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Consultation Paper No. CP-16-005 on the request to EIOPA for further technical advice on the identification and calibration of other infrastructure investment risk categories i.e. infrastructure corporates

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Table of Contents

Responding to this paper

EIOPA welcomes comments on the Consultation Paper on the request to EIOPA for further technical advice on the identification and calibration of other infrastructure investment risk categories i.e. infrastructure corporates.

Comments are most helpful if they:
- respond to the question stated, where applicable;
- contain a clear rationale; and
- describe any alternatives EIOPA should consider.

Please send your comments to EIOPA in the provided Template for Comments, by email cp-16-005@eiopa.europa.eu, by 16 May 2016.

Contributions not provided in the template for comments, or sent to a different email address, or after the deadline will not be processed.

Publication of responses

Contributions received will be published on EIOPA's public website unless you request otherwise in the respective field in the template for comments. A standard confidentiality statement in an email message will not be treated as a request for non-disclosure.

Please note that EIOPA is subject to Regulation (EC) No 1049/2001 regarding public access to documents and EIOPA's rules on public access to documents[1].

Contributions will be made available at the end of the public consultation period.

Data protection

Please note that personal contact details (such as name of individuals, email addresses and phone numbers) will not be published. They will only be used to request clarifications if necessary on the information supplied.

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[1] Public Access to Documents

1. Introduction

1.1. Background

1.1. On 14 October 2015, the European Commission issued a call for advice[2] to EIOPA for further technical advice on the identification and calibration of infrastructure investment risk categories in Commission Delegated Regulation (EU) 2015/35 supplementing Directive 2009/138/EC (Solvency II) (hereinafter "Delegated Regulation").

1.2. This request follows a previous call for advice on the topic of infrastructure, the response to which was submitted to the Commission on 29 September 2015 (hereinafter "first call for advice"). In that response, EIOPA proposed a more granular treatment of debt and equity investments in qualifying infrastructure projects, which are financed using a special purpose vehicle (SPV) structure.[3]

1.3. Based on EIOPA's advice, on 30 September 2015 the Commission adopted an amendment to the Delegated Regulation.[4]

1.4. With the latest call for advice, EIOPA has been asked to further consider the evidence regarding the treatment of infrastructure corporates.

1.2. Scope of the call for advice

1.5. The Commission requested that EIOPA's advice cover the following main tasks:

- Define criteria or classifications to identify safer debt or equity investments in infrastructure corporates with or without an External Credit Assessment Institution (ECAI) rating.
- To advise on appropriate calibrations for such investments:
  - Either based on the Delegated Regulation amendment of 30 September 2015 (i.e. the first call for advice).
  - Or based on new asset categories.
- To provide a rigorous framework for insurers performing due diligence.

1.6. The Commission also requested that the advice include a cost-benefit analysis.

[2] Call for advice on infrastructure corporates
[3] Infrastructure final advice September 2015
[4] Amendment to Delegated Regulation

1.3. Previous work by EIOPA in relation to the treatment of infrastructure corporates

1.7. EIOPA's aim during the first call for advice was to identify a category of infrastructure investments for which a different treatment[5] within the Solvency Capital Requirement (SCR) standard formula could be prudentially justified based on the evidence. During the course of the analysis EIOPA considered the different types of infrastructure financing, including via corporate entities. EIOPA was aware of evidence relating to the performance of corporate financing, but EIOPA judged that the evidence to support a different treatment for infrastructure investments via project finance structures was more convincing.

1.8. In response to the consultation paper issued as part of the first call for advice (EIOPA CP 15/004), EIOPA received representation from various stakeholders that infrastructure corporates have lower volatility and higher recovery rates compared to corporate bonds in general, as well as that a similar level of protection to investors in project finance structures could be provided, for example via the use of covenants.[6] EIOPA considered these comments, but had a number of reservations regarding infrastructure corporates. In the Final Report to CP 15/004, EIOPA stated that:

> *EIOPA has considered the comments received and would acknowledge that there is some evidence that "infrastructure corporates" have performed better than other types of corporates. However, the evidence is much less convincing than for infrastructure projects. In addition, as stated in the consultation paper, there are delineation problems regarding the ability of corporates to enter into other business activities besides infrastructure. EIOPA does not consider that the proposals received from stakeholders adequately address this challenge.*
>
> *Therefore, bearing in mind EIOPA's deadline for delivering its advice to the European Commission, EIOPA has decided to not advise for the inclusion of "infrastructure corporates" within the scope of qualifying infrastructure. Nevertheless, EIOPA expects to consider this issue further in the medium-term as part of its monitoring of the appropriateness of the SCR standard formula.*[7]

1.4. Process followed by EIOPA

1.9. The work conducted on infrastructure previously had not focused on corporates. EIOPA therefore considered that it was important to engage further with stakeholders in order to identify all potentially relevant quantitative and

[5] Prior to EIOPA's advice, the Solvency II standard formula did not contain a specific treatment or module for infrastructure investments and therefore such investments would normally have been treated as an equity investment, or as a corporate bond or loan.
[6] With respect to the evidence for infrastructure corporates see Annex I to EIOPA CP 15/004
[7] Final Report CP15/004

qualitative information, as well as to benefit as much as possible from their expertise. EIOPA is also conscious of its duty to conduct open public consultations on its work.

1.10. As a first step, between 19 November and 10 December EIOPA issued a call for evidence to request information on the nature and risk profile of infrastructure corporates and in particular any empirical evidence regarding their performance.

1.11. EIOPA received comments from seven respondents (including confidential comments). The respondents provided predominantly qualitative information covering:

- The different types of financing structures for infrastructure and in particular the rationale for a corporate rather than SPV structure being used.
- The different types of corporates ranging from those which are essentially multiple projects to those which are mature, diversified companies.
- The types of restrictions in financing arrangements or regulations that investors consider provide a better risk profile than non-infrastructure corporates.

1.12. As part of their comments, some respondents provided specific drafting suggestions regarding how the qualifying criteria for infrastructure projects would need to be amended to allow suitable corporates to qualify.

1.13. EIOPA discussed the issues with its Insurance and Reinsurance Stakeholder Group (IRSG). EIOPA also held a Roundtable event on 12 February with key stakeholders representing insurers, asset managers, and industry associations to discuss the analysis conducted and initial proposals.

1.14. EIOPA is aware of the importance of this work in relation to the Commission's Action Plan on Capital Market's Union (CMU). Bearing this in mind, this public consultation will run for around a month with a view to EIOPA delivering its final advice to the Commission by the end of June. EIOPA also intends to hold another event with stakeholders around the end of May to discuss the outcome of the public consultation.

1.15. Some further work is necessary prior to the delivery of the final advice, for example regarding the analysis of bond spreads for longer maturities and of market data for other listed assets. Therefore, in some areas EIOPA is not yet able to provide a recommendation, or is only able to provide a very preliminary one. Nevertheless, it is still considered to be a valuable time to conduct a public consultation in order to receive feedback on the general approach, calibration methodology and the proposed qualifying criteria. EIOPA will continue to work on these areas during the public consultation and before the planned deadline of June.

1.16. Overall EIOPA has sought to strike an appropriate balance between timely delivery and adequate consultation with stakeholders.

1.5. Structure of the consultation paper

1.17. The consultation paper includes the analysis performed by EIOPA and the draft findings and proposals. Chapter 2 is a summary of the preliminary results. Chapter 3 describes some of the arguments that are often made regarding the lower risk profile of infrastructure investments. Chapter 4 considers the differences between infrastructure corporates and infrastructure projects. Chapters 5-7 discuss whether a new calibration for infrastructure corporates can be derived and how this could be done. Chapter 8 evaluates the scope and criteria that could be used to identify suitable infrastructure corporate investments. Chapter 9 considers whether the scope and criteria of EIOPA's previous advice on infrastructure projects can be revised to allow some types of infrastructure corporates to qualify. Chapter 10 analyses risk management requirements for infrastructure projects and infrastructure corporates.

2. Summary of analysis conducted and preliminary results and conclusions

1.18. The differentiated treatment within the SCR standard formula that EIOPA recommended as part of the first call for advice was based on data for infrastructure projects financed according to an SPV model. The types of corporates that stakeholders consider also warrant a differentiated treatment within the standard formula can have a different risk profile to projects. EIOPA therefore considers that the extension of the risk charges for qualifying infrastructure projects to infrastructure corporates is not straightforward and requires a sound prudential justification based on the available data.

1.19. EIOPA has therefore undertaken the following tasks:

- Identified and analysed the available equity price and spread data for infrastructure corporates.
- Assessed how representative this data is for infrastructure corporates in general bearing in mind that a significant part of the infrastructure investment asset class is not financed via public listings.
- Identified and analysed other potentially relevant material, for example studies by rating agencies and academics.
- Based on the results of the above analysis, developed qualifying criteria that could be used for a new asset class of infrastructure corporates.
- Evaluated whether the scope and criteria for infrastructure projects can be revised to allow some types of infrastructure corporates to qualify, which are similar to projects and have an equivalent level of risk.
- Reviewed the applicability of the risk management requirements recommended for infrastructure projects.

1.20. The preliminary results and conclusions that EIOPA has drawn from the above analysis are outlined the following paragraphs.

Treatment of infrastructure corporate equity

1.21. The analysis of equity price data, primarily the analysis of a selection of relevant infrastructure corporates, indicates that the current standard formula risk charge could be reduced for listed and unlisted equity in infrastructure corporates, but should be higher than the 30 % for infrastructure projects in the Delegated Regulation amendment of 30 September 2015. The empirical value-at-risk (VaR) 99.5% based on 12-month returns between 2000 and 2015 for a portfolio of selected infrastructure corporates is close to 36 %. Based on the historical behaviour of these selected entities, EIOPA considers that the results support a risk charge of 36 % for (listed and unlisted) equities, provided that a number of criteria are met, which identify the relevant risk characteristics.

Treatment of infrastructure corporates debt

1.22. For the iBoxx EUR and GBP Utilities indices the spreads were significantly less volatile than for indices of non-financial and financial corporates, which EIOPA

constructed to be comparable in terms of duration and rating. The comparison of the spreads of relevant infrastructure corporate bonds selected by EIOPA and corresponding non-infrastructure bonds yielded similar results. However, in the latter case further analysis is necessary to understand the impact of different maturities and the composition of the non-infrastructure bonds selected (in particular the proportion of financial and non-financial corporates).

1.23. EIOPA devised an approach to compare the annual changes in the spreads of the iBoxx Utilities indices with the maximum changes implied by the standard formula. Although the methodology has a number of limitations, the results would appear to show that for each day between October 2007 and December 2007 the spread changes in the subsequent 12 months surpassed the maximum level implied by the standard formula. This might be an indication that the spread risk for utility bonds is not better than implied by the standard formula.

1.24. In summary, the analysis showed that the spreads of selected infrastructure corporate bonds were less volatile than those of non-infrastructure corporate bonds used for comparison. However, EIOPA would need to conduct further analysis prior to June before a sound judgment can be made on whether the spread risk of infrastructure corporate debt differs from the one implied by the standard formula.

Potential scope of an infrastructure corporate asset class and qualifying criteria

1.25. New criteria have been developed to ensure that only those equity investments in infrastructure corporates, which exhibit a similar risk profile to the entities used for the purpose of the calibration analysis, can qualify for any revised risk charges. These criteria are less detailed than the criteria for infrastructure projects, but cover a number of similar risk elements including the predictability of the cash flows and the financial structure. These criteria could apply to investments in infrastructure corporate debt with an ECAI rating, depending on the final result of the analysis of bonds. In case the analysis should justify a different treatment of bonds with an ECAI rating, EIOPA will consider the desirability and feasibility of developing criteria that would allow infrastructure corporate debt without an ECAI rating to qualify.

Scope and criteria for infrastructure projects

1.26. Based on further analysis and discussion with relevant stakeholders, EIOPA would propose to change the scope of the infrastructure project asset class by removing the restriction to SPV financing. This is intended to allow "project-like" corporates to qualify for the risk charges of infrastructure projects according to the Delegated Regulation amendment of 30 September 2015. EIOPA believes that the other qualifying criteria should remain fundamentally the same in order to provide for an equivalent level of risk and quality of investment. Some changes are proposed to the requirement regarding the security package to recognise some alternative arrangements that still provide a high degree of protection to investors.

Risk management requirements

1.27. EIOPA continues to consider that the risk management and due diligence requirements are suitable for infrastructure projects despite some changes to the scope. Since infrastructure corporates can present similar risk management challenges, some of the requirements should also be applied to infrastructure corporates. However, where the risk management requirements are directly linked to the requirements for projects, for example for a validation process of the financial model, these are not applicable to corporates.

3. The case for infrastructure

1.28. It is often argued that infrastructure investments represent lower risk than other corporate exposures[8]. Some of the common features of infrastructure that are often cited as leading to this asset class being safer are that:

- They can be regulated businesses or at least there are high barriers to entry and limited competition.
- The long-term contracts can provide stability and greater predictability of cash flows.
- Partnerships with government and local authorities can provide investor guarantees as well as expertise.
- There is greater stability of dividends, lower default rates and higher recovery values.
- Those investors that engage in such investments have specialised expertise.
- Legal structures can be stable over time, for example due to contractual or regulatory covenants restricting certain activities or changes.

1.29. There are also those who advocate that infrastructure can be particularly suited to insurers on the basis that:

- It can provide the opportunity to diversify away from other assets in the portfolio (e.g. from non-infrastructure corporate bonds).
- Long-term assets can support asset-liability matching strategies.
- Infrastructure provides a relatively low credit risk alternative to government bonds.
- Infrastructure can be seen as more defensive compared to general corporates.
- There is evidence that infrastructure has lower volatility than non-infrastructure equity.

1.30. Another point made is that infrastructure investments should not be limited only to the larger insurers who may have greater resources or expertise since:

- Smaller insurers can still have niche knowledge in certain sectors linked to their product or underwriting portfolio.
- There are increasing opportunities to invest via professionally managed funds.

1.31. However, whilst the above assertions are for the most part plausible, relatively limited quantitative analysis has been conducted to substantiate these arguments, and it is therefore difficult to quantify their impact for the purposes of a Solvency II calibration.

[8] See for example Frédéric Blanc-Brude, *Towards efficient benchmarks for infrastructure equity investments: A review of the literature on infrastructure equity investment and directions for future research* (France/Singapore/United Kingdom: EDHEC-Risk Institute, 2013).

4. What is the difference between infrastructure projects and corporates?

1.32. Stakeholders have argued that the risk of an infrastructure corporate is not necessarily different from the risk of an infrastructure project. On this basis, it is claimed that the same calibration should be used and the qualifying criteria for projects should be amended to allow for infrastructure corporates.

1.33. EIOPA understands that there are a range of different types of corporates. It is possible to represent this as a range or scale; on one side of the scale would be corporate structures which are very similar in substance to a project with one example being two "projects" within a corporate structure rather than a single SPV; on the other side of the scale would be large, diversified, very well-established corporates, which may also have material business that according to most definitions would not constitute infrastructure activities (e.g. trading of commodities that are used for the infrastructure, or the operation of some transport services). EIOPA considers that as one moves along this scale, the risk profile changes and increasingly deviates from the risk profile of infrastructure projects.

1.34. One source of a different risk profile is the security package. According to the Moody's study on infrastructure corporates the recovery rate for senior secured infrastructure issues was 75% while the corresponding value for senior unsecured issues was 57%.[9] This seems to indicate the positive effect that security – which is more frequent for projects than for corporates - can have. Protective covenants also exist for infrastructure corporate debt, and it is recognised that a reason why investors may be willing to accept a weaker security package may be a lower perceived overall risk (e.g. due to stable cash flows and diversification). However, the greater the extent to which the security is weakened compared to infrastructure projects, the less clear it becomes that the same calibration as for projects is still appropriate.

1.35. Another reason for differences can be that certain types of underlying assets and revenue mechanisms are more frequent in project finance than in corporate finance and vice versa. For example, social infrastructure with contracted revenues is often financed via projects. In this case, it is not the governance or legal structure that is the cause of the difference, but the effect is still that in general infrastructure corporates have a different risk profile.

1.36. Different degrees of diversification can also result in a different risk profile. Infrastructure corporates will generally have more diversified revenues in terms of activities, customers and geography.[10]

[9] Moody's Investor Service, *Infrastructure Default and Recovery Rates, 1983-2014* (March, 2015), 20.
[10] It is worth mentioning that the calibration for infrastructure projects proposed by EIOPA assumed a diversified portfolio of projects.

1.37. Differences in risk can also result from the exposure to construction risk. For projects the construction phase is associated with a higher risk of default. In contrast, infrastructure corporates often have established operations.

1.38. Infrastructure corporates may have greater flexibility in decisions over incremental investment to cope with a proven increase in demand, whereas a project requires a minimum critical business volume to make it viable. However, one may doubt whether this flexibility translates into lower risk over a 12-month period. In addition, higher managerial discretion may not always produce beneficial results.

1.39. In summary, whilst the differences between the risk profile of projects and corporates may not be directly linked to the different legal structures, there are some key areas of difference that affect the nature of the risks. Arguably, these differences could result in a lower or a higher risk for infrastructure corporates compared with infrastructure projects. Quantifying the effects of these differences is very difficult without further quantitative analysis. Therefore, except for the limited number of cases where corporates may be very similar to projects, EIOPA considers that the most suitable approach to derive a calibration for infrastructure corporates is to do so "directly" with reference to data for infrastructure corporates, instead of making reference to the project calibration. Fortunately, there is meaningful market data on the risk characteristics of infrastructure corporates, which is discussed in the Chapters that follow.

5. Analysis of the risk profile for infrastructure corporate equity and debt

5.1. Introduction

1.40. Compared with infrastructure projects there is more information available in the form of prices of bonds issued by infrastructure corporates and prices for listed equities. An additional source of data is the Moody's study on infrastructure corporates. Further quantitative information can be found in studies on other relevant performance measures for infrastructure investments like cash flows, revenues and profits.

5.2. The approach chosen for the analysis

1.41. The Solvency II framework quantifies risk in terms of the 12-month volatility of basic own funds measured based on market values[11]. Therefore, it is considered to be most appropriate to focus the analysis as far as possible on the prices of traded equities and bonds. Compared with infrastructure projects there is a large amount of such data available. The approach that EIOPA has followed is to use infrastructure corporates with listed equities and quoted bonds as proxies for the risk of infrastructure corporates in general or of particular sectors.

1.42. Based on discussions with the insurance industry, EIOPA understands that insurers are interested mainly in private, non-traded investments. Although quantifying risk based on the 12-month variations in market prices is fully in line with the Solvency II framework, stakeholders argue that the infrastructure corporates for which market prices are available differ in relevant risk characteristics from private, non-traded investments.

1.43. In principle the (short-term) risk of an entity should not depend on whether it is listed or not. However, there may be systematic differences between listed and unlisted entities. Listed entities will generally be larger, normally with a diversified revenue basis, and more mature. They may also be less leveraged than privately held investments.

1.44. Nevertheless, EIOPA believes that there are a number of convincing arguments why the corporates selected for the calibration can represent an adequate proxy:

- The main argument put forward for a better risk profile of infrastructure investments is the greater stability of the cash flows. The vast majority of the entities used for the calibration seem to benefit from "protected" revenues due to contractual arrangements, regulation or the fact that they provide essential services combined with barriers to entry. Therefore, EIOPA would deem them to be representative for a larger set of infrastructure corporates with similar characteristics.

[11] Article 101 (3) second sub paragraph of Directive 2009/138/EC

- The first argument applies in particular for utilities, which represent the large majority of entities used for the calibration. The utilities active in energy transmission and distribution, as well as the provision of water and wastewater services are often subject to a rate-of-return regulation. Integrated utilities may also derive a part of their revenues from these activities. In addition, their non-regulated activities benefit from some protection due to barriers to entry.
- Stakeholders often point to the results of the Moody's study as evidence for a better risk profile of infrastructure corporate bonds and loans in general, and that this should be the primary basis of any Solvency II calibration. At the end of 2014 utilities represented roughly two-thirds of the corporate infrastructure securities that Moody's rated.[12] If the alleged lower fundamental credit risk of infrastructure corporate debt has an impact on the spread volatility this should be reflected in the spreads of the utility bonds EIOPA has used for its analysis.
- All the sectors that stakeholders deemed to be relevant according to the call for evidence responses such as airports, UK water utilities and energy generation, transmission and distribution are represented in the list of entities used for the calibration.
- Some of the potential systematic differences between investments in private compared to public companies like stronger covenants providing greater investor control, and ideally a better understanding of the transaction by the investor may improve the medium to longer term risk profile. However, they do not necessarily translate into lower short-term risk. In addition, the entities which EIOPA selected for the calibration benefit on average from a higher degree of diversification in terms of geography or activities.

1.45. EIOPA is also not aware of better alternatives. A possible solution could be to identify suitable entities and to derive the calibration based on other variables or quantities that may be relevant for the variation in their market prices, such as the volatility of cash flows, revenues or profits. However, there are significant challenges; first regarding access to such data which is sufficiently representative and reliable; second and probably most crucially the difficulty to derive a methodology that provides a reliable connection between market values and these other measures of risk based on cash flows or accounting variables. EIOPA has asked stakeholders for proposals in previous consultations on infrastructure, but so far no satisfactory approach has emerged. Therefore, this information can only be used as supporting qualitative evidence.

1.46. For the reasons provided above, EIOPA considers the use of corporates with listed equities or traded bonds for the calibration as the most suitable approach.

