deviation of the fund's returns over the most recent 36 months against those of the reference indices over the same period (see table 1). Each reference index is specific to a maturity band that we associate with a preliminary FVR. We determine which of the reference indices have a historical monthly return volatility (annualized standard deviation) closest to that of the fund. That index is identified as the reference index for the fund rating (see Appendix D).

Table 1

Maturity Bands For Reference Indices

Rating	Years to maturity*
S1+	0-1
S1	1-3
S2	3-7
S3	7-10
S4	10+
S5	A rating of 'S5' is assigned to funds that exhibit additional portfolio and management risks such as high concentration risks, high leverage, and investments in complex structured or illiquid securities that we believe will affect future volatility and cause them to exceed the volatility of 'S4' rated funds.

*Refer to section “Indices that do not match the maturity bands” for further information.

13. In the supplemental quantitative assessment, we generate histograms that display the distribution of returns over the most recent six, 12, and 36 months for the fund and the reference index. A wider distribution of returns can presage an increase in annualized standard deviation not yet visible in the rolling volatility chart. For example, the histograms may indicate the fund's recent return values exceed those of the reference index, but the dispersion is not yet wide enough to affect the historical annualized standard deviation in the primary assessment. The supplemental analysis focuses on spotting early changes in the fund's return trends not captured in the primary assessment.

14. The preliminary FVR indicated in the primary assessment can be adjusted up or down based on the results of the supplementary assessment when it indicates there is a developing variation in the fund's return trends that may not yet be observable in the plot of historical annualized standard deviation.

15. When histograms indicate the distribution of returns is wider than that of the reference index and we believe this reflects a likely increase in the volatility of returns, we assign a preliminary FVR weaker by one rating than the preliminary FVR indicated by the primary assessment (for example, to 'S4' from 'S3'). When histograms indicate the distribution of returns is narrower than those of the reference index and we believe this reflects a likely decrease in the volatility of returns, we assign a preliminary FVR stronger by one rating than the preliminary FVR suggested in the primary assessment (for example, to 'S1' from 'S2') (see Appendix C).

Ratings caps

16. We cap the FVR for funds whose reference index includes significant exposure to one or more speculative-grade sovereign issuers. We cap the FVR for these funds at 'S2' when the sovereign issuer or issuers are rated in the 'BB' category ('BB+', 'BB', or 'BB-') and at 'S3' when the sovereign issuer or issuers are rated in the 'B' category ('B+', 'B', or 'B-') or lower. We cap the FVR because we believe the volatility of returns will be high due to the low creditworthiness of the sovereign and we view the volatility of securities in those markets as being more likely to deviate from past historical patterns due to their lower credit quality. The cap is intended to avoid the possibility that a fund invests in issuers whose returns are volatile but qualify for a strong FVR, such as 'S1', because the reference index returns are also volatile, and as such, the quantitative assessment supports the strong rating.

17. For funds whose reference index is a blend of sovereigns, such as for a market-weighted European Government Bond Index, there may be a range of creditworthiness of the sovereigns. Where we expect speculative-grade exposure in the reference index to contribute significant volatility to returns, we will cap the fund volatility rating. We typically cap the rating at 'S2' or 'S3' based on the exposure to 'BB' or 'B' rated exposures, as indicated above.

Funds with short or no track records

18. If the fund does not calculate monthly returns, or has less than the four years of monthly return information required to assess the preliminary FVR, we evaluate available information including a comparable ("proxy") fund, designated benchmark, or reference index performance. We use fund portfolio guidelines to determine a hypothetical (i.e., model) portfolio. Existing holdings and manager performance gained with other funds may inform our quantitative and qualitative assessments. The following approaches typically apply, conditioned by availability, relevance, amount of historical information, the fund's portfolio guidelines, existing holdings, model portfolio, and the management's track record:

- When we believe there is a comparable proxy fund, designated benchmark, or reference index (with similar credit, sector, and maturity as the fund seeking an FVR) with at least four years of historical data, we would assign our preliminary FVR based on the proxy fund, designated benchmark, or reference index history.
- When we believe there is no comparable proxy fund, designated benchmark, or reference index (with similar credit, sector, and maturity) with at least four years of historical data, the FVR would be NR. We cannot assign an FVR solely based on portfolio guidelines and management representation.

Indices that do not match the maturity bands

19. In some countries, reference indices may not be available for a specific maturity band. When this is so, we may use government indices with different maturity bands if we view those indices as sufficiently close to the standard maturity bands to calibrate the risk level of that specific bond market. For example, we may compare a fund with an index composed of sovereign bonds with maturities ranging from three to five years instead of three to seven years. We use

that index and apply the preliminary FVR most closely relevant to that index--in this example, it would be the 'S2' applicable to reference indices invested in government securities with three- to seven-year maturities. When no government bond indices are available, as may be the case in certain small or developing bond markets, we typically will be unable to assign an FVR unless a proxy for an index can be determined. We will use deposit rates of banks with high credit quality in the relevant currency as the reference index to assess volatility of returns when short-maturity government securities indices are not available.