[12] Moody's, *Infrastructure Default and Recovery Rates*, 6. The figure in Exhibit 3 includes the categories "Regulated E&G Utilities and Networks", "Unregulated E&G Utilities and Power", "Water, Waste & Multi-Utilities" and "Other Utilities".

Question 1: unlisted assets

(a) Do you agree that in the absence of publicly available data on unlisted infrastructure assets; the data on listed entities analysed by EIOPA are an appropriate proxy?

(b) If not, please provide a comprehensive justification and supporting evidence, including data, International Securities Identification Numbers (ISIN) codes and examples.

5.3. Methodology chosen for the analysis

1.47. For **equities**, the listed entities selected as proxies allow the analysis to be based on the methodology that was used by CEIOPS for the calibration of the equity risk sub-module.

1.48. For **debt**, the approach is reasonably straightforward given the meaningful amount of spread data for infrastructure corporates that is available. This makes it unnecessary to infer the spread volatility based on other quantities. This was done during the first call for advice, in the form of the "credit risk approach", to compensate for the lack of spread data for infrastructure project debt. Information on default and recovery rates can still be useful as supporting evidence.

1.49. One might argue that the "credit risk approach" should also be used for infrastructure corporates on the basis that the entities covered in the Moody's study are closer in risk profile to the infrastructure investments insurers are interested in, than the corporates for which spread data is available. Yet, a considerable overlap between the entities in the Moody's study and the corporates that EIOPA has used for the calibration can be expected as an external rating is often a prerequisite for accessing public debt markets. The use of data derived from non-European entities (e.g. US utilities) has limitations given the large differences in the (regulatory) environment. Therefore, EIOPA is not convinced that the entities underlying the Moody's study are more representative in their risk profile than the infrastructure corporates in the sample of bonds analysed by EIOPA.

1.50. While it was not seen as the preferred option, EIOPA identified in the first call for advice the "liquidity approach" as a way to reflect the illiquidity and generally long-term nature of infrastructure project debt. However, that advice also clearly underlined the drawbacks of the approach. Although some of the arguments for the liquidity would also apply in theory for infrastructure corporates, EIOPA would advise against an expansion of the liquidity approach beyond infrastructure project debt or "project-like" corporates.

6. Analysis of the risk profile for equity investments in corporates

6.1. Analysis of existing infrastructure equity indices

Introduction

1.51. The first element of the analysis was to look at readily available data in the form of equity indices for both the infrastructure sector as a whole and individual sectors. This provides some insights into the risk profile of listed infrastructure equities.

1.52. There have been a number of studies on the behaviour of infrastructure equities including equity indices.[13] The main difference between these studies and the analysis below is the use of a risk measure that is in line with the Solvency II framework.

Selected indices

1.53. The following infrastructure indices were selected:

- Global infrastructure indices:
  - MSCI World Infrastructure USD (M2WO0INF Index)
  - S&P Global Infrastructure Index USD (SPGTIND Index)
  - Dow Jones Brookfield Global Infrastructure Index USD (DJBGI Index)
- Sector indices:
  - MSCI Europe Utilities Sector Index EUR (MXEU0UT Index)
  - MSCI World Utilities Sector Index USD (MXWO0UT Index)

1.54. The global indices were selected because they are often used to assess the performance of infrastructure corporates and represent a wide range of infrastructure sectors. The only relevant sector indices were considered to be the ones covering utilities.

Results of the calculation

1.55. Below the empirical VaR 99.5% based on 12-month returns and the maximum drawdown for the selected indices are shown (figures 1 and 2). The drawdown is helpful as additional information to assess the financial risks that investors are subject to. These risk metrics are then compared to the corresponding figures for the MSCI World Index (MXWO Index), which was used as an input to calibrate the type 1 equity risk charge in the Delegated Regulation.

1.56. Based on the data that EIOPA could access global infrastructure indices were analysed for the period 2002 to 2015 (figure 1) while the sector indices were analysed for the period 2000 to 2015 (figure 2).

[13] For a summary see Blanc-Brude, *Towards Efficient Benchmarks*, 37-46.

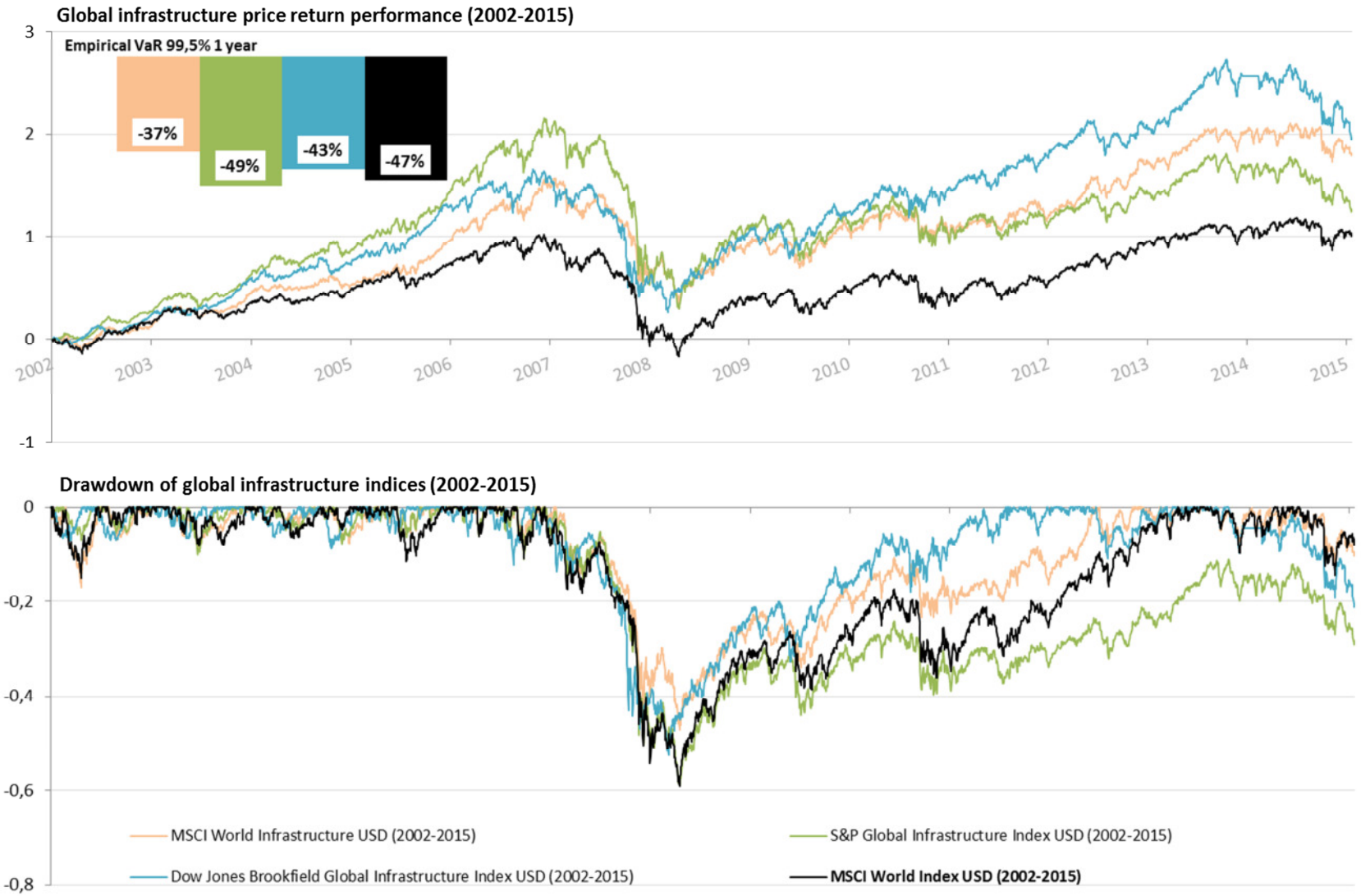

Figure 1: Price return performance and drawdown of global infrastructure indices (2002-2015) (Source Bloomberg)

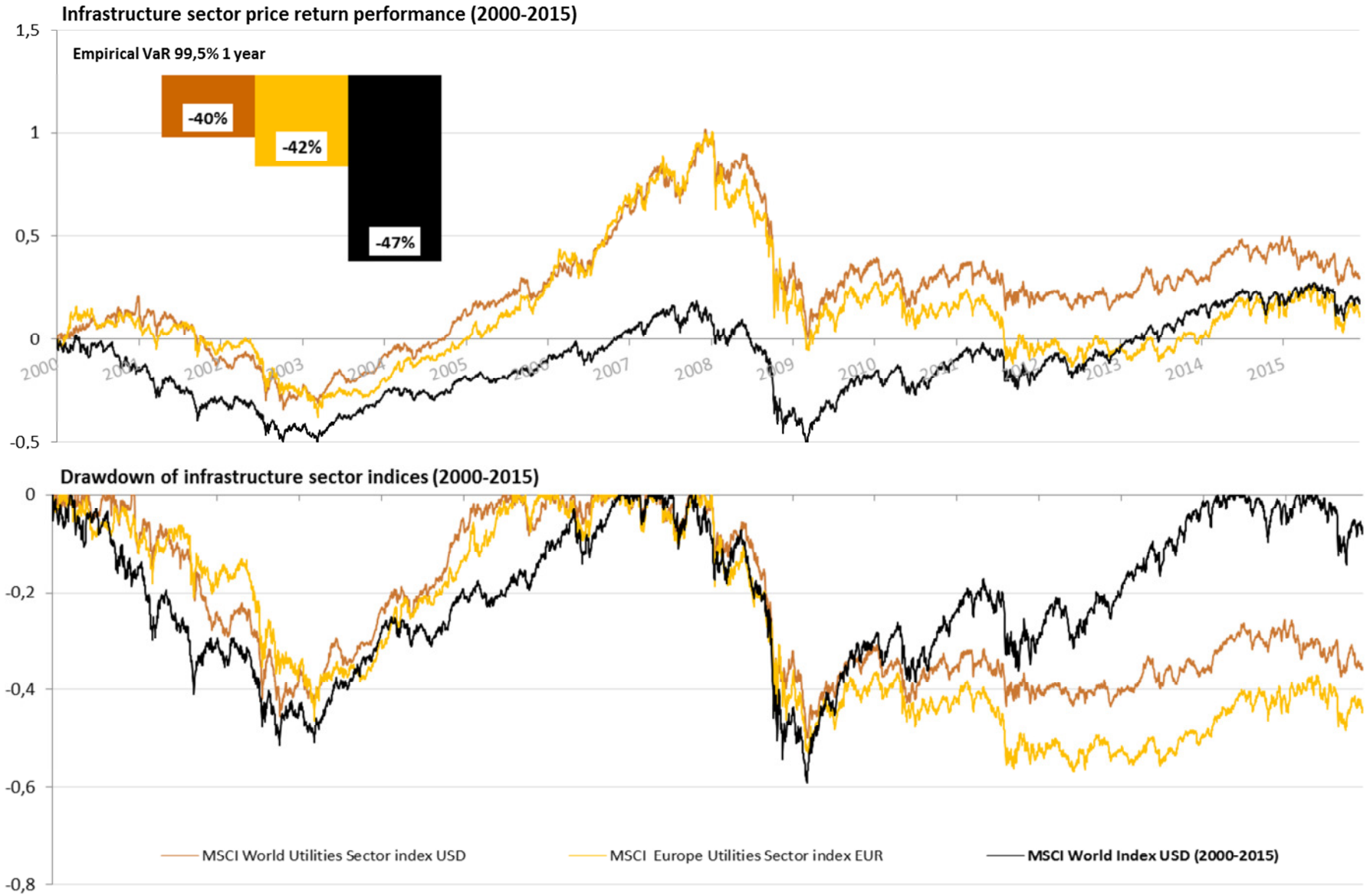

Figure 2: Price return performance and drawdown of infrastructure sector indices (2000-2015) (Source Bloomberg)

Analysis of the results

1.57. The results for the global infrastructure indices are mixed. While the risk for the S&P Global Infrastructure Index as measured by the empirical 99.5 % VaR was slightly higher than for the MSCI World, these figures are somewhat lower for the Dow Jones Brookfield Global Infrastructure Index and significantly lower for the MSCI World Infrastructure. This shows that the results are very sensitive to the composition of the indices. In terms of the drawdowns none of the three indices behaved significantly different in 2007 to 2009 than the MSCI World Index. In other words, during a time of financial stress the infrastructure corporates represented by the indices did not provide meaningful diversification.

1.58. The empirical 99.5 % VaR of the utilities indices was somewhat lower than for the MSCI World Index. In terms of the drawdowns the results are very similar to those for the broader infrastructure indices.

6.2. Analysis of a portfolio of listed infrastructure corporate equity

Introduction

1.59. The fixed composition of the infrastructure equity indices discussed in the previous section makes it impossible to analyse the risk of individual sectors or companies meeting certain criteria. Therefore, EIOPA selected a set of relevant infrastructure corporates to analyse the risk of a portfolio of these entities. The approach has some similarities to the one followed by Kaserer (2012)[14] and Blanc-Brude/Wilde/Whittaker (2016)[15]. EIOPA also benefited in its analysis from discussions with and data provided by Professor Blanc-Brude and Dr. Whittaker from the EDHEC Risk Institute and is grateful for their support.

1.60. EIOPA followed an "inclusive" approach. The idea was to identify European corporates which earn the vast majority of their revenues from infrastructure. Mere users of infrastructure (e.g. airlines) or corporates heavily involved in trading were excluded. In addition, entities which earn a meaningful part of their revenues from countries outside the EEA or OECD were not considered as respondents to the call for evidence did not indicate an interest in corporates active in these countries. The resulting list of entities in Annex III.

1.61. Table 1 below gives an overview of the composition of the portfolio in terms of the different infrastructure sectors.

[14] Christoph Rothballer and Christoph Kaserer, The Risk Profile of Infrastructure Investments: Challenging Conventional Wisdom, *The Journal of Structured Finance*, 18, no. 2 (Summer 2012): 95-109.
[15] Frédéric Blanc-Brude, Timothy Whittaker and Simon Wilde, *The performance of listed infrastructure equity: a mean-variance spanning approach* (Singapore: EDHEC-Risk Institute, 2016).

Sector	Number	Percentage
Utilities	36	51 %
Water	8	11%
Gas	8	11 %
Commercial services	6	7 %
Energy	5	8 %
Engineering and Construction	4	6 %
Transport	3	4 %
Environmental	1	1 %
Total	71	

Table 1: Breakdown of sectors included in the portfolio of listed infrastructure corporates

Analysing returns of the selected entities

1.62. Based on the selected entities a portfolio is constructed. This allows an analysis of the returns that an investor in these equities would earn.

1.63. The portfolio includes the thirty largest of the selected companies in terms of market capitalisation. The portfolio composition is revised every three months.[16] The daily value is defined as the portfolio value on the previous day multiplied by the market-weighted returns of the individual components. The weight of an entity at a given day is calculated as the entity's market capitalisation divided by the sum of the market capitalisation of all entities.

1.64. The market risk module has a separate sub-module for currency risk. In order to produce a calibration for the equity risk sub-module, it is therefore necessary to eliminate the effect of changes in the exchange rate to the extent possible. In order to address this issue, market values of entities not listed in EUR were converted into EUR by using a constant exchange rate which was determined as the historical average rate over the whole time period (i.e. 2000-2015).

Results of the analysis

1.65. Figure 3 shows the price returns for portfolio of listed infrastructure equity and the MSCI World Index as well as the maximum drawdowns between 2000 and 2015.

[16] In case market value weights are used the exclusion of entities with smaller market capitalisation does not have a material effect on the results. On average the 30 companies included in the index represented more than 96 % of the market capitalisation of all selected entities. The results with equal weights are discussed below.

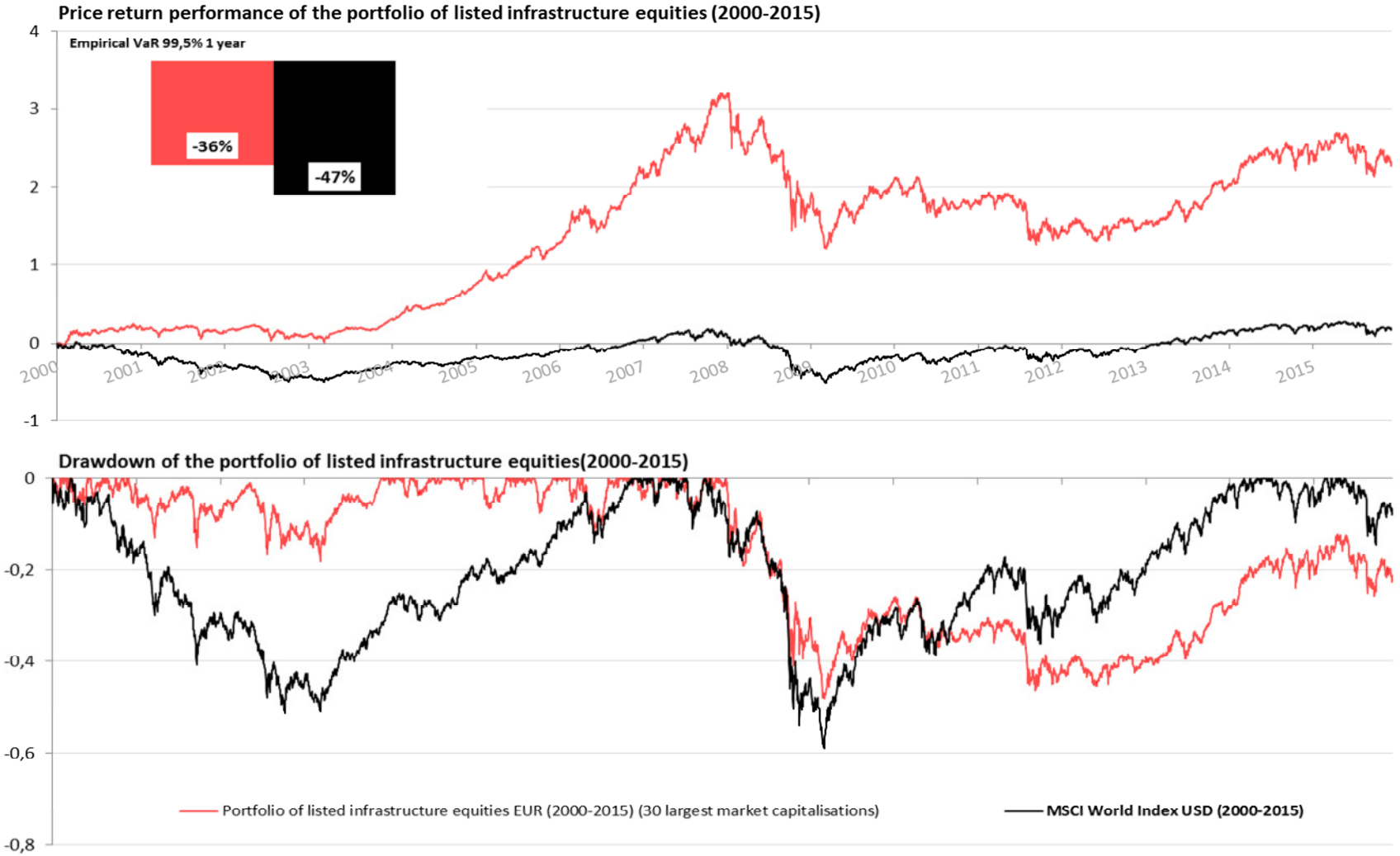

Figure 3: Price return performance and drawdown of a portfolio of listed infrastructure equities (2000-2015) (Source Bloomberg)

1.66. The empirical VaR 99.5% based on 12-month returns of the portfolio of selected infrastructure entities is roughly 36 %. This is somewhat lower than the type 1 equity risk charge and also lower than for the MSCI World Index.[17] The results if an equal-weighted infrastructure portfolio is used are not displayed but are very similar. Looking at the drawdown analysis, it seems that the infrastructure portfolio behaves similar to the MSCI World Index even though the infrastructure portfolio is less impacted by the decrease at the beginning of the 2000s, which may be the result of the exclusions of telecoms (see Section 8.2 "Determination of the scope").

1.67. The analysis of the dependencies showed an increasing 1-year correlation with the MSCI World Index up to 97% in times of severe financial stress. Figure 4 below displays the 1-year correlation over the full time period. The red bar indicates the average 1-year correlation during the financial crisis.