II. Intermediate FVR

20. Our assessment leading to the determination of the intermediate FVR is composed of two steps: In the first, we focus on portfolio risk, and in the next, we focus on management risk. The fund's portfolio risk and management's strategy are typically already reflected in the historical volatility of returns that determine the preliminary FVR. If our forward view of management is that it will manage in a way that is consistent with past volatility of returns, the management assessment results in no modification of the intermediate FVR. This may be the case despite one or more categories that make up our management assessment being assessed as "strong" or "weak."

21. When our forward view of the fund's portfolio risk is that it will be consistent with the history of portfolio risk that determined the preliminary FVR, we assess the portfolio risk as "consistent" and the portfolio risk assessment does not modify the FVR. This reflects our view that portfolio risk is already fully embedded in our assessment of the historical volatility of returns. For funds whose portfolio risk assessment suggests volatility of returns is likely to exceed what we observed in the preliminary FVR, we assess portfolio risk as "more aggressive" and set the intermediate FVR weaker than the preliminary FVR. If our view is that portfolio risk will diminish, we assess portfolio risk as "more conservative" and set the intermediate FVR stronger than the preliminary FVR. If our management or portfolio risk assessment (or both in combination) suggest that the future volatility of returns is likely to exceed those of the 'S4' reference index, we assign an intermediate FVR of 'S5'.

22. When management indicates a change in strategy, we typically are biased to the downside and immediately assume its impact on the portfolio risk or management assessment if it implies greater future volatility of returns. However, if the change in strategy implies a lower volatility of returns, we will maintain the current FVR until we observe execution of the strategy for a minimum of three months and typically wait six months before confirming it in our assessment. For managers who have sufficient track records, and if we believe the change is sustainable, we may change the FVR immediately.

23. An example of the potential impact of the qualitative assessments: A fund whose quantitative assessment indicates a rating of 'S1' may then have a final FVR of 'S3', which would reflect a portfolio risk assessment of "more aggressive" and a management assessment of "weak," neither of which were already reflected in the past volatility of returns. The rating is lowered by one category for each qualitative assessment weakness. When assessing these risks, we view these holistically to ensure that the respective assessments do not replicate incremental risks already captured.

24. In addition to actual portfolio holdings, we consider the fund's prospectus, internal investment guidelines, and the latitude given to the investment manager, as demonstrated in prior investment strategy, in implementing the fund's

investment strategy to determine the likelihood of one or more of the factors of the management assessment affecting the volatility of returns relative to the historical returns.

A. Portfolio Risk Assessment

25. The portfolio risk assessment focuses on measuring changes in quantifiable portfolio risk factors, including interest-rate risk, credit risk, liquidity risk, derivative risk, leverage risk, foreign-currency risk, and concentration risk. Risk or volatility can manifest itself in either a continuous fashion or at discrete intervals, in which case the perception of low volatility can often prevail for an extended period. For example, interest-rate-sensitive funds (funds that invest in long maturity, highly creditworthy securities like U.S. Treasury securities) can exhibit more volatility than funds that invest in low-grade, high-yield, or illiquid securities; however, at times, these low-grade funds can exhibit high to extremely high volatility due to investor sentiment regarding increased default or liquidity risks. We look at four portfolio risk indicators that we view as important to each fund we rate. The first three are duration, credit exposure, and liquidity, and each on its own could lead us to assess portfolio risk as "more aggressive." The fourth indicator is composed of the following subindicators: derivatives, leverage, foreign currency, and concentration.

Impact of portfolio risk indicators

26. If we assess one or more of these indicators as "more aggressive," then we also assess the fund's portfolio risk as "more aggressive" and we set the intermediate FVR one category weaker than the preliminary FVR before adjustment, if any, for the management assessment. We assess the indicator as "more aggressive" when we believe it will lead to higher volatility of returns. If we believe the incremental higher volatility of returns will be significant, then the intermediate FVR will be two categories lower than the preliminary FVR.

27. Conversely, when we assess the combination of portfolio risk indicators as "more conservative," we also assess portfolio risk as "more conservative" and we set the intermediate FVR one category stronger than the preliminary FVR before adjustment, if any, for the management assessment. We assess an indicator as "more conservative" when we believe it will lead to lower volatility of returns in the future. Where we believe a change in strategy represents a fundamental shift, we typically recalculate the FVR as described in step one. The combination is "more conservative" when one or more of these indicators is "more conservative" and none are "more aggressive," or when "more conservative" indicators offset "more aggressive" indicators such that we believe the volatility of returns will be lower.

A1. Duration

28. We assess the duration of a fund's portfolio to measure the fund's sensitivity to changes in interest rates. We consider duration because it represents the expected percentage change in the value of a portfolio given a general fluctuation in interest rates, which affects the total return of the fund. We view returns of funds with a higher duration as potentially more volatile because the fund's assets carry higher price volatility risk than those of funds with lower durations.

Table 2

Duration

Indicator	More conservative	Consistent	More aggressive
Duration	We believe a shift to a more conservative interest-rate strategy and changes in fund duration reflect a move to a less sensitive duration than indicated by historical returns assessed in step one, and we believe that volatility of returns resulting from interest-rate risk exposure will dampen.	The fund's maturity is relatively unchanged and has remained consistent over time. We believe that volatility resulting from interest rate risk will remain consistent with what is reflected in past historical returns.	The fund's interest rate sensitivity has significantly increased, and we believe the new duration targets will increase volatility of returns compared with what is reflected in past historical returns; or we believe existing interest-rate sensitivity of returns will lead to higher volatility of returns.

A2. Credit Exposure

29. Credit exposure can also influence the volatility of a fund's returns. As described above, the credit quality of the reference index itself can cap the FVR. Here, we assess credit exposure to determine whether a change in the credit risk profile of the asset portfolio is likely to affect the volatility of returns. We assess credit exposure as "more aggressive" or "more conservative" when we believe the fund's volatility of returns will differ from that reflected in the preliminary FVR due to a material change in the credit quality of the fund and, in particular for high-credit-quality funds, an increase in exposure to speculative-grade credit.

Table 3

Credit Exposure

Indicator	More conservative	Consistent	More aggressive
Credit exposure	We believe volatility of returns will decrease due to an improvement in credit quality.	We don't expect the volatility of returns to change due to changes in credit quality.	We believe volatility of returns will increase due to a deterioration of credit quality.

A3. Liquidity

30. We associate lower levels of asset liquidity with higher volatility of fund returns. We believe investment in illiquid assets exposes the fund to higher volatility of returns when (a) the unobserved volatility of asset prices, typical of illiquid assets, is transformed into observed volatility of prices (and of asset returns) when market events lead to price discovery, or (b) when the fund experiences redemptions that force the manager to exhaust cash reserves and sell illiquid assets and realize price volatility, which may occur during periods of market stress.

31. We evaluate four subindicators to determine our assessment of a fund's liquidity: (i) sector analysis, which addresses issuer type; (ii) rating analysis, which addresses portfolio credit quality; (iii) issue size analysis, which addresses asset marketability; and (iv) maturity analysis, which addresses the maturity profile of the fund's underlying investments. We assess these subindicators using the following principles: less complex assets are more liquid, higher-rated assets are more liquid, larger issues are more liquid (because they are more widely followed by analysts), and shorter maturity assets are more liquid (because the number of funds that can invest increases as maturity is shorter). Also, we recognize that shorter-maturity assets are less exposed to interest-rate risk, and as a result, are more liquid.

Table 4

Liquidity			
Indicator	**More conservative**	**Consistent**	**More aggressive**
Liquidity	We believe liquidity will improve and reduce future volatility of returns.	The volatility of future returns is not expected to change due to changes in liquidity.	We believe future volatility of returns will increase due to a decrease in liquidity.

A4. Fourth Portfolio Risk Indicator

32. The fourth portfolio risk indicator combines four subindicators: use of derivatives, leverage, foreign currency exposure, and concentration risk. We evaluate whether the combination of these underlying risks will lead to lower or higher volatility in the preliminary FVR than observed in the preliminary FVR. When we believe the combination of subindicators will lead to lower or higher volatility of returns relative to the preliminary FVR, we assess the fourth portfolio risk indicator as "more conservative" or "more aggressive."

Table 5

Fourth Portfolio Risk Indicator			
Indicator	**More conservative**	**Consistent**	**More aggressive**
Derivatives, leverage, foreign currency, and concentration	We believe one or more of the following factors will lead to lower volatility of returns and the portfolio changes are starting to be observed in portfolio reports: (i) Derivatives are being increasingly employed for hedging purposes, or the fund manager has shifted strategy away from using derivatives to increase risk; (ii) The fund no longer employs leverage or has significantly reduced its use of leverage; (iii) The fund no longer takes any currency risk or has significantly reduced its foreign currency risk; or (iv) The fund has increased the diversity of its portfolio.	We believe volatility of returns will not be changed due to any change in use of derivatives, leverage, foreign currency, or concentration.	We believe one or more of the following factors will lead to higher volatility of returns: (i) The fund initiates or increases use of derivatives for speculative purposes; (ii) The fund initiates leverage or increases use of leverage; (iii) The fund initiates or significantly increases exposure to currency risk; or (iv) The fund has increased the concentration of its portfolio.

B. Management Assessment

33. A long-term commitment to a particular investment objective and risk-tolerance level by the fund's adviser and portfolio manager is typically reflected in the return history. Where there are significant differences between the current portfolio risk indicators and historical return profiles, the management assessment becomes particularly important. Discussions with fund management about investment policies and strategies, asset selection, internal research capabilities, and portfolio risk monitoring help us to assess the fund's current and ongoing risk profiles.