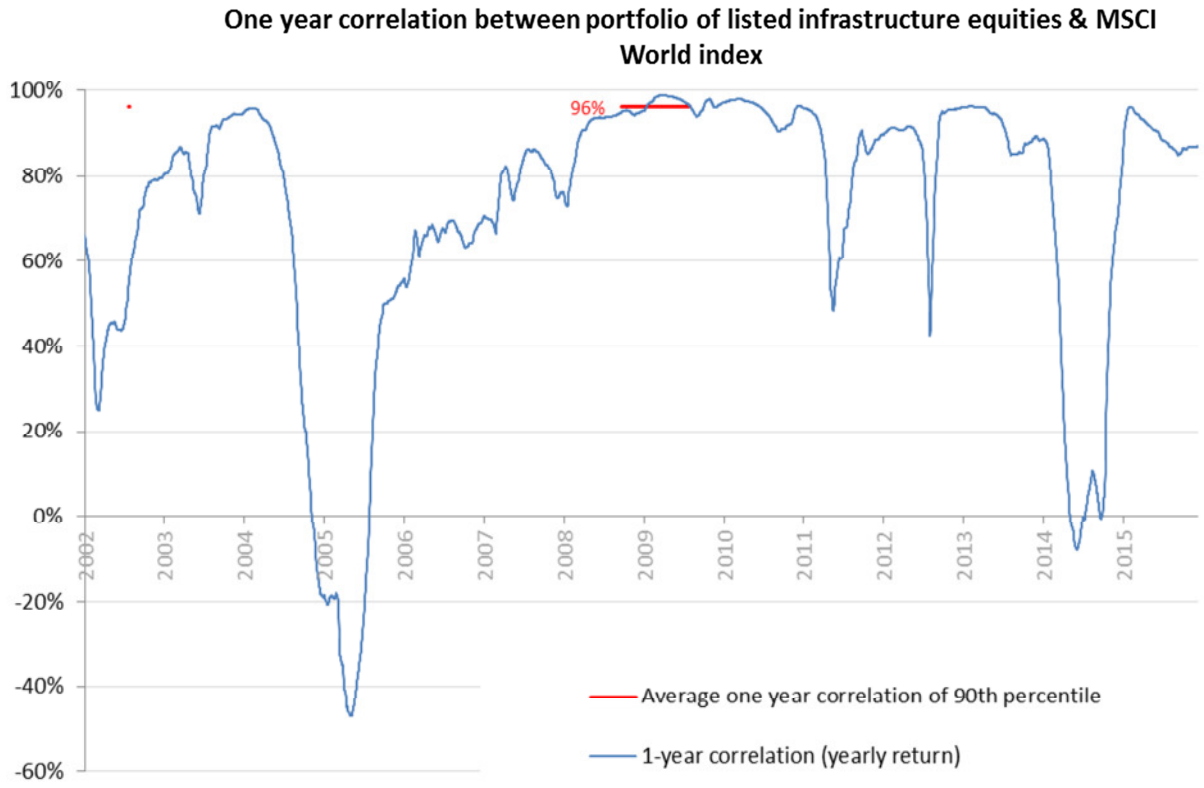

Figure 4: One year correlation between the infrastructure equity portfolio and the MSCI World Index (Source Bloomberg)

1.68. Further correlation analyses were conducted. It is 'based on "cutting out" adequate subsets of data pairs in order to obtain a measure of the tail correlation. Typically this involves a cut along various percentiles in each of the

[17] A part of the difference may be due to the different treatment of exchange rate fluctuations.

two variables'[18]. The 99,5th, 99th, 95th, 90th percentiles tail correlations are shown in Table 2.

	Tail correlations			
Percentile	**99,5th**	**99th**	**95th**	**90th**
Tail corr.	18.8%	42.5%	76.5%	89.5%

Table 2: Tail correlations of the infrastructure equity portfolio and the MSCI World Index

1.69. The light orange, dark orange, brown and green points in figure 5 below represent the data in the 99.5th, 99th, 95th and 90th percentiles for the infrastructure equity portfolio and the MSCI World Index respectively.

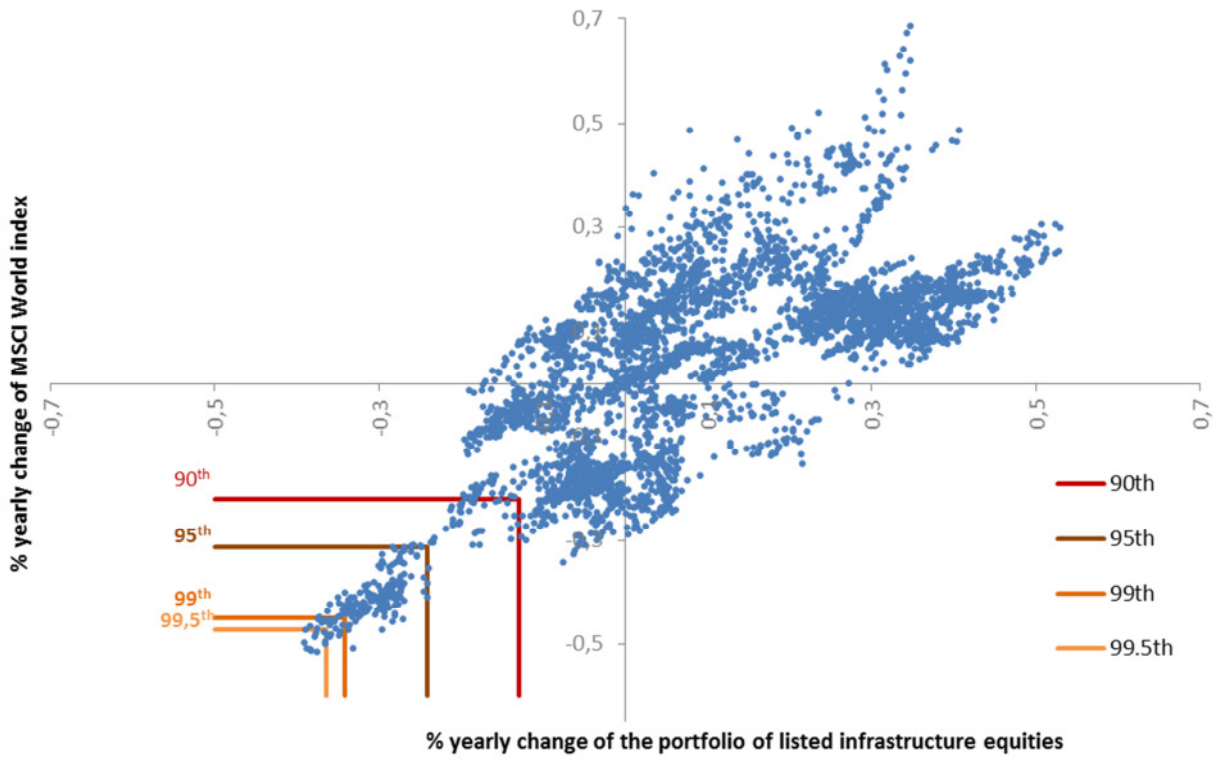

Figure 5: Dependence between percentage yearly returns of infrastructure equity portfolio and MSCI World Index in stress situations (Source Bloomberg)

[18] See page 16 of the following document

1.70. In addition, EIOPA looked at daily and monthly correlations. In order to come to a final conclusion further analysis is necessary. One approach that EIOPA will explore is to determine the correlation factor that would produce an adequate capital requirement for equity risk for a representative equity portfolio based on a historical simulation.

1.71. Based on the analysis so far the most likely outcome would be a treatment as type 1 (i.e. correlation of +1 with type 1 and +0.75 with type 2) or type 2 (i.e. correlation of +1 with type 2 and +0.75 with type 1).

6.3. Complementary analysis of several listed infrastructure funds

1.72. Stakeholders emphasised the greater control over the infrastructure entity as a crucial advantage of non-traded private transactions. A possible way to understand the effect of this control is to analyse the market prices of listed infrastructure funds (where the underlying assets are not traded).

1.73. Two such funds have so far been identified and analysed. The tail losses of these two listed funds for the periods between November 2010 and February 2016 and March 2007 and February 2016 were significantly lower than for a comparable index for the corresponding periods. However, there are inherent limitations due to the limited availability of data (for example one of the funds does not cover the financial crisis of 2008/2009) and the lack of adequate diversification within each portfolio. Individual assets in these funds may also not meet all qualifying criteria.

6.4. Evidence in terms of cash flows and revenues

1.74. In a 2013 paper, Professor Blanc-Brude summarised the then existing research and concluded that based on this research infrastructure private equity cash flows (and by inference dividends) are not less volatile than other private equity. The overall conclusion of that paper was that "substantial data reclassification as well as new data collection is needed".[19]

1.75. In a recent study Blanc-Brude et al. categorise 330 UK infrastructure firms as "contracted", "merchant" or "regulated". These groups are then compared with non-infrastructure corporates that are comparable in terms of size, leverage and profitability. One result is that the revenues and profits of the infrastructure firms in these categories are significantly less volatile than those of the comparable non-infrastructure corporates.[20]

[19] Blanc-Brude, *Towards Efficient Benchmarks*, 62
[20] Frédéric Blanc-Brude, Majid Hasan and Tim Whittaker, *Revenue and dividend payouts in privately-held infrastructure investments: Evidence from 15 years of UK data* (Singapore: EDHEC-Risk Institute, 2016).

1.76. These results could suggest a lower risk profile of infrastructure corporates **relative** to comparable non-infrastructure corporates measured on the basis of accounting quantities.

1.77. While these results are very interesting there are three limitations: Firstly, Solvency II measures risk in terms of the volatility of market prices. Secondly, the study covers only entities from one jurisdiction. Thirdly, the existing Solvency II calibrations for spread and type 1 equities were derived based on data for large companies. Therefore a comparison with these non-infrastructure firms would be more meaningful in the context of EIOPA's analysis.

1.78. EIOPA will further analyse the results. So far, no corresponding studies in terms of cash flows and revenues in the area of debt investments have been found.

6.5. Conclusions equity calibration

1.79. The results for the global infrastructure indices were inconclusive as two displayed lower risk than the MSCI World Index while the risk for the third one was higher. In terms of the drawdowns none of the three indices behaved significantly different than the MSCI World Index during the financial crisis.

1.80. For the two utilities indices the empirical 99.5 % VaR was somewhat lower than for the MSCI World Index, but they also did not provide meaningful diversification benefits between 2007 and 2009.

1.81. The empirical 99.5 % VaR for a portfolio of listed infrastructure equity was roughly 36 % with very similar results for the portfolio using an equal-weighted approach. During the financial crisis the entities selected in the infrastructure portfolio provided very limited diversification benefits.

1.82. In the period for which data was available the annual VaR of two listed funds which invest in infrastructure corporates was significantly lower than for a comparable index.

1.83. Based on the historical price behaviour of the portfolio of listed infrastructure equity, EIOPA considers that the results support a risk charge of 36 % for equities which meet a number of criteria.

1.84. Table 3 below provides a concise summary of the evidence that was collected and the conclusion drawn from it.

Source	Results	Limitations
Global infrastructure indices	• Inconclusive regarding empirical 99.5 % VaR and whether it is lower than the MSCI World Index • Drawdown not different from MSCI World Index	• Composition of indices covers a broader range of investments than EIOPA would consider to be suitable infrastructure sectors
Utilities indices	• Empirical 99.5 % VaR somewhat lower than for the MSCI World Index	• No meaningful diversification benefits between 2007 and 2009.
Portfolio of listed infrastructure equity	• Empirical 99.5 % VaR roughly 36 %	• Limited diversification benefits between 2007 and 2009.
Listed infrastructure funds	• Tail losses are lower than a comparable index	• Lack of representativeness of the underlying investments • The time period is very short and for one of the funds does not cover the financial crisis • Valuation of the funds may not reflect the risk bore by the underlying investment

Table 3: Summary of equity analysis

7. Analysis of the risk profile for debt investments in corporates

7.1. Introduction

1.85. In order to gain insight into the spread risk of infrastructure corporate bonds EIOPA assessed the spread behaviour of a portfolio of selected bonds (Sub-section 7.2). To complement this, the spread behaviour for the iBoxx Utilities indices was analysed (Sub-section 7.3). Further, data on default and recovery rates for infrastructure corporate debt was also evaluated (Sub-section 7.4).

7.2. Spread behaviour for a portfolio of selected infrastructure corporate bonds

1.86. EIOPA has not yet completed its analysis of the portfolio of selected infrastructure corporate bonds and will continue its work on this prior to the finalisation of the advice in June. So far, issuances denominated in currencies other than EUR as well as ratings other than AA, A and BBB have not been incorporated.

1.87. Due to copyright restrictions on the data used for the analysis, EIOPA is not able to publish more detailed information on the nature of the portfolio of infrastructure corporate bonds and the results of the analysis. In the section below a general description of the composition of the portfolio and the preliminary results are provided.

Selection of bonds

1.88. Most of the bonds included in the infrastructure portfolio come from the following sectors:

- Gas distribution
- Electric distribution, transportation and generation and non-electric utilities
- Transportation
- Health facilities

1.89. The same criteria that were used for the selection of the corporates in the portfolio of listed equity were applied to the selection of relevant infrastructure bonds. Of course, the equity of the corporate does not have to be listed. The issuers of bonds that were included in the bond portfolio are listed in Annex IV.

Calculation of spreads

1.90. Based on the time to maturity the daily spreads were calculated by using the interest rate term structure provided by the Deutsche Bundesbank. The Bundesbank term structure is based on German government bond yields.

1.91. In order to aggregate the spreads across different issues a simple average was calculated.

Analysis and results

1.92. For each rating class (AA, A and BBB), a portfolio was built based on the selected infrastructure companies. In each sub-portfolio, the bonds are of the same rating, but have different maturities. For each selected infrastructure company, more than one bond may be included in the portfolio. The portfolio constructed was compared with a non-infrastructure portfolio.

1.93. Since, as for equities, it was necessary to exclude companies which were not considered to be "real" infrastructure corporates, the number of companies available for each rating class is quite limited.

1.94. In order to allow for a comparison, portfolios of non-infrastructure corporates for the different rating classes were constructed. The behaviour of their spreads has not yet been separately analysed for financial corporates and non-financial corporates. A large part of the difference between the changes in spreads for the selected infrastructure bond portfolio and the corresponding non-infrastructure portfolio, especially during the financial crisis, may be due to the large proportion of financials.

1.95. The limited number of bonds in the infrastructure portfolio makes it difficult to analyse the spread behaviour for different maturity buckets. **Differences in the behaviour of average spreads over all maturities between infrastructure and non-infrastructure bonds may at least partially reflect simply differences in maturities, and not be due to differences in risk.** For AA and A the average maturity of infrastructure bonds is lower than for non-infrastructure bonds. The differences for BBB are rather small while the average time to maturity is lower than for AA and A.

1.96. In terms of the results, the empirical 99.5 % VaR for the infrastructure bond portfolio was roughly 50 % lower than for the non-infrastructure portfolio for all three rating classes considered.

1.97. Therefore, based on the analysis conducted so far, the spreads of the infrastructure corporate bonds were less volatile than for the non-infrastructure corporate bonds. As stated above, it should be underlined that the available number of issues and issuers is generally quite limited and there are especially few bonds with AA and BBB rating during the financial crisis. In addition, further analysis is necessary to understand the impact of different maturities and the composition of the non-infrastructure portfolio (in particular the proportion of financial and non-financial corporates).

7.3. Analysis of the iBoxx Utilities indices

1.98. Markit provides indices for bonds issued by utilities in EUR and GBP. Much of the information that the Markit indices provide is on an aggregated level. Therefore, the analysis can only be used as complementary evidence.

Spread behaviour

1.99. As a first step in the analysis the spread of the utilities indices was compared with the spreads for corporates in general as well as for financial and non-financial corporates in particular.

1.100. Markit does not provide sub-indices for different rating classes and sub-indices for maturity buckets are only available for bonds denominated in GBP. In addition, Markit weights the benchmark spreads of the individual bonds by the product of duration and market value in order to derive the index benchmark spread. It is therefore necessary to build a reference index for corporates that is comparable in terms of the weights for different rating classes and maturities.

1.101. The following graphs (figure 6 to figure 11) show the spreads for the utilities indices and the comparable corporate indices for both EUR and GBP[21]. It can be seen that the spreads for utilities and the comparable (non-financial) corporate indices behaved very similar before the global financial crisis. During the crisis the expansion in the spreads for utilities was markedly lower compared both with corporates as a whole, as well as with non-financial corporates. It is worth mentioning that the spread expansion for the EUR Utilities index in 2011 is comparable with the one observed during the global financial crisis.

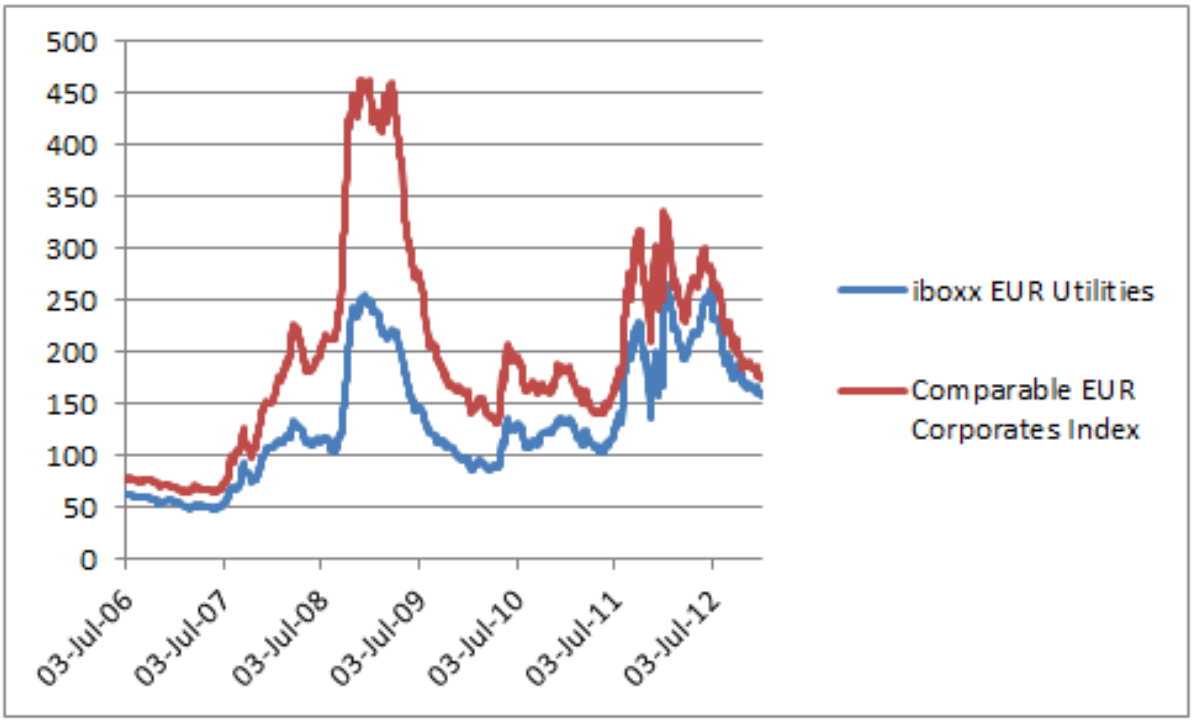

Figure 6: Spread behaviour for iBoxx EUR Utilities and comparable EUR corporate index

[21] The starting date for the period (July 2006 for the EUR indices and August 2006 for the UK indices) was chosen as granular index data for financials and non-financials was not available for earlier dates. The end of the period (December 2012) was chosen to cover the global financial crisis and the EURO crisis.