34. In step three, we assess whether management is willing and able to maintain the volatility of returns consistent with past return volatility. The management assessment could modify the intermediate FVR. If we assess management as "weak," it weakens the intermediate FVR. If we expect management to maintain the current level of volatility of returns, we keep the intermediate FVR unchanged. A "strong" management assessment does not lead to a stronger intermediate FVR because we believe that strength is already embedded in our assessment of the historical returns. However, a "strong" management assessment can influence the final FVR because it is a necessary condition for an upward comparable ratings adjustment in step four. If management has documented and implemented a change in strategy to dampen fund return volatility, we typically will recognize that strength in the portfolio risk assessment

where changes to portfolio risk are observed.

35. We assess management by applying the same four categories of the management assessment for FCQRs: management and organization, risk management, credit culture, and credit research. We assess each category as "strong," "adequate," or "weak." We evaluate each category in the management section holistically to determine the whole category assessment.

Impact of the management assessment--intermediate FVR

36. The management assessment is forward-looking and is informed by historical performance. If we believe management will not increase or decrease the volatility of returns relative to historical returns, there is no modification to the intermediate FVR. If one or more management categories is "weak" but we believe the impact of that risk is already embedded in our assessment of the high volatility of historical returns and the corresponding preliminary FVR, then we make no adjustment to the intermediate FVR. For example, if we assess credit culture as "weak," this would lower the FCQR on the fund. But we may also believe that "weak" credit culture is already reflected in high volatility of returns. In this case, the FVR is unchanged by the "weak" management assessment.

37. If we assess any category as "weak" and we believe the impact is not already embedded in our assessment, the intermediate FVR is at least one rating level weaker than the preliminary FVR after having been adjusted by the portfolio risk assessment (e.g., to 'S2' from 'S1') and may be more than one level weaker if the weakness is significant and we believe these risks will significantly increase volatility of returns.

38. When no category is assessed as below "adequate," the intermediate FVR is unchanged by the management assessment. If we assess one or more categories as "strong" and none as "weak," we may consider a fund's management strength in the final step, the comparable ratings analysis.

39. We typically evaluate management at the fund investment manager level. Management's ability is assessed relative to its funds' strategies, and its ability to execute in each category of the management assessment. A "weak" assessment of a management category is likely to affect the ratings on multiple funds managed by a sponsor with the same manager/sponsor. We do not incorporate assessments of credit culture or credit research of managers for funds that are passively managed against an index.

B1. Management And Organization

40. A fund's investment management team is assessed for the presence of key-man risk, investment and asset class experience, and reporting and operating structure.

Table 6

Management And Organization

Component	Strong	Adequate	Weak
Key-man risk	Multiple people are capable of managing the fund. The fund managers use a team-based approach or are cross-trained. The loss of key personnel would not impair the fund's operations.	At least one person is capable of managing the fund if the portfolio manager leaves. Either a team-based approach is applied or staff members are crossed-trained so that a departure by key personnel would not impair the fund's operations.	There is no backup fund manager or resources within the team to effectively manage the fund. A departure of key personnel would impair the fund's operations.
Investment and asset class experience	The fund managers have considerable relevant experience pertinent to the overall strategy of the fund. Relevant experience pertains to sectors (e.g., utilities) and asset classes (e.g., fixed income securities, municipal securities, asset-backed securities, residential mortgage-backed securities, commercial mortgage-backed securities, preferred shares, etc.). It also pertains to investment strategies (i.e. exchange-traded funds, use of leverage, and derivatives). Generally, we view considerable experience to be more than five years or experience through an economic cycle.	The fund managers have adequate experience in various sectors, asset classes, and investment strategies pertinent to the overall strategy of the fund.	The fund managers have limited experience in sectors, asset classes, or investment strategies pertinent to the overall strategy of the fund that could reduce the effectiveness of portfolio management. Generally, we view experience of less than one year as limited.
Reporting and operating structure	The portfolio management team has a clear and distinct reporting structure that is separate from the trading and credit research team. The firm has critical supporting structures. Front office structure typically includes a trading team, an investment management team, and a sales and marketing team. Middle office structure typically includes a pricing and valuations team. Back office structure typically includes a systems and IT team.	The portfolio management team can demonstrate a sufficiently clear and distinct reporting structure or similar check and balance between trading and credit research decision making. The firm has supporting functions that are commensurate with the investment activities.	The portfolio management team does not have sufficiently clear or distinct reporting structures, or an effective method to ensure sufficient check and balance between trading and credit research decision making.

B2. Risk Management And Compliance

41. In risk management and compliance, we assess fund governance, operational risk controls, and regulatory compliance. Examples of activities for which risk management and compliance standards and policies are assessed include trade ticket verification, risk escalation, pricing and business recovery, portfolio monitoring, portfolio stress testing, and pretrade and post-trade compliance systems. We consider stress tests useful to gauge a fund's credit quality exposure to one or more sovereign, nonsovereign, or counterparty exposure. However, when portfolio credit quality is clearly linked to the rating on one sovereign, counterparty, or obligor, the stress test would not further enhance our assessment and hence we would not incorporate a credit-based stress test in our assessment. Similarly, we would not expect to review stress testing for funds investing solely in nonsubordinated investments whose obligors are rated 'AA' or higher. In each example, we would not expect to review stress testing when sufficient fund standards and policies exist to verify that they are operating within the fund's stated objectives. Where they do not, we assess the category as "weak."

Table 7

Risk Management And Compliance

Component	Strong	Adequate	Weak
Risk management and compliance personnel	The investment manager has strong risk management capabilities and culture, as demonstrated through the following: evidence of effective challenge when risk tolerance has been breached and track record of resolution typically in favor of risk limits; a compliance team (dedicated compliance personnel) that has a separate reporting line to senior management (e.g., the board, CEO, etc.); and the number of and organization of staff is consistent with the size and complexity of the business.	The investment manager has adequate risk management capabilities and culture as demonstrated through the following: evidence of effective challenge when risk tolerance has been breached and track record of resolution; awareness of risk limits; a compliance team that has a reporting line to senior staff members; and the risk management team and compliance duties of staff are adequate for the size and complexity of the business.	The investment manager does not have adequate risk management capabilities or culture, or does not have an adequate compliance team or risk management resources in place. Compliance is not adequate when it is small relative to the size or lacking in experience relative to the complexity of the business.
Risk management and compliance standards	There are multiple layers of risk management and compliance oversight. The respective policies and procedures are documented and reviewed annually or as needed driven by market events. Stress testing is comprehensive. A comprehensive risk escalation procedure exists.	Policies and procedures for risk-management and compliance oversight tailored to the nature and complexity of the portfolio strategy are in place. The policies are documented and reviewed regularly (generally every two to three years). A sufficient number of risk factors and tolerances are monitored. Stress testing is sufficient relative to the strategy of the fund. An adequate risk escalation procedure is in place.	Minimal risk-management and compliance functions exist, leading to insufficient monitoring of risk factors; there is inadequate documentation or review of compliance standards and risk-management guidelines; suitable stress testing is not performed; or management repeatedly breaches the quantitative threshold (applicable to the preliminary FCQR).
Compliance systems and tools	The management team has robust portfolio monitoring tools to monitor the relevant risk factors of the fund. A strong, pretrade and post-trade compliance system or procedure is in place to enable the manager to monitor and manage compliance with the fund's guidelines.	The management team has sufficient portfolio monitoring tools to monitor the relevant risk factors of the fund. A functional compliance system or sufficient set of procedures is in place to monitor and manage to the fund's guidelines.	The management team has substandard portfolio monitoring capabilities, systems, or procedures to examine the relevant risk factors of the fund.

B3. Credit Culture

42. Credit culture refers to the extent that a fund's management develops and applies rigorous credit management standards. It also addresses a portfolio management team's resources and policies and the extent to which the team's objective is to efficiently manage the counterparty and credit risks of the fund's investments consistent with the current fund credit profile. A significant change in investment strategy will strengthen or weaken this assessment immediately for managers that have long (demonstrable) track records, and after an observation period of at least three to six months for managers without a long track record.

Table 8

Credit Culture

Component	Strong	Adequate	Weak
Credit management standards	Management has comprehensive written policies and processes in place to ensure that credit evaluations are consistently applied. The policies and processes are audited and updated at least annually. Incentives and policies are clearly defined and strongly aligned.	Management has sufficient policies and processes in place to ensure that credit evaluations are consistently applied. These policies and processes are periodically reviewed. Incentives and policies are aligned.	Management has minimal policies and processes to ensure that credit evaluations are conducted, or to ensure consistency of the credit evaluations; management has no procedure to update these policies and processes; or employee incentives and policies are not aligned.
Strategy, culture and risk appetite	The firm's credit risk appetite is embraced by portfolio managers, traders, and credit analysts. They deploy a consistent approach (i.e., top-down, bottom-up, or both) to credit risk management that is consistent with each fund's objectives and the preliminary FCQR and/or FVR. Acceptable tolerances are clearly identified and adhered to. Where applicable, portfolio managers and credit analysts share information on investments they own or are looking to own. The investment strategy has changed or we believe will change to improve fund credit quality.	There is an adequate understanding of the firm's risk appetite across portfolio and credit analysts. The team generally follows similar credit principles and investment criteria across the organization. Any divergence from established tolerances is minor and it does not affect its ability to manage to a specific FCQR and/or FVR. There is no change to fund credit quality due to investment strategy.	There is a lack of understanding of the firm's risk appetite across the investment management team and credit analysts. Consistent and sizable deviation from established tolerance or lack of documented tolerance may lead to a weaker FCQR (if assigned) and/or FVR. Fund credit quality has deteriorated or will deteriorate because of a change in investment strategy.