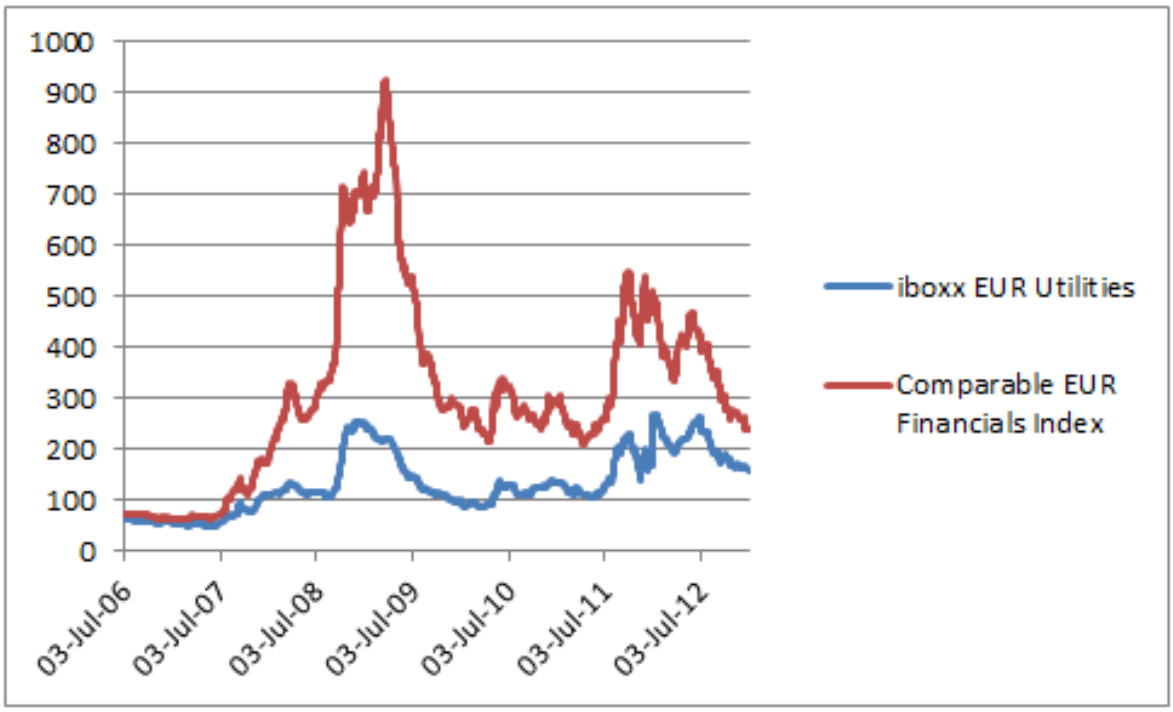

Figure 7: Spread behaviour for iBoxx EUR Utilities and comparable EUR financials index

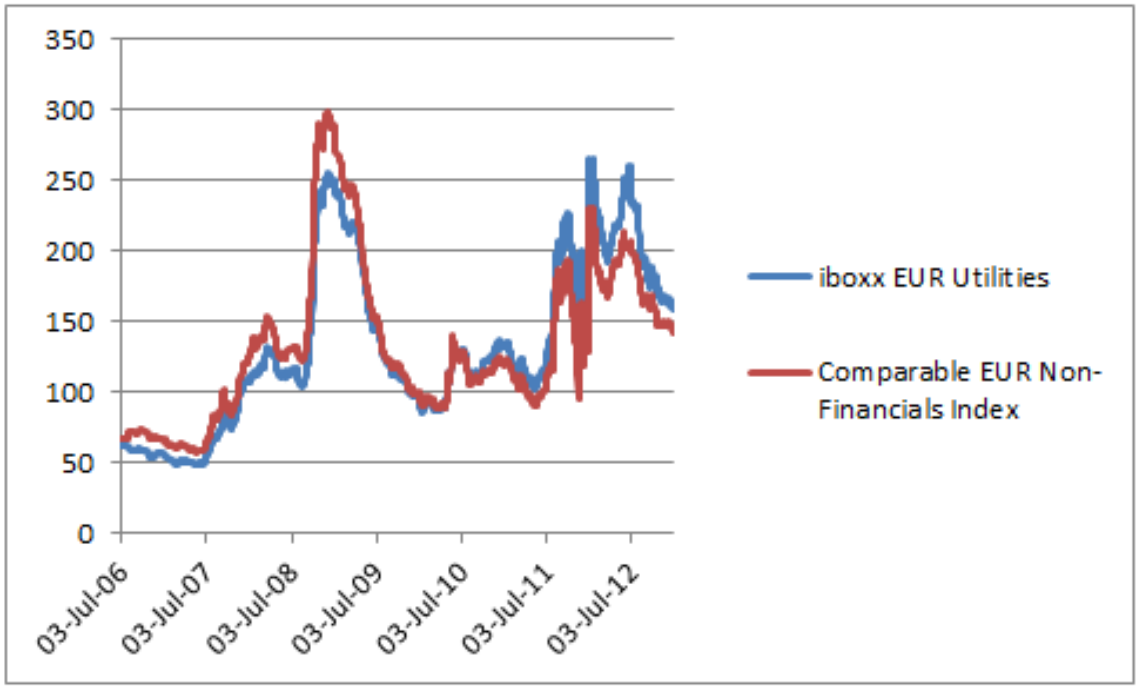

Figure 8: Spread behaviour for iBoxx EUR Utilities and comparable EUR non-financials index

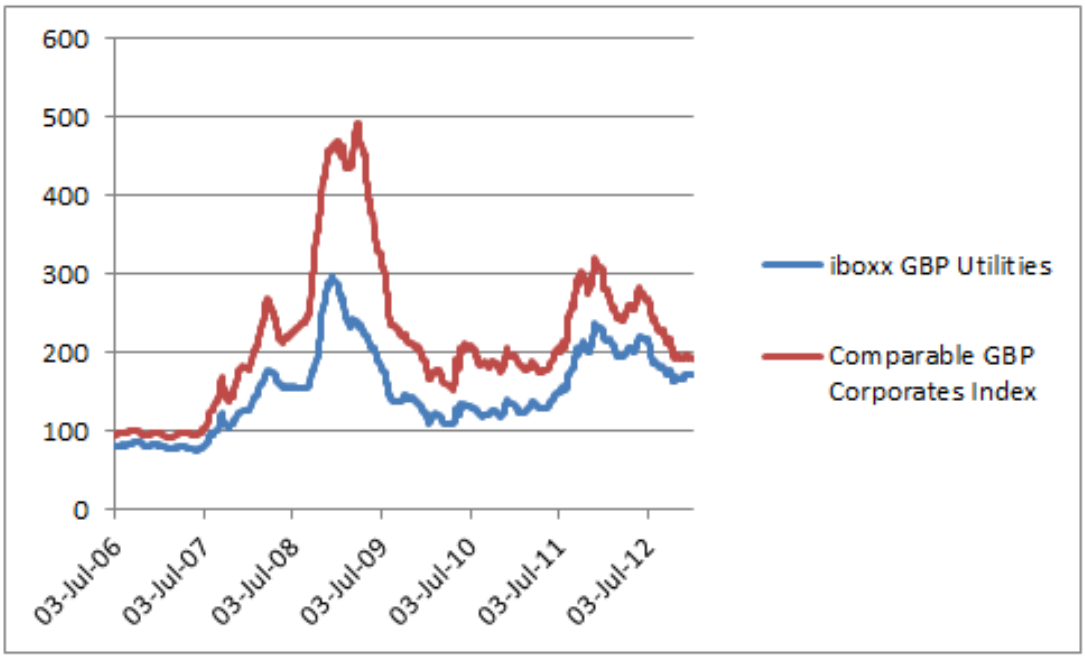

Figure 9: Spread behaviour for iBoxx GBP Utilities and comparable GBP corporates index

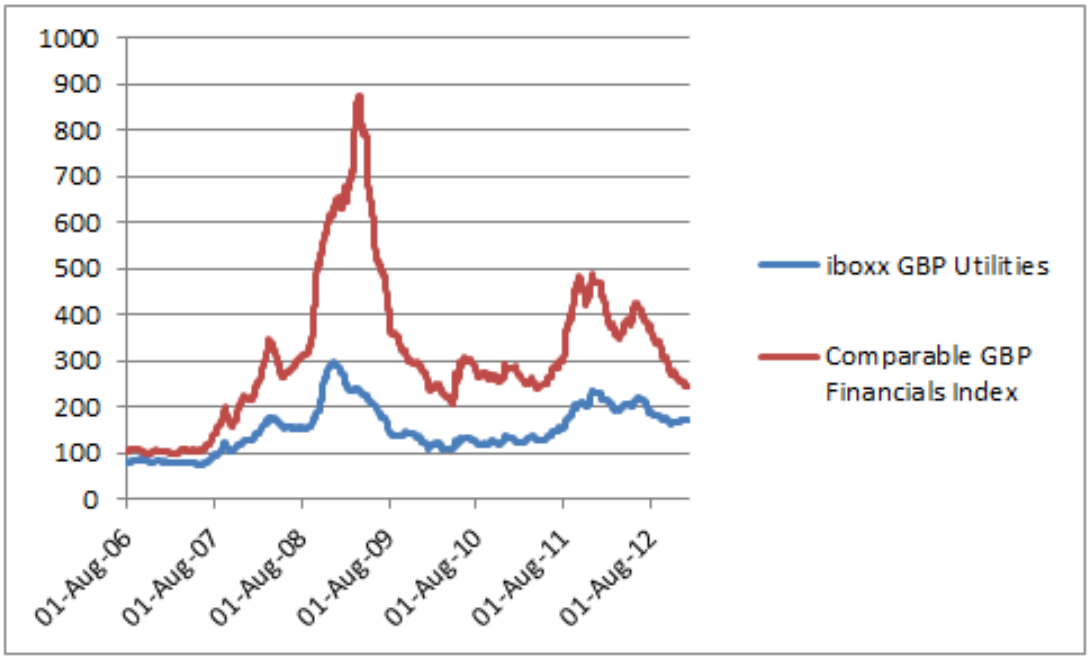

Figure 10: Spread behaviour for iBoxx GBP Utilities and comparable GBP financials Index

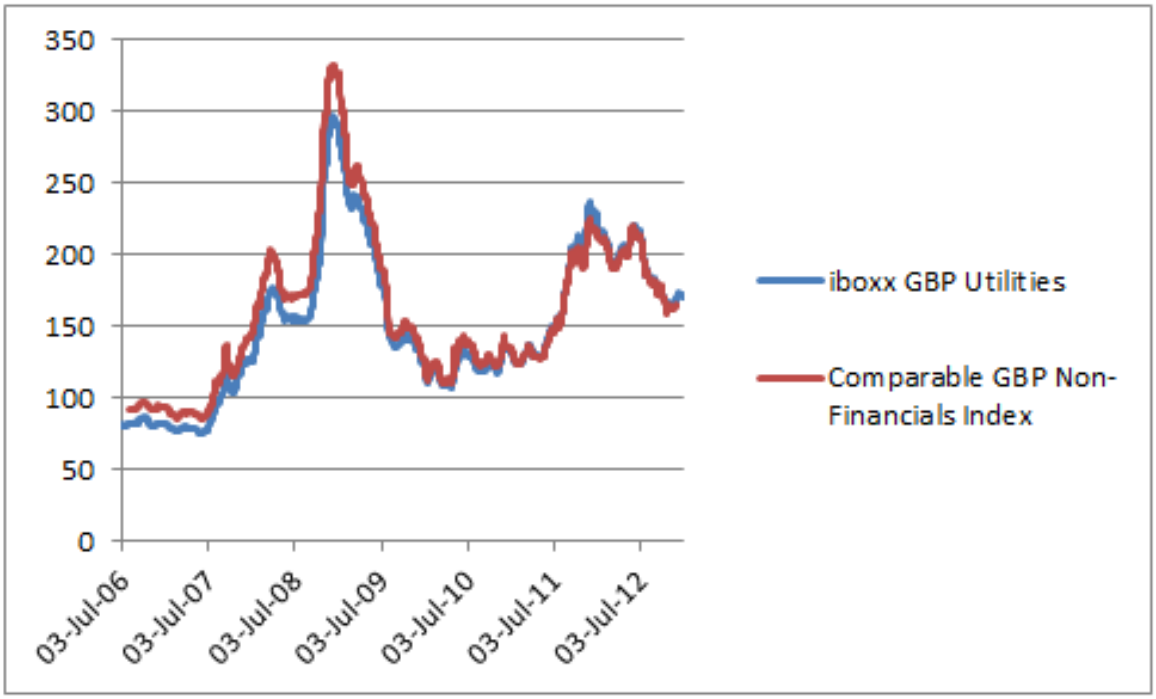

Figure 11: Spread behaviour of iBoxx GBP Utilities and comparable GBP non-financials index

Comparison between maximum expected and actual spread changes

1.102. As a second step it was checked whether the observed 12-month changes in the (annual index benchmark) spread of the utilities indices are in line with the maximum changes implied by the standard formula. The methodology is outlined in Annex IV. While the approach has a number of limitations (which are also described in the annex) it provides some complementary evidence.

Results

1.103. The graphs below (figure 12 and figure 13) compare the subsequent 12-month changes in the spreads of the iBoxx Utilities indices (in basis points) with the 99.5 % change implied by the standard formula for the period July 2007 to July 2008. The graphs show that the subsequent changes exceeded the 99.5 % changes implied by the standard formula between October and December 2007. When interpreting the results one has to be aware of the limitations that the approach has.

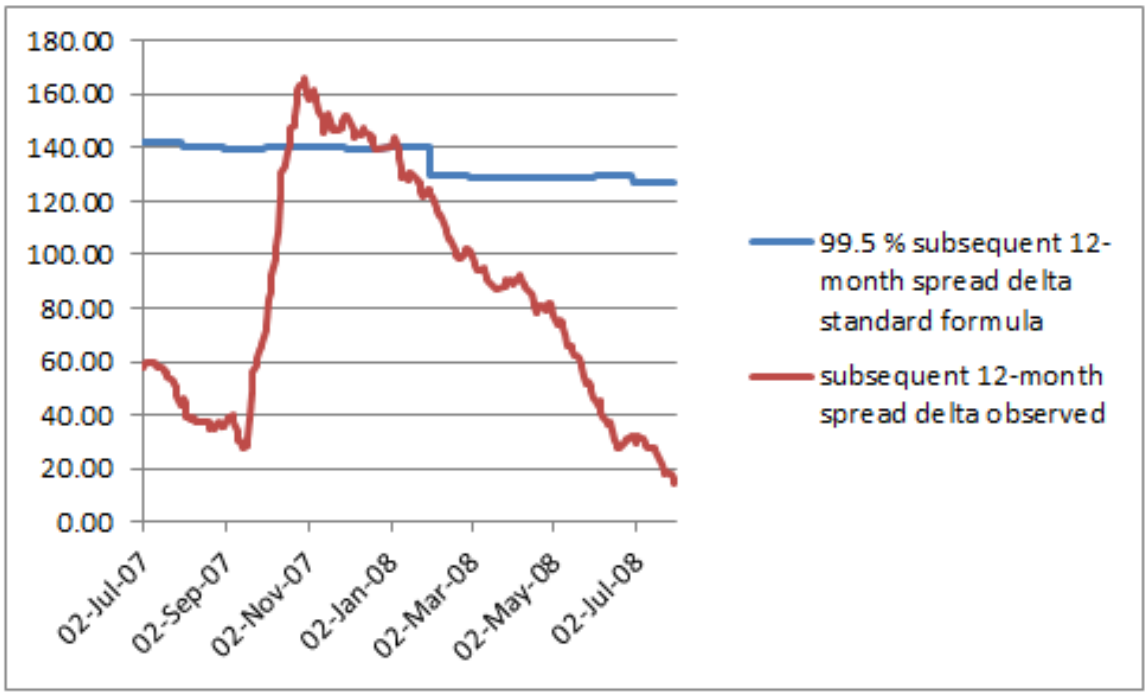

Figure 12: Actual vs. standard-formula implied 12-month spread changes for iBoxx EUR Utilities

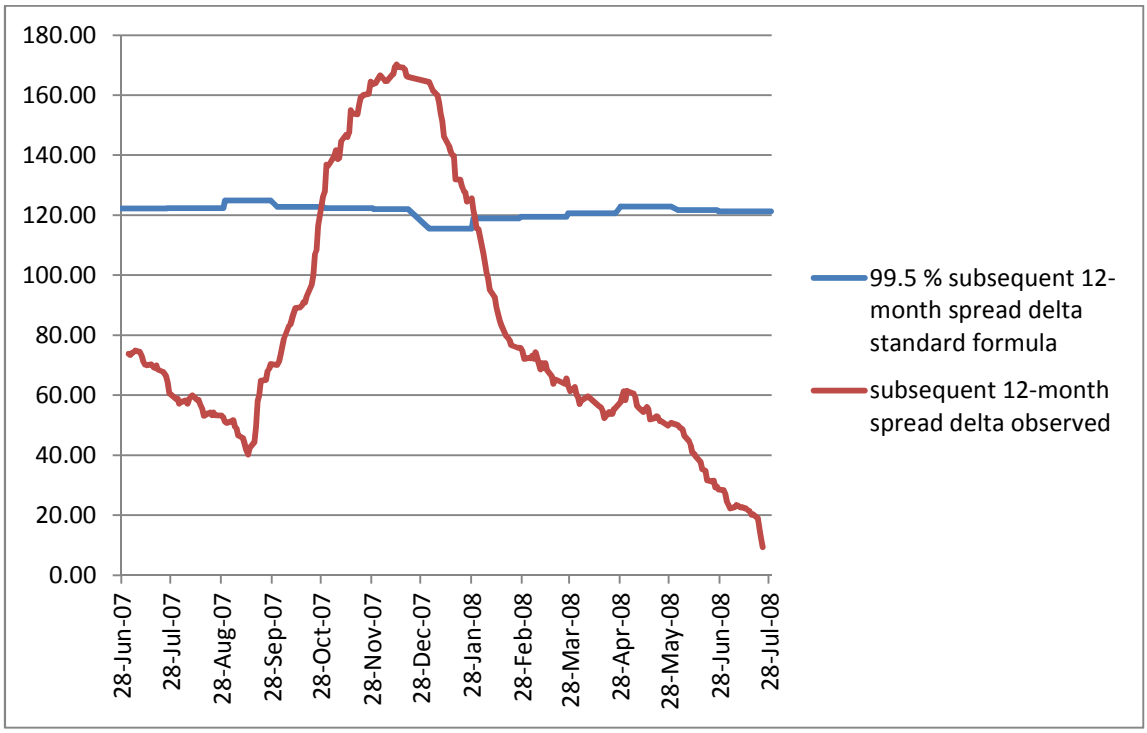

Figure 13: Actual vs. standard-formula implied 12-month spread changes for iBoxx GBP Utilities

1.104. In order to further illustrate the previous results the following graph (figure 14) compares for the same period the subsequent 12-month change in the value of a one million bond portfolio and the same composition as the iBoxx EUR Utilities Index resulting from changes in spreads and the 99.5% change implied by the standard formula.

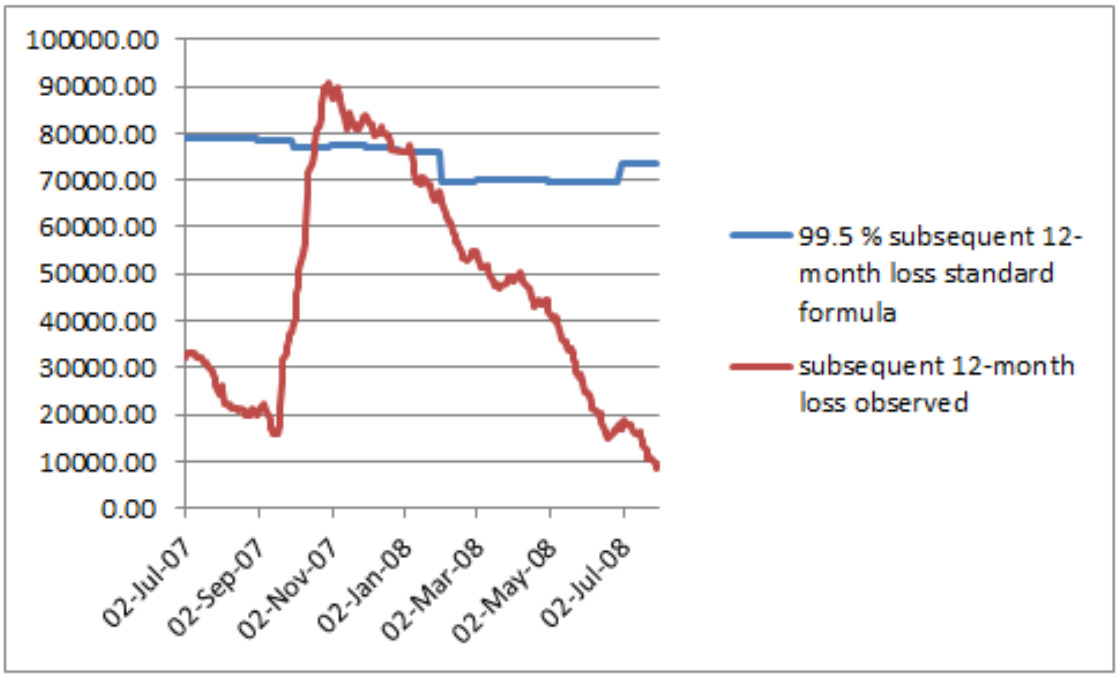

Figure 14: Actual vs. standard-formula implied 12-month changes in portfolio value

1.105. The results mirror those for the spreads.

1.106. In principle one could do the same calculations for longer periods. Given the unprecedented spread volatility during the financial crisis the observed spread changes for the other periods would probably be lower than the 99.5 % change implied by the standard formula. Moreover, the observations are not independent given the large overlap between the one-year periods.

1.107. Nevertheless, for a period of roughly three months the observed subsequent 12-month changes in spreads exceeded the 99.5 % change implied by the standard formula. On a stand-alone basis these results could be seen as evidence that the utility bonds represented in the iBoxx Utilities indices did not display a better risk profile than implied by their standard formula treatment. However, given the limitations of the approach, this result should only be used as complementary evidence.

7.4. Data on default and recovery rates for infrastructure corporate debt

1.108. Moody's study, referred to above, analyses the credit risk for infrastructure corporates and EIOPA recognised this work during the first call for advice. Following the latest call for advice, EIOPA has conducted more detailed analysis of the study and EIOPA is also grateful to Moody's for their support.

1.109. The Moody's study indicates that senior debt of infrastructure corporates has higher recovery values than senior debt of non-infrastructure corporates. In addition, infrastructure corporates display a higher rating stability than non-infrastructure corporates. Moreover, infrastructure corporate debt with a BBB rating displays a much lower cumulative default rate over 10 years.

1.110. It is worth emphasising that the recovery rates for senior **secured** infrastructure debt are meaningfully higher than for senior unsecured non-infrastructure corporate issues. The difference for senior unsecured infrastructure and non-infrastructure corporate issues is much lower. This shows the importance of a privileged access of the lender to the assets and cash flows of the infrastructure corporates in reducing the risk.

1.111. It seems plausible that this lower credit risk has an influence on the spread volatility of bonds issued by infrastructure corporates. For example, the lower risk of a downgrade in times of stress means a lower risk that the spread expands as the result of this downgrade.

1.112. At the end of 2014 utilities represented roughly two-thirds of the corporate infrastructure securities that Moody's rated. Consequently, the figures for credit risk are heavily influenced by them. If the fundamental credit risk has an impact on the spread volatility it should be observable for bonds issued by utilities (also as a meaningful overlap between the sample of infrastructure corporates rated by Moody's and the set of entities used by EIOPA to analyse the spread volatility can be expected).

1.113. Only if the fundamental credit risk for a set of infrastructure corporates was meaningfully better than for utilities might this be an indication for lower spread volatility than observed for utilities.

7.5. Conclusions debt calibration

1.114. For the iBoxx EUR and GBP Utilities indices the spreads were significantly less volatile than for indices of non-financial and financial corporates, which EIOPA constructed to be comparable in terms of duration and rating. The comparison of the spreads for a portfolio of infrastructure corporate bonds constructed by EIOPA and corresponding non-infrastructure bonds yielded similar results. However, in the latter case further analysis is necessary to understand the

impact of different maturities and the composition of the non-infrastructure index (in particular the proportion of financial and non-financial corporates).