B4. Credit Research

43. Credit research reflects the depth and quality of a manager's credit analysis. We review the processes for credit evaluation, approval, and monitoring, and examine the purpose, focus, and consistency of its credit policies. We evaluate the credit process by reviewing the credit research team, analysts' sector and industry experience, independent analysis, and resources and tools. Specificity of roles and responsibilities within the credit team is an indicator of a robust credit process. The clarity and logic of the standard operating procedures is another facet of the credit process review. We assess the use of technology, the preservation and communication of credit analyses, and the use of external investment research and advisers to supplement, or compensate for gaps in, internal research.

Table 9

Credit Research

Component	Strong	Adequate	Weak
Staff	There is a deeply experienced credit research team with dedicated credit research analysts capable of conducting independent analysis.	The credit research team has average industry experience and staff is capable to meet the investment strategy and objectives.	There is limited independent credit research conducted, which may lead to reduced ability to effectively manage the credit risk of the portfolio.
Capabilities	The credit research team uses external and internal issuer fundamental research for credit analysis, including input from multiple market perspectives.	The credit research team conducts basic, internal issuer credit analysis with reliance on outside research to supplement their internal analysis. The existing process is sufficient with respect to fund investments.	There is little or no independent credit research and analysis, and lack of capabilities could leave the fund vulnerable to downgrade due to erosion of credit quality.

Table 9

Credit Research (cont.)			
Component	**Strong**	**Adequate**	**Weak**
Credit monitoring	All credit research files are maintained in a central location and are reviewed at least annually with issuer ratings monitored daily.	Credit research files are maintained and updated when necessary based on issuer-related events.	There are limited records of credit information or research files, or credits are not monitored in a consistent manner to capture changes in credit quality. If there are no records kept or no monitoring, this would be a significant weakness.
Systems/tools	The credit research team utilizes credit and/or other modeling techniques (examples of these techniques include assessing creditworthiness derived from market signals to complement fundamental analysis and/or modeling of forward credit risk commensurate with the level of risk the fund takes). There is detailed credit analysis that is both quantitative and qualitative.	The depth and breadth of credit analysis and tools is sufficient to research and review the investment strategy of the fund.	Valid systems or tools are not in place to support credit research functionality.

III. Comparable Ratings Analysis And Final FVR

44. In step four, the comparable ratings analysis, we compare the fund with funds denominated in the same base currency and similar portfolio strategy and composition with similar management. The assessment can lead us to raise or lower our rating based on our overall assessment of the fund's quantitative and qualitative characteristics. This involves taking a holistic review of a fund's portfolio risk and management's strengths and weaknesses versus peers. A positive assessment, supported by a "strong" management assessment, leads to a final FVR that is one category above an adjusted (if applicable) intermediate FVR, a negative assessment leads to a final FVR one category lower, and a neutral assessment results in no change to the adjusted (if applicable) intermediate FVR due to the comparable ratings analysis.

APPENDIX

A. Ratings Definitions

Table 10

Fund Volatility Ratings Definitions	
S1	A fund that exhibits low volatility of returns comparable to a portfolio of short-duration government securities, typically maturing within one to three years and denominated in the base currency of the fund, is rated 'S1'. Within this category, a fund may be designated with a plus sign (+). This indicates its extremely low volatility of monthly returns compared with a portfolio of short-duration government securities representing the highest-quality fixed-income instruments available in each country or currency zone with a maturity of 12 months or less. In the absence of short-duration government securities in a given country or currency zone, the volatility of one-year commercial bank deposit rates denominated in the base currency of the fund will be used as a benchmark proxy for 'S1+' rated funds.
S2	A fund that exhibits low to moderate volatility of returns comparable to a portfolio of short- to medium-duration government securities, typically maturing within three to seven years and denominated in the base currency of the fund, is rated 'S2'.
S3	A fund that exhibits moderate volatility of returns comparable to a portfolio of medium- to long-duration government securities, typically maturing within seven to 10 years and denominated in the base currency of the fund, is rated 'S3'.
S4	A fund that exhibits moderate to high volatility of returns comparable to a portfolio of long-duration government securities, typically maturing beyond 10 years and denominated in the base currency of the fund, is rated 'S4'.

Table 10

Fund Volatility Ratings Definitions (cont.)	
S5	A fund that exhibits high to very high volatility of returns comparable to a portfolio of long-duration government securities, typically maturing beyond 10 years and denominated in the base currency of the fund, is rated 'S5'. A fund rated 'S5' may be exposed to a variety of significant portfolio risks such as high concentration risks, high leverage, and investments in complex structured and/or illiquid securities.

B. Fund Volatility Ratings--National Scale

45. Current national scale rating definitions for fund volatility ratings are found in "S&P Global Ratings Definitions." For FVRs on national scales, we generally apply the global scale FVR criteria and then apply our national scale mapping tables to determine the national scale FVR (see Related Criteria And Research).