1.115. EIOPA also devised an approach to compare the annual changes in the spreads of the iBoxx Utilities indices with the maximum changes implied by the standard formula. Although the methodology has a number of limitations, the results would appear to show that for each day between October 2007 and December 2007 the spread changes in the subsequent 12 months surpassed the maximum level implied by the standard formula. This might be an indication that the spread risk for utility bonds is not better than implied by the standard formula.

1.116. In summary, the analysis showed than the spreads of selected infrastructure corporate bonds were less volatile than those of non-infrastructure corporate bonds used for comparison. However, EIOPA would need to conduct further analysis prior to June before a sound judgment can be made on whether the spread risk of infrastructure corporate debt differs from the one implied by the standard formula.

1.117. Table 4 below provides a concise summary of the evidence that was collected and the (preliminary) conclusions drawn from it.

Source	Results	Limitations
iBoxx Utilities Indices	• spreads before the financial crisis similar to (non-financial) corporate bond indices • significantly lower spreads during the financial crisis • some evidence to indicate that risk profile is not better than implied by standard formula treatment	• predefined constituents • information only available on an aggregated level (no distinction between different rating classes, only limited information for different maturity buckets)
Moody`s default and recovery rates for infrastructure corporate debt	• senior debt of infrastructure corporates has higher recovery rates than non-infrastructure corporates • lower risk of downgrading for infrastructure corporates • result considered to be reflected in the spreads of infrastructure bonds	• differences for secured senior debt are meaningfully higher than for unsecured debt
Portfolio of selected infrastructure corporate bonds for rating classes AA, A and BBB	• significantly lower spreads of infrastructure corporate bonds than for (financial) non-infrastructure corporate bonds during the financial crisis 2008-2011 • overall high correlation between infrastructure and non-infrastructure indices • further analysis needed before a sound judgement can be made whether the spread risk differs from the one implied by the standard formula	• limited diversification (infrastructure mainly dominated by electric utilities); • limited number of observations for different maturity buckets • for AA and A very high percentage of financials in the portfolio of non-infrastructure bonds

Table 4: Summary of debt analysis

8. Scope and criteria for infrastructure corporates

8.1. General considerations

1.118. One important aspect of the decision on the scope and the criteria is the trade-off between the restrictiveness of the requirements and the level of the capital requirement. With a narrower scope resulting from more restrictive criteria a lower capital requirement may be justified. At the same time, the number of qualifying infrastructure investments decreases. Consequently, a scope which allows a significant proportion of the infrastructure corporate investment asset class to qualify seems preferable, instead of one which aims for a maximum reduction in the regulatory capital requirement.

1.119. For infrastructure projects EIOPA generally proposed a risk-based approach for the criteria[22], rather than one which described the precise features of qualifying entities. One reason for this approach was the proprietary nature of the Moody's database on project loans, which meant that EIOPA had limited information about the individual properties of the projects. The solution was to develop criteria that aimed to capture entities with a similar risk to those entities in the Moody's database. For this purpose, the Basel II "slotting approach"[23] and the criteria that rating agencies apply as part of their assessments were used. In contrast, there is a reasonably large amount of information available for infrastructure corporates that issue bonds or are listed on a stock exchange. EIOPA proposes to combine some precise features, with a limited number of risk-based requirements.

8.2. Determination of the scope

1.120. EIOPA analysed the responses to the call for evidence in order to understand what types of infrastructure corporates stakeholders deemed as relevant investments. As described in the Section 6.2 "Analysis of a portfolio of listed infrastructure corporate equity" some relatively simple criteria were used to identify a set of infrastructure corporates in order to analyse their risk profile. The purpose was to explore whether a different treatment for a broad set of entities could be recommended. EIOPA selected European companies with listed equities or traded bonds that derive the vast majority of their revenues from operating energy, transport and social infrastructure. Mere users of infrastructure were excluded. This means for example that an airport operator was included but not an airline. Another criterion was that the corporate does not derive a meaningful amount of revenues from activities outside the EEA or the OECD.

1.121. Based on some stakeholder comments EIOPA also looked at the risks of telecom carriers. However, based on an initial analysis, the results for equities

[22] For example, see the requirements on stress analysis, or for design and technology risk.
[23] For the slotting approach see Annex I of the EBA consultation on assigning risk weights to specialised lending exposures.

indicated that the risk for these entities is similar or even slightly higher than for corporates in general. Therefore, EIOPA decided not to look further into the risks of telecoms.

Question 2 - telecoms

(a) Do you agree with the assessment of the risks of telecom investments as evidenced by the historical price data?

(b) Are there any segments within the telecom industry that are safer than other segments, which deserve further granular analysis? If yes, please provide a comprehensive justification and supporting evidence including data, ISIN codes and examples.

Equities

1.122. For the proxies of listed equities (i.e. the portfolio of listed infrastructure corporate equity) an empirical 99.5 % VaR of the annual returns of 36 % was calculated. EIOPA considered also whether there is a subset of listed infrastructure corporates which display a meaningfully lower risk than the whole set. The equities of the companies in the energy transmission and distribution sectors, as well as the stocks of water utilities displayed on average lower volatility. This evidence could be used to support a differentiated treatment for entities with similar revenue mechanisms.

1.123. However, bearing in mind the cost and complexity associated with introducing a specific regulatory treatment, as well as the aim to have a meaningful impact, EIOPA considered these subsets to be too small. The calibration would also have to be based on a very small sample size, and in addition, stakeholders indicated that they are also interested in corporates which have a limited exposure to merchant risk.

1.124. Another consideration is that the observed 36 % is quite close to the 39 % risk charge for listed equities (type 1). There is also dispersion in risk between different sectors of listed equities (e.g. defensive and cyclical). At the same time, there is a meaningful difference between the risk observed for the listed proxies and the risk charge for unlisted equities of 49 % (type 2). In view of this, the costs and additional complexity associated with the introduction of a specific infrastructure corporate category are only considered to be justified if listed equities are judged to be an appropriate proxy for unlisted equity. This requires criteria to be developed to ensure that the risk profile of qualifying **unlisted** equity is similar to the one of the listed proxies.

1.125. The next Section 8.3 sets out proposed criteria based on the introduction of an equity risk charge of 36 % for infrastructure corporate equity investments that meet these criteria.

Debt

1.126. For debt the scope is dependent on the outcome of the analysis of the risk for the broad set of entities, which has not yet been concluded (See Chapter 7). Consequently, for bonds, EIOPA has not yet considered if it is possible to identify sufficiently large subsets with lower risk than the broad set of entities. Nevertheless, the criteria described in Section 8.3 could also be applied to debt investments if the same broad scope is decided upon.

Unrated debt

1.127. Should infrastructure corporate debt with an ECAI rating display a meaningfully lower risk than implied by the standard formula the question arises whether qualifying criteria for debt without an ECAI rating should be developed. Despite a number of disadvantages of doing, EIOPA followed this approach for infrastructure project debt on the basis that there is normally no external rating and that the costs for obtaining such a rating can be prohibitive for projects. These arguments are considered to be less relevant for corporates, which would normally be larger and are often rated. In case the analysis should justify a different treatment of infrastructure corporate bonds with an ECAI rating, EIOPA will consider the desirability and feasibility of developing criteria that would allow infrastructure corporate debt without an ECAI rating to qualify.

Question 3 – debt without an ECAI rating

(a) What is the volume of infrastructure corporates without an ECAI rating?

(b) What is the typical amount of a corporate debt issuance? How does this relate to the cost of obtaining an ECAI rating?

(c) What criteria could be used to identify suitable debt without an ECAI rating and to eliminate unsuitable investments? Please provide specific proposals.

8.3. Development of criteria

1.128. The criteria should ensure that the risk of the qualifying infrastructure investments is comparable to the entities which were used for the calibration. Ideally, the criteria would be derived from easily observable characteristics of the entities in the sample that determine their risk. However, there are some drawbacks of too simplistic an approach that focuses only on easily observable properties:

- The absence of entities performing certain activities from the portfolio of listed infrastructure corporates does not necessarily mean that the risks arising from such activities are higher. There are, for example, operators of tunnels with listed equities that are therefore included in the portfolio, while no listed bridge operator could be identified. However, there is no reason to believe that a bridge is per se of higher risk than a tunnel.

EIOPA was also not able to identify any social infrastructure corporate with listed equities. However, EIOPA is aware from its previous analysis of infrastructure projects that certain types of social infrastructure corporates can have relatively low risk.

- Some easily observable properties (e.g. the type of activities) may not be sufficient to separate lower and higher risk investments. For example, the risk of a corporate that generates power will depend largely on the mechanisms (contracts, markets, regulations) that determine prices and volumes, rather than the fact that is generates power.

1.129. Thus, EIOPA considers that the lower risk for qualifying infrastructure equity investments does not result primarily from the particular characteristic of the assets themselves, but from the low demand risk due to the contractual arrangements, relevant regulations or the fact that essential services are provided with barriers to entry, plus the existence of a reasonable financing structure. Thus, EIOPA aimed to strike a balance between risk-sensitivity and undue complexity and decided to focus on two main drivers of risks:

- There should be certain types of revenue mechanisms.
- The corporate should not be overleveraged.

1.130. Given the limited number of criteria which make some judgement necessary the proposed capital charge can only be applicable for a **diversified** portfolio of equity (and potentially debt subject to the further work to be done) investments.

1.131. One might argue that the risk of the qualifying corporates would actually be lower than implied by the equity proxies (in the portfolio of infrastructure corporates), as not all of them would meet the criteria. However, whether individual companies comply with the requirements is not easy to decide where no external rating is available or they are subject to merchant risk. Most of the entities in the portfolio benefit at least from some barriers to entry. In addition, the analysis of the risk for the individual stocks suggests that the exclusion of those corporates in the portfolio which could only comply with the predictability criterion by demonstrating that they are subject to the low demand risk, would not have a meaningful impact on the results for the infrastructure equity analysed (i.e. the equity proxy portfolio).

8.4. Qualifying criteria

1.132. This section presents draft criteria, together with EIOPA's rationale and some supporting evidence.

Definition

'Infrastructure corporate' means an entity or group which derives the vast majority of its revenues from owning, financing, developing, or operating infrastructure assets in the EEA in the following lines of business:

- generation, transmission or distribution of electrical energy;
- distribution or transmission of natural or petroleum gas;
- provision of water, wastewater or recycling services;
- transport networks or the operation of transport assets;
- social infrastructure.

The assessment whether the conditions above are met should be based on the last reporting period for which figures are available or a financing proposal.

In case a general credit assessment or an assessment for senior unsecured exposures issued by an ECAI for the infrastructure corporate exists it shall be assigned to a credit quality step of at least 3. Otherwise, the infrastructure corporate has been active in these lines of business for at least five years.

Rationale

1.133. The closed list of activities in the definition serves as a "filter" to ensure a certain similarity between qualifying infrastructure corporates and the entities in the calibration sample (i.e. the portfolios of infrastructure corporate equity). The list should capture the vast majority of relevant activities. At the same time, it excludes "exotic" activities.

1.134. Based on the claim by stakeholders that they are interested in investing in infrastructure in Europe and the policy objectives of the CMU action plan it is proposed that the vast majority of revenues are from the EEA.

1.135. The requirement for a sufficiently long history of operations is intended to ensure that the corporate has a certain maturity and excludes new companies. This may seem problematic with respect to the objective of the Commission's CMU to incentivise investments. However, corporates are less likely to be completely new enterprises compared to projects.[24] Moreover, the entities that were used for the calibration are established or mature companies. It also provides an offset for the lack of requirements to limit construction risk, as well as reduces the risk that there are not sufficient operational capabilities. Finally, a history of operations makes it easier to decide whether revenues from an infrastructure corporate are sufficiently predictable as a result of low demand risk (see revenue predictability criterion below).

1.136. The specification of the period on which the assessment of compliance should be based makes the decision easier.

Question 4 – definition of infrastructure corporate

(a) Do you have specific examples of infrastructure sectors and corporate structures that would inadvertently fall outside this definition?

[24] During the call for evidence, it was stated that corporates can often be former projects which once they are more established or mature took on a corporate structure.

(b) What volumes would such examples represent?

(c) Regarding the requirement for a minimum number of years of operation or for an external credit assessment specifically, are there cases where would this lead to the exclusion of safer infrastructure corporates? If so, how would you propose to appropriately limit the construction or operating risks; would the requirements for infrastructure projects be appropriate for example?

Evidence

1.137. The sectors are derived from the activities of the entities that have been used for the calibration analysis. There is no social infrastructure corporate in the equity sample and only a few in the debt sample. The addition of this sector was based on the evidence on social infrastructure gathered during the work on infrastructure projects and the declared interest of insurers in this sector.

1.138. Given that the vast majority of companies have European origins, they earn a large part of their revenues in Europe (even though some may have a meaningful share in other OECD countries). The requirement that the vast majority of revenues comes from EEA countries reduces the degree of geographical diversification. At the same time, it can be seen to reduce political risk.

1.139. The entities that were used for the calibration are mature companies.

Revenue predictability

The revenues generated by the infrastructure assets shall meet the following conditions:

1. One of the following criteria is met:
   - (i) The revenues are availability-based;
   - (ii) The revenues are subject to a rate-of-return regulation;
   - (iii) The revenues are subject to a take-or-pay contract;
   - (iv) The level of output or the usage and the price shall independently meet one of the following criteria:
     - a. it is regulated;
     - b. it is contractually fixed;
     - c. it is sufficiently predictable as a result of low demand risk;
2. Where the revenues are not funded by payments from a large number of users of the service, the party which agrees to purchase the goods or services provided by the infrastructure corporate shall be at least one of the following:
   - (i) an entity listed in Article 180(2) of this Regulation;

(ii) a regional government or local authority listed in the Regulation adopted pursuant to Article 109a(2)(a) of Directive 2014/51/EU;

(iii) an entity with an ECAI rating with a credit quality step of at least 3;

(iv) an entity that is replaceable without a significant change in the level and timing of revenues.

3. The revenues shall be diversified in terms of activities, geographical location, or payers, unless the revenues are subject to a rate-of-return regulation.

Rationale

1.140. The criterion selects those corporates with a higher stability of revenues. This stability can come from a contract with a creditworthy off-taker, a regulation or the provision of an essential service with barriers to entry which results in low demand risk.

1.141. The exclusion of corporates where the revenues are "sufficiently predictable as a result of low demand risk" would reduce the subjectivity of the criterion but the remaining scope would probably no longer justify a different regulatory treatment.

1.142. Compared with projects, investors in infrastructure corporates often have less control over assets and cash flows. Diversified revenues offer at least a partial offset.

1.143. Due to their revenue predictability, it is not necessary to apply the requirement for diversified revenues to corporates subject to a rate-of-return regulation.[25]

Evidence

1.144. The importance of the revenue mechanism is obvious from basic economic reasoning.

1.145. The share prices of corporates with a rate-of-return regulation (e.g. energy transmission and distribution, and UK water utilities) displayed lower volatility.

1.146. In the first call for advice, EIOPA also collected evidence for a lower risk of projects with contracted revenues like Public Private Partnerships and Public Finance Initiatives (PPP/PFI).

1.147. The entities in the calibration samples that are exposed to market risk (e.g. integrated electrical utilities, airports, road operators) are to a certain extent protected from competition by barriers to entry.

[25] Rate-of-return regulation should be understood as including other economic regulations involving price caps or revenue caps with similar economic effects.

1.148. The entities in calibration samples have mostly diversified revenues. This is not necessarily the case for entities which are active in energy distribution or transmission, but these corporates displayed comparatively low risk.

Financial structure

In case a general credit assessment or an assessment for senior unsecured exposures issued by an ECAI for the infrastructure corporate exists it shall be assigned to a credit quality step of at least 3. Otherwise the capital structure of the infrastructure corporate shall allow it to service all its debt under very robust assumptions based on an analysis of the relevant financial ratios.

Rationale

1.149. This criterion aims to ensure that the benefits of relatively safe revenues are not voided by high financial risk. Even when the operational risk is low (e.g. due to contracted revenues) high financial risk may translate into high overall risk.

1.150. The requirement does not make an external rating mandatory. However, it disqualifies infrastructure corporates below a certain rating, since a rating below credit quality step 3 provides a strong indication of higher risk. It is also worth mentioning that according to one response to the call for evidence, the majority of infrastructure corporate debt is externally rated.

1.151. An external rating reflects many risk factors that are also relevant for the equity investors which have a subordinated claim. Moreover, an investment grade rating, or at least a reasonable degree of leverage, facilitates access to debt markets in a situation of financial stress.

Evidence

1.152. Most of the larger infrastructure corporates in terms of market capitalisation that have been used for the calibration analysis have a rating of at least BBB. The corporates which were used to derive the type 1 equity calibration were predominantly "blue chips" with investment grade ratings. Equity investors are subordinated to lenders. It may therefore be difficult to justify a lower capital requirement for qualifying equities where the credit risk of debt issued by the infrastructure corporate is higher than for the debt of corporates which were used for the equity risk charge calibration.

Potential requirement regarding a listing and minimum size

1.153. All the entities that have been used for the equity calibration analysis are obviously listed. This raises the question whether the results can also be applied to unlisted entities. It can also be noted that in its 2010 advice for the Level 2 Implementing Measures CEIOPS advised for a different treatment of unlisted and listed equities based on the results for a listed proxy for private equity

investments. Therefore, as a general starting point, the current standard formula approach is to consider unlisted entities as of higher risk than listed entities.

1.154. However, in principle the (short-term) risk of an entity should not depend on whether it is listed or not. There may be systematic differences between listed and unlisted entities. The listed entities that EIOPA has analysed are generally large, mature companies with diversified revenue bases. Based on discussions with insurers, it seems this may not be the case for some of the infrastructure corporates they are interested in investing in. However, it should be possible to develop criteria to capture the characteristics of the listed proxies that contribute to their risk, by requiring diversified revenues, a minimum number of years of operation and a reasonable degree of leverage. There is of course no possibility to check the effectiveness of these criteria based on market prices. However, they are based on fundamental economic reasoning which would ideally be supplemented by a comparison of quantities like cash flows, revenues and profits for listed and unlisted entities that indicated a similar level of risk for both categories (see Section 6.4 "Evidence in terms of cash flows and revenues"). It can also be mentioned that investors in private transactions may have greater control over the infrastructure corporates compared to general shareholders of a listed company, and ideally a better understanding of the transaction.

1.155. Therefore, the proposed criteria do not require that the equity of the infrastructure corporate is listed.

1.156. The selected listed entities in the portfolio of infrastructure corporate equity had in 2014 a minimum market cap of 500 million USD. As with the issue of listed compared to unlisted equities, the diversified revenue basis and the maturity that is normally associated with a certain market value of equity or debt can be seen as risk relevant. However, it is not necessary to introduce an explicit requirement regarding entity size, if the criteria set out in this section are effective in addressing the relevant risk properties.

Question 5 – Other criteria for infrastructure corporates

Are there other criteria not covered by this section (Section 8.4) that are used by investors to identify safer infrastructure corporates?

9. Scope and criteria for EIOPA's advice on infrastructure projects

9.1. Introduction

1.157. The recommendations during the first call for advice were based on evidence for infrastructure projects financed by SPVs[26]. Based on these recommendations, the amendment to the Delegated Regulation includes amendments to Article 1 and a new Article 164a. During the first call for advice, EIOPA judged that there was not a clear rationale to justify a widening of the scope, which would thereby entail some "extrapolation" from the evidence base. As referred to above, EIOPA also felt that there were some delineation issues to be overcome in order to distinguish between different types of corporates.

1.158. Since October 2015, EIOPA has discussed the issue further with stakeholders. It has been argued that infrastructure corporates can exhibit a similar profile, with some of the following points being made:

- The underlying assets and thus revenue predictability can be the same.
- Similar protections for investors can be in place, including restrictions on indebtedness and on the types of permitted activities.
- In sum, a "substance over form" approach should be taken which does not incentivise one structure over another.

1.159. Bearing in mind these views, EIOPA has conducted further analysis of the issue and reviewed the scope and criteria included in the first call for advice. This has entailed the following principal aspects:

- To further understand the different types of financing structures.
- To consider whether changes to the scope and criteria could be made whilst maintaining an equivalent level of risk and thus allowing for the same calibration to be used.
- To consider if changes to the scope and criteria would have a meaningful impact in terms of additional high quality investments being able to qualify.

1.160. During the call for evidence, EIOPA asked stakeholders how the qualifying criteria could be modified to allow suitable infrastructure corporates to qualify, whilst providing for a similar outcome in terms of risk. Some of the comments are reflected in the proposals made in this section; in other cases EIOPA was not convinced that an equivalent level of risk could be achieved. It can also be noted that not all of the comments received were, strictly speaking, only relevant to the distinction between infrastructure projects and infrastructure corporates, but rather concerned the suitability or practicality of the criteria in general. EIOPA considered all of the comments made, but has not proposed a change to the position presented in its first call for advice in September 2015,

[26] Moody's Investors Service, *Default and Recovery Rates for Project Finance Bank Loans, 1983-2013* (March 2015), 7-8.

unless it was considered appropriate to clarify EIOPA's intention or some additional evidence or argument was provided.

9.2. Proposed revisions to the qualifying criteria

SPV financing restriction – definition of infrastructure project entity

1.161. Having conducted some further analysis, EIOPA would accept that some flexibility regarding the legal or financing form can be allowed for provided the key risk characteristics are met. The main features of the higher quality infrastructure investments that EIOPA identified during the first call for advice were, amongst other things, the higher predictability of revenues and the protection mechanisms for investors which lead to higher recovery rates. EIOPA recognises the stakeholder views that these features are not in theory limited to project financing, and thus considers that it is possible to remove the restriction to SPV financing.

1.162. However, it is important to note that such a change is not intended to capture all types of "corporates". The relatively large, diversified corporates that EIOPA has analysed in Chapters 5-8 above have some different risk properties and therefore warrant a different treatment in the standard formula. The intention is to capture corporates which are similar to projects; examples of this would be where more than one project is combined into one entity or holding company, or where there is a single project but the financing structure means that there is not a single infrastructure project entity. Consequently, the term "is not permitted to perform any function than", which was intended to limit qualifying investments to SPVs, has been removed from the definition.

1.163. EIOPA considers that the most appropriate way to capture the relevant types of entities and to eliminate unsuitable investments is not to prescribe a certain structure or type of entity in the definition, but rather to rely on the existing detailed qualifying criteria. As a result, the definition now refers to the "infrastructure project" rather than "infrastructure project entity" and the definition allows for the project to be in the form of a single entity or a group. The term *project* has been kept in order to distinguish between this asset class, which is based on the evidence for infrastructure projects, and any potential new asset class for infrastructure corporates in general.

1.164. Since the existing qualifying criteria had been drafted based on the term "infrastructure project entity" some drafting changes are necessary to most of the criteria to accommodate this change. In some cases, where the requirement applies in relation to the investment as a whole, irrespective of the structure, it was no longer considered necessary to specify the addressee of the requirement (i.e. previously it was specified that the requirement should be met by the "infrastructure project entity").

1.165. The removal of the restriction to SPV financing raises the question of the extent to which entities will be able to qualify which conduct other types of business activities (whether or not they are related to infrastructure). The current definition of "infrastructure project entity" includes terminology from Article 147(8) of Regulation (EU) No. 575/2013 (CRR) regarding the "primary source of payments…is the income generated by the assets being financed". EIOPA considers that in theory this allows the infrastructure SPV to conduct some "non-core" infrastructure or ancillary activities. Within an SPV financing model, EIOPA did not consider the risk to be significant that a project would engage in material amounts of non-infrastructure activities, which could thereby result in significant additional risks. However, the removal of the restriction to SPV finance would increase this risk.

1.166. EIOPA does not consider it to be sufficient that infrastructure is the primary or predominant activity of the entity or group since this would in theory allow investments to qualify that only conducted just over 50 % infrastructure. EIOPA is also reluctant to recommend a specify threshold, since this would be somewhat arbitrary and the nature of activities can vary considerably between different sectors. EIOPA therefore proposes to use the term "vast majority". This indicates that the proportion of infrastructure activities needs to be well above 50 %, but some judgement can be used to reflect for example, the established practice within a particular sector. A similar approach is proposed for the criteria for infrastructure corporates (see Section 8.4 "Qualifying Criteria").

1.167. Furthermore, the removal of the restriction to SPV financing should not result in an increased the level of risk because the requirements regarding stress testing and predictability of cash flows will still need to be met.

Definition of infrastructure assets

1.168. One respondent to the call for evidence proposed to include the term "assets" within the definition of "infrastructure assets" on the basis that some types of infrastructure, for example rolling stock companies, may not be covered by the terms "physical structure" or "facilities" in the existing definition. EIOPA considers this to be a reasonable clarification.

Stress testing

1.169. As EIOPA explained during the first call for advice, the stress testing requirement is a crucial element of the criteria, as well as one which allows for the assessment to be tailored to the risks of the particular project. EIOPA considers that this requirement should remain fundamentally the same in order to ensure that only suitable investments qualify. At the same, the current requirement was drafted from the perspective of a single infrastructure project entity structure and therefore it is necessary to review the approach.

1.170. Bearing in mind that the definition has been amended to allow for non-SPV structures that may conduct a proportion of non-infrastructure activities, in order to ensure that an equivalent level of risk is achieved, EIOPA believes that the requirement should be met in relation to the infrastructure activities.

1.171. As a result, the proposal is that only revenues from "pure" infrastructure, which satisfy the definition of "infrastructure assets", should be taken into account when assessing whether financial obligations can be met under sustained stresses. Thus, where there are revenues from other non-infrastructure activities, it would not be possible to take these into account as part of the stress testing requirement. It would, however, be necessary to consider all of the risks associated with the investment, including those stemming from the other activities.

Question 6 – identifying different revenue streams

Do you envisage any difficulties to distinguish between revenues stemming from infrastructure compared to non-infrastructure activities? Please justify your response.

Predictability of cash flows

1.172. EIOPA considers that the requirement regarding the predictability of cash flows is appropriate and necessary to ensure that only high quality projects can qualify. As EIOPA stated in Final Report to CP 15/004 it should be possible for a part of the revenues to not meet the requirements specified and overall the cash flows still be predictable. However, this should not be more than an immaterial part. Furthermore, the existing test within the requirement allows for the undertaking to demonstrate the revenues are sufficiently predictable where there is low demand risk. Consequently, qualifying investments are not restricted to those with contractually fixed or regulated revenues, even though these provide the highest degree of predictability.

Contractual framework

1.173. One of the main considerations regarding the contractual framework is the requirement for asset security. EIOPA received representation during the first call for advice that the requirements were too restrictive and some changes were made, including acknowledging that there may be legal restrictions on the ability for a project to pledge certain assets. Nevertheless, stakeholders have continued to express concerns regarding the practicability of the requirement and the need to have some flexibility in relation to the type of security obtained depending on the nature of the investment.

1.174. The issues raised highlight the challenge of developing legislative criteria that need to be met in all circumstances, as opposed to an approval or assessment process whereby indicators are used to create an overall score, such as in the Basel II "slotting approach" or rating agency methodologies.[27] When legislative criteria are used, in order to ensure that all unsuitable projects are eliminated, this may also result in the elimination of some suitable investments. Such investments may fail to meet one particular feature in the legislative criteria, however, still score highly in an overall assessment process because the weakness in the one aspect is compensated by other positive features.

1.175. To start with, it is worth reiterating EIOPA considerations regarding this requirement. First, as EIOPA has explained, the evidence for a lower calibration for project investments is based on analysis by Moody's that such investments have higher recovery rates. In their study Moody's explain the characteristics that had typically mitigated the loss given default including first ranking security interests over all material assets.[28] In addition, similar to many of the qualifying criteria, EIOPA took as a starting point the Basel II "slotting approach" in which at least "security interests in all project assets, contracts, permits and accounts necessary to run the project" is considered necessary to achieve a category three (out of four) score for this criterion (i.e. the third highest quality). The importance of security interests are also highlighted in rating agency methodologies, as well as academic studies on project finance.[29]

1.176. Having discussed the issues further with stakeholders and conducted further analysis, EIOPA considers the following points to be relevant:

- Although a negative pledge can provide a reasonable level of assurance regarding the recovery rate when combined with the other controls such as restrictions on indebtedness and debt seniority, it is not considered to provide a sufficient level of protection. This is because it would result in the need to rely on some type of insolvency proceedings, as well as the potential for unforeseen or unknown claims to arise on the assets which could then be senior to an unsecured senior debt claim. This could include for example claims for damages or compensation (e.g. due to environmental breaches or injuries).
- Although a pledge of shares should normally be a sufficient security mechanism because it allows the investors to take over the project, EIOPA understands that there are cases where investors cannot or would not want to enforce share security. One case could be if the project company goes bankrupt and its shares become worthless. In these cases, security in the underlying assets, contracts, cash flows may then be relevant.
- EIOPA would recognise that there are cases where it may be legally possible for asset security to be given to the investor, but it would not be

[27] See Chapter 3 of EIOPA CP 15/004
[28] Moody's, Project Finance Bank Loans, 49.
[29] Stefano Gatti, *Project Finance in Theory and Practice. Designing, Structuring and Financing Private and Public Projects* (San Diego, Elsevier, 2008), 265-274; Fitch Ratings, *Rating Criteria for Infrastructure Project Finance: Master Criteria*, (July 2010), 25.

considered critical to the creditor's interests to be given full asset security.

- The financial structure may prevent the investor taking direct asset security, for example where there are separate financing vehicle. In these cases, there can still be other controls, but these may be contractual rights rather than the legal rights provided by a direct asset pledge.
- The criterion that EIOPA proposed in its previous advice could be interpreted more strictly than EIOPA intended. The term "security in all assets and contracts necessary to operate the project", is intended to capture the assets and contracts that are more material to investors to protect their interests. Such an interpretation could be expressed by focusing on the critical assets and contracts.

1.177. In view of these considerations EIOPA proposes to (option 1 - see Section 9.3):

- Replace the term 'necessary' with 'critical' to indicate that security does not need to be taken over each and every asset and contract, but some discretion can be used to identify the most relevant security interests
- Allow for other structures to a single SPV financing model, by using the term the 'benefit of security', in terms of asset security, and 'other equivalent controls' in terms of the equity pledge requirement.

1.178. At the same time, EIOPA also considered a more substantive change to the requirement to introduce a principles based drafting approach (option 2 – see Section 9.3). In this case, the requirement for asset security would be a "benchmark" rather than an absolute" requirement. This would allow for the undertaking to demonstrate to the supervisor that alternative security arrangements are adequate.

1.179. Overall, EIOPA prefers option 1, since asset security is considered to be a necessary element to limit the scope to safer investments, and EIOPA is not convinced that an equivalent level of risk can be achieved without it. EIOPA has included both options within the consultation paper to allow stakeholders to provide feedback on the two approaches. However, since Option 2 is likely to increase the risk of different interpretations by different member state supervisory authorities, should this approach ultimately be the preferred approach, EIOPA believes that it would be necessary to issue Guidelines to support a consistent application of this requirement.

Question 7 – security and negative pledge

(a) Would option 1 (compared to option 2) lead to the exclusion of arrangements which provide an equivalent level of protection to asset security and an equity pledge? Please provide specific reasons and examples.

(b) Do you consider that a "negative pledge" clause can provides equivalent protection to the security arrangements required by the proposals in Section 9.3?

(c) If yes, please provide specific reasons and examples of infrastructure sectors and countries where a "negative pledge" should be allowed without compromising the safety and recovery of your investment.

1.180. EIOPA would also use the opportunity to propose a number of clarifications to the previous advice regarding the contractual framework.

1.181. Concerning the requirement for investors to be protected against the termination of the project, EIOPA would agree with a comment made during the call for evidence that this provision would not be necessary in the case of regulated infrastructure, where the revenues are governed by a regulatory framework.

1.182. Regarding the restrictions on the issuance of new debt, a number of respondents questioned whether the requirement would allow for contractual or covenanted limits to be placed on the incurrence of new debt rather than it being necessary for investors to give consent at the relevant time. As EIOPA's stated in the Final Report CP 15/004 the requirement is considered to "allow for it to be specified in the contractual arrangements that the issuance of new debt is permitted where a certain threshold or cap is exceeded". Nevertheless, EIOPA has made a proposal to clarify this more explicitly in the requirement.

1.183. It was also noted by stakeholders that some of the protections to investors are not only part of the contractual framework, but can also stem from the underlying regulatory framework. EIOPA proposes to recognise this in the drafting of the criteria.

Financial risk – requirement for unrated debt to be senior

1.184. In the first call for advice, EIOPA amended its advice following the public consultation to take account of a stakeholder comment on the importance of allowing there to be a "super-senior class of debt". The revised requirement stated that the debt instrument should be senior to all other claims except statutory claims and those from derivative counterparties.

1.185. Following further comments from stakeholders during the call for evidence, it is proposed to clarify that such "super-senior" claimants can also include claims from liquidity facility providers, and trustees. EIOPA believes that the latter may already be considered a statutory claim in some jurisdictions. In theory, this change could increase the risk since debt providers will be slightly more subordinated. However, EIOPA considers this to be a reasonable and non-material change since such claimants are not expected to be significant in terms of their number or amount, and thus that it reflects a reasonable market practice.

9.3. Draft advice

1.186. The draft advice below is based on points 55a and 55b of Article 1 and Article 164a of the Delegated Regulation.

Definitions

'Infrastructure assets' means physical assets, structures or facilities, systems and networks that provide or support essential public services.

'Infrastructure project' means an entity or group which derives the vast majority of its revenues from owning, financing, developing or operating infrastructure assets.

Stress testing

The cash flows generated by the infrastructure assets allow for all financial obligations to be met under sustained stresses that are relevant for the risks of the project;

The stress testing shall consider risks arising from non-infrastructure activities, but the revenues generated by such activities shall not be taken into account when determining whether the financial obligations can be met.

Predictability of cash flows

The cash flows generated for debt providers and equity investors are predictable;

The cash flows generated for debt providers and equity investors shall not be considered predictable unless all except an immaterial part of the revenues satisfies the following conditions:

(a) one of the following criteria is met:

(i) the revenues are availability-based;

(ii) the revenues are subject to a rate-of-return regulation;

(iii) the revenues are subject to a take-or-pay contract;

(iv) the level of output or the usage and the price shall independently meet one of the following criteria:

– it is regulated;

– it is contractually fixed;

– it is sufficiently predictable as a result of low demand risk;

(b) where the revenues are not funded by payments from a large number of users, the party which agrees to purchase the goods or services provided by the infrastructure project shall be one of the following:

(i) an entity listed in Article 180(2) of this Regulation;

(ii) a regional government or local authority listed in the Regulation adopted pursuant to Article 109a(2)(a) of Directive 2009/138/EC;

(iii) an entity with an ECAI rating with a credit quality step of at least 3;

(iv) an entity that is replaceable without a significant change in the level and timing of revenues.

Contractual framework

The infrastructure project is governed by a regulatory or contractual framework that provides debt providers and equity investors with a high degree of protection including the following:

(a) provisions that effectively protect debt providers and equity investors against losses resulting from the termination of the project by the party which agrees to purchase the goods or services provided by the infrastructure project unless of one the following conditions is met;

(i) the revenues are funded by payments from a large number of users;

(ii) the revenues are subject to a rate-of-return regulation;

(b) there are sufficient reserve funds or other financial arrangements to cover contingency funding and working capital requirements of the project;

Where investments are in bonds or loans, this regulatory or contractual framework shall also include the following:

Option 1 (Security)

(i) debt providers have the benefit of security to the extent permitted by applicable law in all assets and contracts that are critical to the operation of the infrastructure project;

(ii) debt providers are able to take control of the operation of the infrastructure project prior to default through a direct pledge of equity or other equivalent controls;

Option 2 (Security)

(i) Debt providers have the benefit of security to the extent permitted by applicable law in all assets and contracts that are critical to the operation of the infrastructure project.

(ii) Notwithstanding point (i), where undertakings can demonstrate that security in all assets and contracts is not essential for debt providers to effectively protect or recover the vast majority of their investment, other security mechanisms may be used. In that case, the other security mechanisms shall comprise of one or more of the following:

(a) pledge of shares,
(b) step-in rights,
(c) lien over bank accounts,
(d) control over cash flows,
(e) provisions for assignment of contracts.

(iii) the use of net operating cash flows after mandatory payments from the

project for purposes other than servicing debt obligations is restricted;

(iv) restrictions on activities that may be detrimental to debt providers, including that new debt cannot be issued without the consent of existing debt providers in the form agreed;

Credit quality step (rated debt)

The instrument shall have a credit assessment of at least credit quality step 3

Financial risk

Where investments are in bonds for which a credit assessment by a nominated ECAI is not available, the investment instrument is senior to all other claims other than statutory claims, and claims from liquidity facility providers, trustees and derivatives counterparties.

Other requirements for unrated debt and equities

Where investments are in equities, or bonds or loans for which a credit assessment by a nominated ECAI is not available, the following criteria are met:

(i) the infrastructure assets and infrastructure project are located in the EEA or in the OECD;

(ii) where the infrastructure project is in the construction phase the following criteria shall be fulfilled by the equity investor, or where there is more than one equity investor, the following criteria shall be fulfilled by a group of equity investors as a whole:

– the equity investors have a history of successfully overseeing infrastructure projects and the relevant expertise;

– the equity investors have a low risk of default, or there is a low risk of material losses for the infrastructure project as a result of the their default;

– the equity investors are incentivised to protect the interests of investors;

(iii) where there are construction risks, safeguards are established to ensure completion of the infrastructure project according to the agreed specification, budget or completion date;

(iv) where operating risks are material, they are properly managed;

(v) tested technology and design is used;

(vi) the capital structure allows all of the debt to be serviced;

(vii) the refinancing risk is low;

(viii) derivatives are only used for risk-mitigation purposes.

10. Risk management

10.1. Analysis

1.187. During the first call for advice EIOPA recommended that additional risk management requirements should apply to qualifying infrastructure investments, for example regarding due diligence and stress testing. Based on these recommendations, the amendment to the Delegated Regulation included a new Article 261a.

1.188. EIOPA recognised that it had been possible to identify a class of infrastructure investments which warranted a different calibration. However, EIOPA argued that such investments can still present complex risks, which can vary substantially between different types of infrastructure projects. It was also highlighted that these will often be different to the risks that insurers are accustomed to managing.

1.189. The risk management requirements were intended to supplement the qualifying criteria and existing Solvency II risk management and governance requirements for investments, to ensure that undertakings manage the risks arising from their exposures to infrastructure investments over time. As described in Chapter 9, EIOPA believes that some changes can be made to the qualifying criteria for infrastructure projects. The criteria are, however, fundamentally the same and the intention to achieve an equivalent level of risk. EIOPA therefore considers that the requirements proposed in the first call for advice remain appropriate for infrastructure projects.

1.190. It is necessary to consider the application of risk management requirements to investments in infrastructure corporates. As described above, the risk profile of corporates may be different to projects. However, there can still be significant risk management challenges, be it due to the technical complexity or the ability to anticipate and mitigate the relevant contingencies. Some corporates may also assume construction risks. It is, therefore, paramount that for all infrastructure investments, both projects and corporates, undertakings have effective risk management systems in place. In view of this, EIOPA considers that the requirements to conduct adequate due diligence, regular stress testing, and to establish written monitoring procedures with a particular focus on construction risks, are applicable to corporates.

1.191. On the other hand, some of the risk management requirements included in the first call for advice are directly linked to the other specific requirements for projects, such as those included in the qualifying criteria, and thus may not be suitable for corporates. First, due to the importance and potential complexity of the qualifying criteria assessment, a requirement for a validation process was recommended for projects. For corporates the proposed criteria are less complex and therefore a validation process is not considered to be necessary. Similarly, the requirement to subject the financial model to a validation process

is also not considered to be necessary since corporates, compared to projects, are generally larger, and more well-established and diversified businesses.[30]

1.192. Second, a key aspect for projects was the evidence of higher recovery rates, resulting from the security provided to investors and the effective use of work-out scenarios as opposed to distressed sales. For corporates, there is no requirement for the debt to be secured and the evidence for the calibration is not based on recovery rates. Therefore, it does not appear to be justified to apply the requirement to establish procedures to maximise the amount recovered in a work-out scenario to corporates.

1.193. A third element of the criteria that is specific to infrastructure project investments is the requirement to hold the investment until maturity. While the ability to hold the investment to maturity was an assumption of the calibration for projects, this is not the case for corporates. Consequently, it is not proposed to apply this requirement to corporates.

Question 8 – risk management

(a) In view of the proposed change to the scope of the infrastructure project asset class, do you agree that the risk management requirements remain appropriate?

(b) In particular, will the information required to comply with the risk management requirements for infrastructure projects be available to insurers?

(c) If not, how would an insurer satisfy itself regarding the safety of the investment, without an excessive or mechanistic reliance upon external ratings?

10.2. Draft advice

1.194. The draft advice below is based on Article 261a of the Delegated Regulation.

1. Insurance and reinsurance undertakings shall conduct adequate due diligence prior to making a qualifying infrastructure investment. In the case of investments in qualifying infrastructure projects, this shall include all of the following:

(a) a documented assessment of how the project satisfies the criteria set out in Article 164a, which has been subject to a validation process, carried out by persons that are free from influence from those persons responsible for the assessment of the criteria, and have no potential conflicts of interest with those persons;

(b) a confirmation that any financial model for the cash flows of the project has been subject to a validation process carried out by persons that are free from influence

[30] EIOPA proposes requirements regarding diversification and minimum duration of operations for infrastructure corporates – see Chapter 8.

from those persons responsible for the development of the financial model, and have no potential conflicts of interest with those persons.

2. Insurance and reinsurance undertakings with a qualifying infrastructure investment shall regularly monitor and perform stress tests on the cash flows and collateral values supporting the investment. Any stress tests shall be commensurate with the nature, scale and complexity of the risk inherent in the investment.

3. Where insurance or reinsurance undertakings hold material qualifying infrastructure investments, they shall, when establishing the written procedures referred to in Article 41(3) of Directive 2009/138/EC, include provisions for an active monitoring of these investments during the construction phase, and in the case of investments in qualifying infrastructure projects for a maximisation of the amount recovered from these investments in case of a work-out scenario.

4. Insurance or reinsurance undertakings with a qualifying infrastructure project investment in bonds or loans shall set up their asset-liability management to ensure that, on an ongoing basis, they are able to hold the investment to maturity.

Annex I: Impact assessment

Section 1: Procedural issues and consultation of interested parties

On 14 October 2015, EIOPA received a call for advice from the Commission to provide technical advice on the identification and calibration of infrastructure investment risk categories other that infrastructure projects, i.e. infrastructure corporates.

In the request for technical advice the Commission requested a cost-benefit analysis. The analysis of costs and benefits is undertaken according to an Impact Assessment methodology.