C. Examples Of Quantitative Assessments That Determine The Preliminary FVR

46. 1) In the primary assessment, the line plot of historical return volatility of a fund denominated in U.S. dollars with target maturity of one to three years closely matches the historical return volatility of the reference index associated with one- to three-year maturities of U.S. government securities. However, the plot shows in recent months the annualized standard deviation of the fund's monthly returns slightly exceed that of the one- to three-year reference index. In the supplemental assessment, the 12-month histogram indicates the fund's distribution of returns is wider than that of the reference index and shows a small number of outlier fund return values. This could be enough, on its own, to result in a preliminary FVR weaker than that indicated by the primary assessment's line plot and would be if observed over the coming three or six months. If the manager confirms that the outlier return values resulting in the increased annualized standard deviation in the primary assessment reflect a change in investment strategy whereby the fund is investing more aggressively than in the past, the preliminary FVR is made weaker without delay. If a change in strategy has already been implemented in an amended fund prospectus and confirms the supplementary assessment, the preliminary FVR is made weaker without delay. The primary assessment indicates the fund's volatility most closely aligns with that of the one- to three-year reference index, suggesting a preliminary FVR of 'S1'. The supplemental quantitative assessment suggests the distribution of fund returns will align more closely with that of the three- to seven-year reference index, and we believe this pattern of volatility is likely to continue. The preliminary FVR typically recommended by the analyst is 'S2', reflecting this forward view of volatility of returns supported by the change in strategy or evidenced in the supplemental assessment.

47. 2) In the primary assessment, the line plot of historical return volatility of a fund denominated in U.S. dollars with target maturity of one to three years closely matches the historical return volatility of the reference index associated with one- to three-year maturities of U.S. government securities. The plot shows the annualized standard deviation of the fund's monthly returns did not exceed that of the reference index. In the supplemental analysis, the 12-month histogram indicates the fund's distribution of returns is much narrower than that of the reference index. This would not be enough, on its own, to result in a preliminary FVR stronger than that indicated by the primary assessment's line plot, but it would be if observed over the coming three or six months. The manager indicates that the smaller variance in return values reflects a change in investment strategy whereby the fund is investing more conservatively than in the

past. This would enable a stronger preliminary FVR without delay if we believe the volatility will remain lower since the manager confirms what is observed in the supplemental assessment. The preliminary FVR could be stronger without delay if the supplemental assessment is supported by an amended fund prospectus. The fund could have a preliminary FVR of 'S1' based on the observations in the primary assessment, but the lower variance and narrower dispersion of fund returns observed in the supplemental assessment indicate the annualized standard deviation of the fund's returns is likely to remain lower in the future. The supplemental quantitative assessment suggests through the 12-month histogram that the distribution of fund returns aligned more closely with that of the zero- to one-year reference index, and we believe this pattern of volatility is likely to continue. When coupled with a change in a portfolio risk assessment indicator or management assessment indicator, the preliminary FVR typically recommended by the analyst is 'S1+', reflecting this forward view of volatility of returns supported by a change in strategy or management's likelihood of decreasing the forward volatility of returns, as evidenced in the supplemental assessment.

48. In the primary assessment, the line plot of historical return volatility of a fund denominated in U.S. dollars with target maturity of one to three years closely matches the historical return volatility of the reference index associated with one- to three-year maturities of U.S. government securities. However, the plot shows in recent months the annualized standard deviation of the fund's monthly returns slightly exceed that of the reference index. In the supplemental analysis, the 12-month histogram indicates the fund's distribution of fund returns is consistent with than that of the reference index; however, there is one outlier fund return value outside those of the reference index. The manager indicates that the outlier return value resulting in the increased annualized standard deviation is reflective of a unique event, and there has been no change in investment strategy. The fund could have a preliminary FVR of 'S1' based on the observations in the primary assessment, and if the outlier observed in the supplemental assessment was due to an isolated event, there is no change in investment strategy, and the manager intends to continue managing the fund in a manner consistent with past performance. In this case, the annualized standard deviation of the fund's returns is not likely to increase in the future. The supplemental quantitative assessment suggests through the 12-month histogram that the one-off event results in a distribution of fund returns aligned more closely with that of the three- to seven-year reference index. The preliminary FVR typically recommended by the analyst is 'S1', reflecting this forward view of volatility of returns, which is that we expect no change in volatility, and this is supported by the manager's affirmation that there has been no change in strategy.

D. Reference, Benchmark, And Proxy Indices

49. In these criteria we refer to reference indices, proxy indices, and benchmark indices. They are defined as follows:

50. ***Reference index.*** A domestic or regional index composed typically of government securities or other similar instruments that reflect the lowest volatility of returns relative to other debt instruments at similar maturities. The reference index is denominated in the same currency as the fund seeking an FVR and is determined by S&P Global Ratings.