Prior to October 2015 EIOPA had been working on infrastructure investments by insurers based on a previous call for advice from the Commission. In response to this previous call for advice, EIOPA proposed a differentiated treatment within Solvency II for investments in infrastructure projects that meet a series of qualifying criteria designed to identify safer, higher quality investments. During the public consultation on that draft advice (EIOPA CP 15/004), EIOPA also received feedback from stakeholders on the treatment of infrastructure corporates.[31]

Following the receipt of the latest call for advice, between 19 November and 10 December, EIOPA issued a call for evidence[32] to request information on the nature and risk profile of infrastructure corporates and in particular any empirical evidence regarding their performance. EIOPA also analysed relevant market and academic studies.

The draft technical advice and its Impact Assessment are now subject to public consultation.

Section 2: Problem definition

The Solvency II framework currently does not lay down a specific treatment for infrastructure corporates, and therefore such investments would normally be treated as any other equity or corporate debt investment.

EIOPA has been tasked to consider whether the existing Solvency II requirements, in particular those concerning the standard formula approach to determine an undertaking's SCR, are sufficiently risk sensitive to reflect the risk of investments in infrastructure corporates.

This work reflects the aim of the Commission, as part of the CMU, to promote increased investment in Europe through *inter alia* the removal of barriers to investment, such as those arising from regulatory requirements. It is also reflects arguments made by a range of stakeholders that infrastructure as an asset class, has a number of beneficial features compared to other types of corporate exposures. This

[31] See Final Report to CP 15/004
[32] The responses can be found here

includes, for example, high barriers to entry and limited competition, a high degree of predictability of cash flows based on long-term contracts, and limited correlation to other economic factors.

At the same time, in order to justify any change to the existing Solvency II requirements, it is necessary for EIOPA to identify evidence that the revised calibration still meets the requirement set out in Article 101(3) of Directive 2009/138/EC. In the case of infrastructure, there can be challenges because a significant proportion of investments are private, unlisted assets, as well as often long-term in nature. There are also challenges in relation to the definition of infrastructure corporates, since they may conduct a range of activities, not all of which may conform to the definition of infrastructure assets[33].

Therefore, in analysing the risk of infrastructure corporates, it is necessary for EIOPA to consider in particular the following:

- In accordance with Directive 2009/138/EC the regulatory capital requirements should be set at a level such that undertakings will be in a position, with a probability of at least 99.5 %, to meet their obligations to policy holders and beneficiaries over the following 12 months.

- Solvency II lays down a standard formula approach for the calculation of the Solvency Capital Requirement, which is intended to reflect the risk profile of most insurance and reinsurance undertakings. Bearing in mind the situation of small and medium, sized undertaking in particular, the standard formula approach should not be overly complex.

Baseline

When analysing the impact from proposed policies, the Impact Assessment methodology foresees that a baseline scenario is applied as the basis for comparing policy options. This helps to identify the incremental impact of each policy option considered. The aim of the baseline scenario is to explain how the current situation would evolve without additional regulatory intervention.

The baseline for this Impact Assessment Report is based on the current situation of EU insurance and reinsurance markets, taking account of the implementation of the Solvency II framework by insurance and reinsurance undertakings and supervisory authorities. In particular the baseline includes:

- The content of Directive 2009/138/EC, as amended by Directive 2014/51/EU;
- The Solvency II Delegated Regulation (2015/35/EU) and the amendment to that regulation adopted by the Commission on 30 September 2015.

Section 3: Objectives

[33] In the first call for advice, EIOPA recommended the following definition of infrastructure assets "physical structures or facilities, systems or networks that provide or support essential public services".

Objective 1: To define risk sensitive capital requirements for investments in infrastructure corporates in line with the 99.5 % VaR measure provided for by Article 101 of Directive 2009/138/EC

Objective 2: To develop criteria to be used to clearly define infrastructure corporates and provide for a consistent interpretation by supervisory authorities and undertakings

Objective 3: To facilitate effective due diligence and risk management systems in undertaking in relation to infrastructure investments

These objectives are consistent with the following objectives for Directive 2009/138/EC:

- advance supervisory convergence,
- improved risk management of EU undertakings, and
- better allocation of capital resources.

They are also consistent with objective of increased financing for infrastructure investments and sustainable growth included in the Commission's Action Plan on Building a Capital Markets Union.

Section 4: Policy options

With the intention to meet the objectives set out in the previous section and based on the analysis of the available evidence regarding infrastructure corporates, EIOPA has considered to the following issues:

(1) The scope of a separate asset class for equity in infrastructure corporates within the SCR standard formula
(2) The nature of the definition and qualifying criteria for infrastructure corporates
(3) Whether the scope of the infrastructure project asset class should be amended

EIOPA has not yet completed its analysis of infrastructure corporate bonds. Therefore, the options regarding the treatment of infrastructure corporate debt are not discussed at this stage, but will be evaluated before the finalisation of the advice.

In the context of the above issues, the following options have been analysed:

Policy issue 1: Whether there should be a separate asset class for equity in infrastructure corporates within the SCR standard formula

- Option 1.1: a new asset class for equity investments in listed infrastructure corporates (listed equity - medium scope)
- Option 1.2: a new asset class for equity investments based on a lower risk subset of listed infrastructure corporates (lowest risk equity - narrow scope)

- Option 1.3: a new asset class for equity investments in listed and unlisted infrastructure corporates (listed and unlisted equity - broad scope)

Policy issue 2: The nature of the definition and qualifying criteria for a new asset class of infrastructure corporates

- Option 2.1: Develop a precise description of the necessary features based on the entities analysed
- Option 2.2: Develop risk-based criteria based on the risk characteristics of the entities analysed
- Option 2.3: Develop a definition based on certain necessary features supplemented with several risk-based criteria (combined solution)

Policy issue 3: Whether the scope of the infrastructure project asset class should be amended

- Option 3.1: Change only the definition of infrastructure project entity to allow for other structures besides project financing (i.e. SPV)
- Option 3.2: Change the definition of infrastructure project entity and revise the requirements regarding the security package (option 3.1 + additional changes)

Risk management requirements

EIOPA also recommends some risk management requirements for infrastructure corporates. EIOPA is not proposing any new requirements in addition to those recommended for projects. In view of this no alternative options were considered.

Section 5: Analysis of impacts

Policy issue 1: The scope of a separate asset class for equity in infrastructure corporates within the SCR standard formula

The analysis of equity price data of listed equities in infrastructure corporates indicates that the risk is lower than implied by the current standard formula risk charges for infrastructure corporates. The analysis is primarily based on a portfolio of infrastructure corporate equities, for which the empirical VaR 99.5 % based on 12-month returns between 2000 and 2015 was roughly 36 %. The current standard formula risk charges are 39 % (type 1 – listed equities) and 49 % (type 2 – unlisted equities).

Impact on undertakings, supervisory authorities and policy holders

A more granular treatment for infrastructure corporates within the SCR standard formula should result in higher risk sensitivity. This should provide for a more efficient allocation of capital. It also supports the objective of increased investment in infrastructure by reducing the regulatory barriers. A wider scope to the asset class is more likely to have a greater impact in increasing investment.

In terms of the impact on policy holders, it is also necessary to analyse the effects of changes on the overall level of risk charges of the standard formula in order to ensure that there is not a reduced level of policy holder protection. Improved risk sensitivity of the standard formula should in theory lead to higher risk charges for certain asset than those currently applied. Thus, a differentiated treatment for a higher quality subset of an existing asset class (e.g. infrastructure), would imply that the average risk of the remaining assets in that asset class increases. This assessment would depend on the materiality of the subset that is extracted from the existing asset class. In the case of infrastructure, EIOPA does not consider the impact to be material because of the relatively small size of the asset class compared to investments in equity, bonds and loans as a whole.

It can also be noted that the scheduled review of the methods, assumptions and standard parameters used when calculating the SCR with the standard formula prior to 2018[34] should be an occasion to perform a more holistic analysis on the adequacy of the overall structure and risk charges.

At the same time, policy issue 1 entails costs for insurers and supervisory authorities. There are costs arising from the additional complexity and tasks associated with the introduction of a specific infrastructure corporate asset category. There are costs to assess compliance with the new requirements, since the boundary between the new and existing asset categories may not be straightforward. There may also be a need to require additional information to be reported by undertakings. For insurers, the costs are balanced against the benefits provided by the more efficient allocation of capital.

Impact of option 1.1: a new equity asset class for equity investments in listed infrastructure corporates

EIOPA's analysis is based on listed equities due to the limited availability of evidence of private placements. If a direct connection between the data set and the calibration is considered paramount then an option based on listed equities would be preferred. The entities which EIOPA has selected for analysis benefit on average from a high degree of diversification in terms of geography and activities, which may not be the case of private placements. They may also be less leveraged than privately held investments. It can also be noted that CEIOPS advice for the Level 2 Implementing Measures on Solvency II in 2010 recommended a different treatment of unlisted and listed equities based on the results for a listed proxy for private equity investments. Therefore, as a general starting point, the current standard formula approach is to consider unlisted entities as of higher risk than listed entities.

However, if the data analysed is only considered to be a representative of the risk of listed infrastructure corporates, it is not clear that this justifies a change from the current standard formula risk charges, given the costs outlined above. The observed 36 % is relatively close to the 39 % risk charge for listed equities. There is also

[34] See recital 150 of the Delegated Regulation

dispersion in risk between different sectors of the listed equities analysed (e.g. defensive and cyclical).

Impact of option 1.2: a new asset class for equity investments based on a lower risk subset of those analysed

Since it may not be warranted to create a new asset class for listed equities with a risk charge which is not materially below 39 %, EIOPA considered whether there is a subset of infrastructure corporates which display a meaningfully lower risk than the whole set. The equities of the companies in the energy transmission and distribution sectors, as well as the stocks of water utilities, displayed on average lower volatility. This evidence could be used to support a differentiated treatment for entities with similar revenue mechanisms.

However, in this case the calibration would also have to be based on a very small sample size, and in addition, stakeholders indicated that they are also interested in corporates which have a limited exposure to merchant risk.

Impact of option 1.3: a new asset class for equity investments in listed and unlisted infrastructure corporates for a relatively broad range of infrastructure sectors

For unlisted equities, there is a meaningful difference between the risk observed of 36 % and the risk charge in the standard formula of 49 %. EIOPA therefore considered whether the listed corporates analysed can represent an adequate proxy for unlisted corporates. Despite the considerations set out under option 1.1, EIOPA believes there are some convincing arguments why the corporates selected are a suitable proxy for unlisted equities. In principle the risk of an entity should not depend on whether it is listed or not. Secondly, where listed entities display a better risk profile, this is arguably due to the greater stability of the cash flows. This stems from the "protected" revenues due to contractual arrangements, regulation or the fact that the infrastructure entity provides essential services combined with barriers to entry. It is not determined by whether or not they are listed. It should also be possible to develop criteria to capture the characteristics of the listed proxies that contribute to their better risk profile, for example by requiring diversified revenues, predictability of revenues, a minimum number of years of operation, and a reasonable degree of leverage.

Policy issue 2: The nature of the definition and qualifying criteria for infrastructure corporates

It is necessary to evaluate the most appropriate means to ensure that qualifying investments are limited to those entities with a risk profile that is comparable to the entities used during the calibration analysis. EIOPA judged that there were three main options for developing criteria to capture suitable investments.

Impact of option 2.1: Develop a precise description of the necessary features based on the entities analysed

This option is to identify the easily observable features of the entities that were analysed. This provides for a very close link between the entities that were used for the calibration analysis and the entities that should then qualify for the corresponding SCR treatment. In theory, with this option there is a limited risk that the entities which qualify are different in risk profile to those that were the basis of the calibration.

Nevertheless, this may also unnecessarily exclude certain investments. The absence of entities performing certain activities from the list of entities that EIOPA analysed does not necessarily mean that the risks arising from such activities are higher. There are, for example, operators of tunnels with listed equities that are therefore included in the list of entities analysed, while it was not possible to identify any listed bridge operator. However, there is no reason to believe that a bridge is per se of higher risk than a tunnel. EIOPA was also not able to identify any social infrastructure corporate with listed equities, but is aware from its previous analysis of infrastructure projects that certain types of social infrastructure can have relatively low risk.

Impact of option 2.2: Develop risk-based criteria based on the risk characteristics of the entities analysed

This option is to develop risk-based criteria, which seek to capture the underlying properties of infrastructure corporates that determine the nature of the risk. The advantage of this option is that it provides for a risk sensitive approach, which should not result in the inadvertent elimination of suitably high quality investments. However, for the standard formula approach, there should also not be undue complexity in the requirements.

It can also be noted that this option would be similar to the approach taken for EIOPA's advice on infrastructure projects. However, one reason for that approach was the proprietary nature of the Moody's database on project loans, which meant that EIOPA had limited information about the individual properties of the projects. In contrast, there is a reasonably large amount of information available for infrastructure corporates that issue bonds or are listed on a stock exchange.

Option 2.3: Develop a definition based on certain necessary features supplemented with several risk-based criteria (combined solution)

This option combines some precise features, such as to specify the sectors that can qualify, with what are considered to be the main drivers of risks (the revenues mechanisms and financial structure). This rationale for this is that the observable properties (e.g. the type of activities that an entity performs or whether or not is listed) alone may not be sufficient to separate lower and higher risk investments. For example, the risk of a corporate that generates power will depend largely on the mechanisms (contracts, markets, regulations) that determine prices and volumes, rather than the fact that is generates power.

Impact on undertakings, supervisory authorities and policy holders

The precise description approach (option 2.1) is unlikely to have a significant impact in supporting the objective of increased investment in infrastructure. Purely risk-based criteria (option 2.2) should better support this objective. Option 2.3 involves specifying a reasonably broad range of sectors and is therefore considered to support the objective of increased investment in infrastructure as well. Stakeholders are also being asked during the public consultation if suitable sectors have inadvertently been excluded.

Risk-based criteria are by nature more subjective, i.e. option 2.2 and to some extent option 2.3. This creates a risk of divergent application across Member States and to the protection of policy holders if the risk of an investment is not properly evaluated. In addition, there may be higher costs for undertakings and supervisory authorities to verify compliance with risk-based criteria compared to precise requirements[35] as would be the case for option 2.1. These costs and risks would be higher for option 2.2 than option 2.3, since the latter contains only a number of risk-based criteria.

Policy issue 3: Whether the scope of the infrastructure project asset class should be amended

Stakeholders have argued that other types of financing structures, such as corporates, can exhibit a similar profile to infrastructure projects financed using an SPV structure. It is stated for example that the underlying assets and thus revenue predictability can be the same. Therefore, it is contended that a "substance over form" approach should be taken which does not incentivise one structure over another. EIOPA's intention in considering the options below was to assess whether changes to the criteria for infrastructure projects could be made, whilst maintaining an equivalent level of risk and thus allowing for the same calibration to be used.

Impact of option 3.1: Change only the definition of infrastructure project entity to allow for other structures besides project financing (i.e. SPVs)

The recommendations during the first call for advice were based on evidence for infrastructure projects financed by SPVs. The restriction to SPV financing therefore provides a direct link between the evidence used for the purpose of the calibration and the qualifying entities. The removal of this link creates the possibility that entities which are not sufficiently similar in their risk profile can qualify.

A single SPV financing structure also has some advantages in terms of providing for a clear separation of the assets from other entities and a relatively simple structure. An expansion of the scope therefore has the potential to increase costs for supervisory authorities to verify compliance with the qualifying criteria.

Nevertheless, from a risk-based perspective, the key features of the higher quality infrastructure investments that EIOPA identified during the first call for advice were, amongst other things, the higher predictability of revenues and the protection

[35] Examples of precise requirements would be regarding the minimum size of the company or a requirement to be listed.

mechanisms for investors which lead to higher recovery rates. In theory these features are not limited to project financing. Therefore, provided these qualifying criteria remain fundamentally the same, the risk of unsuitable, higher risk investments being able to qualify, and thus the risk to policy holder protection, is considered to be minimal.

Impact of option 3.2: To change the definition of infrastructure project entity and also revise the requirements regarding the security package

EIOPA considered whether it was appropriate to revise the requirement for infrastructure projects that the investor has security "to the extent permitted by law in all assets and contracts necessary to operate the project". The rationale for this requirement is evidence that secured debt holders have significantly higher recovery rates than unsecured debt holders. Stakeholders argued that when other types of financing structures are used this this requirement would not be met, but that alternative security mechanisms are possible which provide an equivalent level of protection to the investor.

The existing requirement for projects provides the highest level of security that the investor will be in a position to protect or recover as much of their capital as possible, in all possible circumstances. It is also considered to provide clarity as to what is required. However, it does not provide for any flexibility and it risks eliminating investments that are of a suitably high quality. This would not be the case if a more principled based approach was taken.

Impact on undertakings, supervisory authorities and policy holders

Since EIOPA judges that changes can be made whilst providing for an equivalent level of risk, both options are considered to ensure a high level of policy holder protection consistent with the requirements of Directive 2009/138/EC. It can be acknowledged that option 3.2 introduces an element of subjectivity into the assessment. It therefore also increases the risk of misjudgements regarding the degree of safety provided by a particular security mechanism, and thus to the protection of policy holders, if the risk of an investment is not properly evaluated. This approach also may result in higher compliance costs for undertakings and supervisory authorities.

However, this is balanced against the impact of this change in terms of supporting the aim of increased investment in infrastructure. The existing qualifying criteria were designed specifically for the features of SPV financing. Based on discussions with stakeholders, a change only to the definition of "infrastructure project entity" is unlikely to increase the number of eligible investments.

Impact of the risk management requirements

EIOPA stated in the first call for advice that the proposals for risk management requirements do not add substantive new requirements, but rather apply or provide additional specification regarding existing Solvency II requirements. EIOPA therefore considered that the additional costs for undertakings arising from the proposals

compared to Directive 2009/138/EC and the Delegated Regulation were minimal. EIOPA therefore considers that the application of some of these requirements to investments in infrastructure corporates also results in minimal costs, whilst providing the benefit, in particular to policy holders, of promoting effective risk management.

Section 6: Comparing the options

On policy issue 1 (The scope of a separate asset class for equity in infrastructure corporates within the SCR standard formula), EIOPA recommends option 1.3 (*a new equity asset class for listed and unlisted equities investments in a relatively broad range of infrastructure sectors).* Bearing in mind the cost and complexity associated with introducing a specific treatment, as well as the aim to have a meaningful impact in terms of potentially qualifying investments, EIOPA considered option 1.1 and 1.2 to not be viable. EIOPA judged that option 1.3 can be prudentially justified based on the analysis conducted on the equity prices of infrastructure corporates and therefore should result in more risk sensitive capital requirements.

On policy issue 2 (the nature of the definition and qualifying criteria) EIOPA proposes option 2.3 (a definition based on certain necessary features supplemented with several risk-based criteria) with the aim to strike a balance between risk-sensitivity and undue complexity. This limits the costs to undertakings and supervisory authorities and the risk of divergent interpretations, which arise from having more subjective criteria. However, it provides for a higher degree of policy holder protection than a purely descriptive approach, since some risk based criteria are necessary to eliminate potentially riskier investments. This is because the lower risk of qualifying infrastructure equity investments does not result primarily from the particular characteristics of the assets, but from low demand risk due to the contracts arrangements, relevant regulations or the fact that essential services are provided with barriers to entry, plus the existence of a reasonable finance structure.

On policy issue 3 (whether the scope of the infrastructure project asset class should be amended), EIOPA proposes option 3.2 (change the definition of infrastructure project entity and also revise the requirements regarding the security package). Option 3.1 is not considered to have a meaningful impact in terms of additional suitable qualifying investments and thus is not considered to justify the implementation costs. EIOPA proposes to revise the definition to allow non-SPV financing structures to qualify and to provide for a more principles based approach requirement regarding the security package. These have the benefit of providing additional flexibility to undertakings, whilst they are still deemed to provide an equivalent level of risk. A number of other minor drafting changes are also proposed to the qualifying criteria for projects, which are not considered to have a substantive impact.

Questions

1. Do you agree with the assessment of benefits? Are there other benefits that have not been identified?

2. Do you agree with the assessment of costs? Are there other costs that have not been identified?

3. Regarding policy issue 1, what would be the volume of qualifying infrastructure investments under the different policy options?

Annex II: List of questions to stakeholders

Question 1: unlisted assets

(a) Do you agree that in the absence of publicly available data on unlisted infrastructure assets; the data on listed entities analysed by EIOPA are an appropriate proxy?

(b) If not, please provide a comprehensive justification and supporting evidence, including data, International Securities Identification Numbers (ISIN) codes and examples.

Question 2 - telecoms

(a) Do you agree with the assessment of the risks of telecom investments as evidenced by the historical price data?

(b) Are there any segments within the telecom industry that are safer than other segments, which deserve further granular analysis? If yes, please provide a comprehensive justification and supporting evidence including data, ISIN codes and examples.

Question 3 – debt without an ECAI rating

(a) What is the volume of infrastructure corporates without an ECAI rating?

(b) What is the typical amount of a corporate debt issuance? How does this relate to the cost of obtaining an ECAI rating?

(c) What criteria could be used to identify suitable debt without an ECAI rating and to eliminate unsuitable investments? Please provide specific proposals.

Question 4 – definition of infrastructure corporate

(a) Do you have specific examples of infrastructure sectors and corporate structures that would inadvertently fall outside this definition?

(b) What volumes would such examples represent?

(c) Regarding the requirement for a minimum number of years of operation or for an external credit assessment specifically, are there cases where would this lead to the exclusion of safer infrastructure corporates? If so, how would you propose to appropriately limit the construction or operating risks; would the requirements for infrastructure projects be appropriate for example?