51. ***Proxy fund.*** A proxy fund is a fund that exhibits a similar investment strategy (e.g., similar credit quality, sector exposures, and maturity) to a fund to which we assign an FVR. In the absence of sufficient historical monthly return information for the fund to which we assign an FVR, we may use as a substitute the historical monthly return information of a proxy fund to apply our quantitative assessment. Examples of funds that could qualify as proxy funds

include:

- An existing fund of the investment manager managed by the same portfolio manager or team in charge of the fund to which we assign an FVR;
- A fund managed by the same portfolio manager or team while employed at another fund provider during the period of time applicable to the quantitative assessment;
- A rated fund we identify as having a similar investment strategy and managed by another fund provider.

52. ***Fund's designated benchmark (benchmark index).*** A fund's designated benchmark is an index used as a standard for performance comparison and portfolio construction and is referenced as such in the prospectus or in the investment guidelines of the fund to which we assign an FVR. The underlying assets of the fund's designated benchmark generally reflect the credit quality, sectors, and maturity in which the fund invests. In the absence of sufficient historical monthly return information for a fund, we may apply the historical monthly return information of the fund's designated benchmark to conduct our quantitative assessment. The fund's designated benchmark would generally be identified by the investment manager of the fund to which we assign an FVR.

53. Each reference index, as described above, is denominated in the same currency as that of the fund and is populated with government securities that reflect the currency's sovereign. For example, a euro-denominated fixed-income fund's reference index will be euro denominated and reflect the market weighted mix of sovereign issuers that are members of the European Monetary Union or eurozone. The choice of reference indices is based upon the currency of the fund and then based upon the maturity band of the reference index that best reflects the fund's volatility of returns. In another example, if the fund is denominated in U.S. dollars, the reference index is U.S. dollar denominated and composed of U.S. government securities. In an atypical example of a European bond fund being U.S. dollar denominated, the volatility of the fund will reflect the volatility of European fixed-income investments converted to U.S. dollars, the fund's base currency, and will be compared with a reference index of U.S. dollar-denominated U.S. government securities.

54. Reference indices are not only denominated in the currency of the fund, but also are specific to certain maturity bands. We focus on maturity as a proxy for duration. While some long-dated securities have floating rates, and shorter duration, the government securities in the indices are not typically floating rate. Maturity bands typically reflect higher return volatility when they are populated by longer maturity securities because the longer maturity securities are increasingly sensitive to changes in interest rates and changes in credit spread. The maturity bands have overlap at the boundaries and this reflects the indices that we observe. For example, the 'S1' and 'S2' indices may each have three-year maturity securities. We generally propose to use, where possible, maturity bands as described in table 1.

55. Sometimes governments do not issue securities in a particular maturity band. For example, some governments may not issue securities whose maturity is less than one year. For those countries, 'S1+' rated funds are assessed relative to deposit rates whose time to maturity is less than or equal to one year when a reference index of short-maturity government securities is not present in a market.

56. We differentiate reference indices by maturity to provide market participants with recognized references to calibrate the risk level in their specific bond markets. We expect volatility of returns to be lowest for the maturity bands of zero to one and one to three years, higher for the maturity band of three to seven years, still higher for seven to 10 years, and highest for more than 10 years. A fund's maturity targets may not match the reference index we select for the

preliminary FVR. For example, if a fund has an investment portfolio target maturity of one to three years but exhibits volatility of returns more in line with the reference index whose maturity band is seven to 10 years, the preliminary FVR is 'S3', unless the histograms suggest a higher or lower preliminary FVR.

IMPACT ON OUTSTANDING RATINGS

57. The criteria, assuming no portfolio changes, are anticipated to result in changes to approximately one-fifth of fund volatility ratings. We anticipate we will raise half of the affected ratings by one category and likely lower half of the affected ratings by one category. We expect most rating changes to be caused by a reassessment of the portfolio risk. We intend to complete our review of issuers affected within the next six months.

RELATED CRITERIA AND RESEARCH

Retired Criteria

- Fund Volatility Rating Criteria, Feb. 2, 2007

Related Criteria

- S&P Global Ratings' National And Regional Scale Mapping Tables, June 1, 2016
- National And Regional Scale Credit Ratings, Sept. 22, 2014
- Methodology: Updated Fund Credit Quality Ratings Criteria For Counterparty Transactions, July 22, 2011
- Australian And New Zealand Fund Credit Quality Ratings Criteria, July 20, 2009
- Fund Credit Quality Rating Criteria, Feb. 7, 2007
- Treatment Of Credit Default Swaps, Jan. 17, 2007

Related Research

- RFC Process Summary: Fund Credit Quality Ratings Methodology And Fund Volatility Ratings Methodology, June 26, 2017
- S&P Global Ratings Definitions, June 26, 2017

These criteria represent the specific application of fundamental principles that define credit risk and ratings opinions. Their use is determined by issuer- or issue-specific attributes as well as S&P Global Ratings assessment of the credit and, if applicable, structural risks for a given issuer or issue rating. Methodology and assumptions may change from time to time as a result of market and economic conditions, issuer- or issue-specific factors, or new empirical evidence that would affect our credit judgment.