Question 5 – other criteria for infrastructure corporates

Are there other criteria not covered by this section (Section 8.4) that are used by investors to identify safer infrastructure corporates?

Question 6 – identifying different revenue streams

Do you envisage any difficulties to distinguish between revenues stemming from infrastructure compared to non-infrastructure activities? Please justify your response.

Question 7 – security and negative pledge

(a) Would option 1 (compared to option 2) lead to the exclusion of arrangements which provide an equivalent level of protection to asset security and an equity pledge? Please provide specific reasons and examples.

(b) Do you consider that a "negative pledge" clause can provides equivalent protection to the security arrangements required by the proposals in Section 9.3?

(c) If yes, please provide specific reasons and examples of infrastructure sectors and countries where a "negative pledge" should be allowed without compromising the safety and recovery of your investment.

Question 8 – risk management

(a) In view of the proposed change to the scope of the infrastructure project asset class, do you agree that the risk management requirements remain appropriate?

(b) In particular, will the information required to comply with the risk management requirements for infrastructure projects be available to insurers?

(c) If not, how would an insurer satisfy itself regarding the safety of the investment, without an excessive or mechanistic reliance upon external ratings?

Question 9 - impact assessment

(a) Do you agree with the assessment of benefits? Are there other benefits that have not been identified?

(b) Do you agree with the assessment of costs? Are there other costs that have not been identified?

(c) Regarding policy issue 1, what would be the volume of qualifying infrastructure investments under the different policy options?

Annex III: Composition of the portfolio of listed infrastructure equity

The portfolio of listed infrastructure equity described in Section 6.2 consists of the following companies.

- AT0000911805 (FLUGHAFEN WIEN AG)
- DE0005767909 (FERNHEIZWERK NEUKOELLN AG)
- DE0005773303 (FRAPORT AG FRANKFURT AIRPORT)
- DE0005853808 (GASANSTALT KAISERSLAUTERN AG)
- DE0007760001 (GELSENWASSER AG)
- DE000A0S8488 (HAMBURGER HAFEN UND LOGISTIK)
- AT0000741053 (EVN AG)
- AT0000746409 (VERBUND AG)
- AT0000824503 (VORARLBERGER KRAFTWERKE AG)
- BE0003822393 (ELIA SYSTEM OPERATOR SA/NV)
- CH0004699440 (STA ELETTRICA SOPRACENER-REG)
- CH0016405836 (RAETIA ENERGIE AG-BR)
- CH0034389707 (ALPIQ HOLDING AG-REG)
- CH0039651184 (ENERGIEDIENST HOLDING AG-REG)
- CH0130293662 (BKW AG)
- CZ0005076950 (VYCHODOCESKA ENERGETIKA)
- CZ0005077057 (JIHOCESKA ENERGETIKA)
- CZ0005077354 (ZAPADOCESKA ENERGETIKA)
- CZ0005077958 (JIHOMORAVSKA ENERGETIKA)
- CZ0005078055 (SEVEROCESKA ENERGETIKA)
- CZ0005112300 (CEZ AS)
- DE0005220008 (ENBW ENERGIE BADEN-WUERTTEMB)
- DE0006012008 (VATTENFALL EUROPE AG)
- DE0006458003 (LECHWERKE AG)
- DE0007037129 (RWE)
- DK0010240514 (GREENTECH ENERGY SYSTEMS)
- ES0173093115 (RED ELECTRICA CORPORACION SA)
- FI0009900369 (LANSIVOIMA OYJ)
- FR0000031023 (ELECTRICITE D'STRASBOURG-REG)
- FR0010242511 (EDF)
- GB0007908733 (SSE)
- GRS434003000 (PUBLIC POWER CORP)
- IT0000076445 (SONDEL-SOCIETA NORDELETTRICA)
- IT0001207098 (ACEA SPA)
- IT0001233417 (A2A SPA)
- IT0003242622 (TERNA SPA)
- LT0000128415 (LITGRID AB)
- LU0093533643 (CEGEDEL)
- PLKGNRC00015 (KOGENERACJA)
- PLPGER000010 (PGE SA)
- PLTAURN00011 (TAURON POLSKA ENERGIA SA)

- PTEDP0AM0009 (EDP-ENERGIAS DE PORTUGAL SA)
- DE000VTG9999 (VTG AG)
- DK0010201102 (KOBENHAVNS LUFTHAVNE)
- ES0116870314 (GAS NATURAL SDG SA)
- ES0130960018 (ENAGAS)
- ES0136463017 (FERSA ENERGIAS RENOVABLES SA)
- FR0004016699 (MARSEILL TUNNEL PRADO-CARENA)
- FR0010047928 (ALTERGAZ SA)
- FR0010340141 (ADP)
- FR0010400143 (EDF ENERGIES NOUVELLES SA)
- FR0010533075 (GROUPE EUROTUNNEL SE - REGR)
- FR0011995588 (VOLTALIA-REGR)
- GB00B08SNH34 (NATIONAL GRID PLC)
- GB00B0978K75 (BRISTOL WATER GROUP PLC)
- GB00B18V8630 (PENNON GROUP PLC)
- GB00B1FH8J72 (SEVERN TRENT PLC)
- GB00B39J2M42 (UNITED UTILITIES GROUP PLC)
- IT0000060886 (FNM SPA)
- IT0000068889 (MEDITERRANEA DELLE ACQUE SPA)
- IT0000084043 (AUTOSTRADE MERIDIONALI SPA)
- IT0000086022 (ACQUEDOTTO DE FERRARI)
- IT0001382024 (ACSM COMO SPA)
- IT0003153415 (SNAM SPA)
- IT0003201198 (SIAS SPA)
- IT0003506190 (ATLANTIA SPA)
- IT0004095888 (BIANCAMANO SPA)
- JE00B3B67P11 (RENEWABLE ENERGY GENERATION)
- PLPLSEP00013 (POLISH ENERGY PARTNERS SA)
- PTBRI0AM0000 (BRISA-AUTO-ESTRADAS PORTUGAL)
- ROTGNTACNOR8 (TRANSGAZ SA MEDIAS)

Annex IV: List of companies for the portfolio of selected infrastructure corporate bonds

Bonds issued by the companies listed below were included in the portfolio of infrastructure corporate bonds described in Section 7.2.

- HOLDING D'INFRA
- ACEA SPA
- AEROPORT PARIS
- AEROPORTI ROMA
- A2A SPA
- AER RIANTA FIN
- AGBAR INT BV
- ALLIANDER
- ALLIANDER FIN
- AUTOROUTES PARIS
- ASM BRESCIA
- ATLANTIA
- AUTOSTRADE
- AVINOR AS
- ANGLIAN WATER
- BAA PLC
- ENBW
- BIRKA ENERGI AB
- BORD GAIS
- BRISA CONCESSAO
- TRANSCO PLC
- BRISA FINANCE BV
- AREVA SA
- CENTRICA PLC
- CESKE DRAHY
- CENTRICA PLC
- CANAL DE ISABEL
- COFIROUTE
- DAA FINANCE PLC
- DONG A/S
- DEUTSCH BAHN
- DEUTSCH BAHN FIN
- COFIROUTE
- AUTOROUTES DU SU
- ELEC DE FRANCE
- EDISON SPA
- INTL ENDESA BV
- ELSAM A/S
- ENBW
- ENBW INTL FIN
- ENECO HOLDING NV

- ENEXIS HOLDING
- ENAGAS
- ENAGAS FIN SA
- E.ON INTER FIN
- EP ENERGY AS
- ESTAG FINANZ
- EESTI ENERGIA AS
- EUROGRID GMBH
- EVN ENERGIE-VERS
- EWE AG
- FERROV DEL STATO
- FINGRID OYJ
- 2I RETE GAS SPA
- GAS NATURAL CAP
- GAS NAT FENOSA F
- GROUPEMENT DES C
- GDF SUEZ
- HERA SPA
- HSE NETZ
- IBERDROLA FIN
- IBERDROLA INTL
- INFRABEL
- INFRAX CVBA
- KELAG-KAERNTNER
- YORKSHIRE WATER
- LINEA GROUP
- LYONNAI DES EAUX
- MADRILENA RED FI
- NEDERLANDSE GAS
- NET4GAS
- NATIONAL GRID
- NORTH W WAT FIN
- ENERGIE OBEROEST
- PGE SWEDEN AB
- PUBLIC PWR CORP
- POWERGEN
- RED ELE FIN BV
- REDEXIS GAS FIN
- RED ELECTRICA FI
- REN REDES ENERGE
- RHOEN-KLINIKUM
- RTE EDF TRANSPOR
- RWE FINANCE BV
- SANEF
- SCOTTISH POWER
- EDISON SPA
- SUEZ ENVIRON

- SEVERN TRENT FIN
- SIAS
- SOC NATL BELGES
- SNCF
- SPP INFRASTR
- SLOVENSKY PLYNAR
- SPP DISTRIBUCIA
- SNAM
- SCOTTISH & SOUTH
- STATKRAFT
- GIE SUEZ ALLIANC
- ELECTRABEL SA
- TENNET HLD BV
- THAMES WATER UTC
- TERNA SPA
- TIGF
- TEOLLISUUDEN VOI
- UNION FENOSA FIN
- UNITED UTIL WAT
- VATTENFALL TREAS
- VERBUND AG
- VINCI SA

Annex V: Methodology to compare the actual 12-month spread changes for the iBoxx Utilities index with the maximum changes implied by the standard formula

Basic idea

According to the Markit index methodology the annualised index benchmark spread for an index of bonds at time t is[36]

$$\sum_{i=1}^{n} BMS_{i,t}^{a} w_{i,t}^{D}$$

The weights are determined as follows:[37]

$$w_{i,t}^{D} = \frac{D_{i,t} MV_{i,t}}{\sum_{i=1}^{n} D_{i,t} MV_{i,t}}$$

where $MV_{i,t}$ denotes the market value of bond i at the time t and $D_{i,t}$ denotes the duration of bond i at the time t.

Using the assumption that bonds with the same duration and rating have the same spreads the annualised benchmark spread at the time t can be rewritten as[38]

$$\sum_{r=AA,A,BBB} \sum_{d=1}^{n} \frac{D_{r,d,t} MV_{r,d,t}}{\sum_{r=AA,A,BBB} \sum_{d=1}^{n} D_{r,d,t} MV_{r,d,t}} BMS_{r,d,t}^{a}$$

where

$$D_{r,d,t} = \sum_{\substack{rating(i)=r \\ duration(i)=d}} D_{i,t}$$

and

$$MV_{r,d,t} = \sum_{\substack{rating(i)=r \\ duration(i)=d}} MV_{i,t}$$

Using the definition

$$w_{r,d,t}^{D} = \frac{D_{r,d,t} MV_{r,d,t}}{\sum_{r=AA,A,BBB} \sum_{d=1}^{n} D_{r,d,t} MV_{r,d,t}}$$

this can be rewritten as

[36] Markit (2014): Markit iBoxx Bond Index Calculus, p. 25.
[37] Markit (2014): Markit iBoxx Bond Index Calculus, p. 24.
[38] This assumes that all maturities are integers. In practice one would of course "map" bonds to certain maturities.

$$\sum_{r=AA,A,BBB} \sum_{d=1}^{n} w_{r,d,t}^{D} \, BMS_{r,d,t}^{a}$$

In other words, the annualised benchmark spread is the duration weighted average of the annualised benchmark spreads for the different maturities and ratings. This means that higher durations have a higher weight.

For the time being it is assumed that $w_{r,d,t}^{D} = w_{r,d,t+1}^{D}$ for all r and d.

Under this assumption the change in the annualised index benchmark spread would be

$$\sum_{r=AA,A,BBB} \sum_{d=1}^{n} w_{r,d,t}^{D} \left(BMS_{r,d,t+1}^{a} - BMS_{r,d,t}^{a} \right)$$

In other words, the change in the annualised index benchmark spread is the duration weighted average of the spread changes for the different durations and ratings.

Article 176 of the Delegated Regulation sets out the risk charges for bonds. From this it is possible to deduct the "implied" spread risk shock under the 99.5 % scenario. The risk charge for a BBB bond with a modified duration of 4 years is, for example, the market value of the bond multiplied by modified duration multiplied by 2.5 %. This means the assumed expansion in the spread for bonds with a BBB rating is 2.5 %. For a BBB rated bond with a modified duration of 7 years the risk charge is

$$market\ value * \ (5 * 2.5\% + (7 - 5) * 1.5\%) = market\ value * 15.5\ \%$$

This means the assumed spread expansion is $\frac{15.5\%}{7} = 2.21\%$. For further considerations on this calculation please see the limitations of the approach below.

On this basis it is possible to calculate for all modified durations and credit quality steps the change in the spread $\Delta_{r,d}$ that is implied by the standard formula. If the spread risk charges in the standard formula are adequate for utility bonds in the iBoxx Utilities index the probability of a change in the annual index benchmark spread of more than

$$\sum_{r=AA,A,BBB} \sum_{d=1}^{n} w_{r,d,t}^{D} \left(\Delta_{r,t} \right)$$

("the 99.5 % change implied by the standard formula") should be not more than 0.5 %.

Limitations of the approach

One possible limitation is that due to the monthly rebalancing of the index the spreads of bonds downgraded to BB or below are not fully taken into account. Since taking into account downgrades would increase the volatility, this is only relevant if the

volatility of the spread changes over 12 months for the index is lower than implied by the standard formula.

Another limitation is that duration weights $w_{r,d,t}^{D}$ were assumed to be constant over a 12-month period. This is obviously a simplification. The annualised index benchmark spread could, for example, increase if many new BBB rated bonds are issued, which may also have a much longer duration than the ones that expire. Therefore, it is necessary to analyse the changes in the composition of the index. Below the changes in the composition of the iBoxx Utilities indices in terms of ratings and maturities are shown.

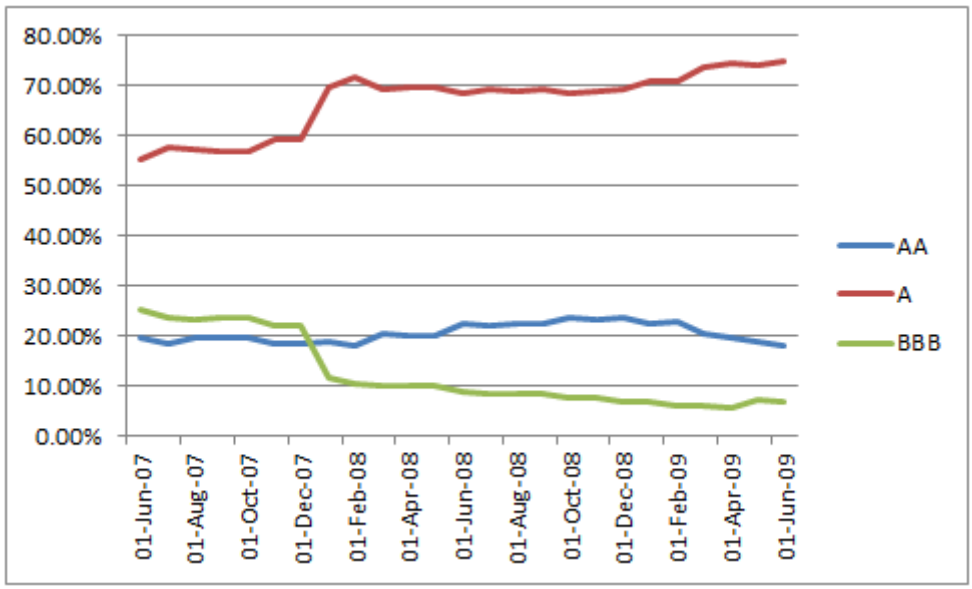

Figure 15: Composition iBoxx EUR Utilities in terms of ratings (market value weighted)

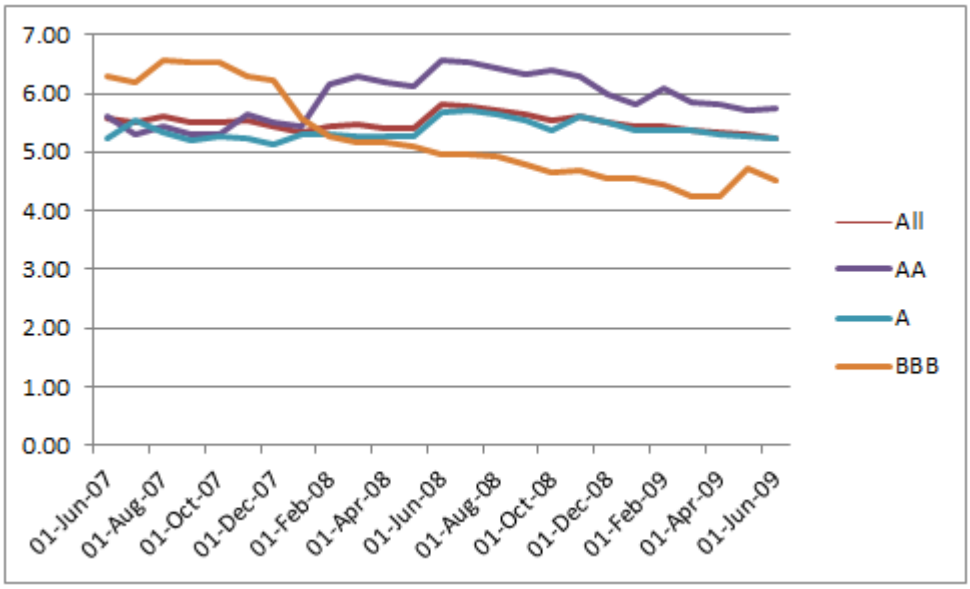

Figure 16: Composition iBoxx EUR Utilities in terms of maturities (market value weighted)

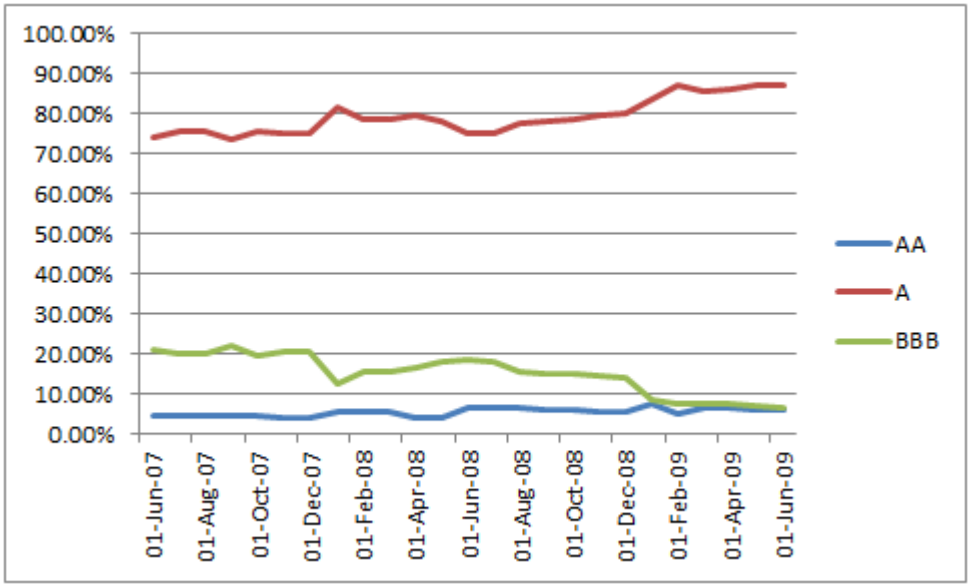

Figure 17: Composition iBoxx GBP Utilities in terms of ratings (market value weighted)

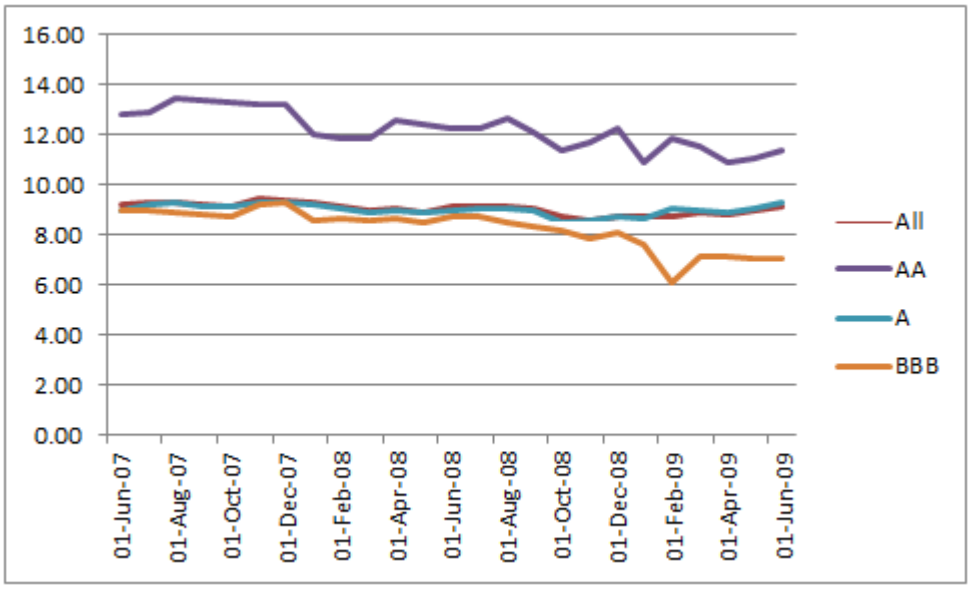

Figure 18: Composition iBoxx GBP Utilities in terms of maturities (market value weighted)

It can be seen that the composition in terms of rating classes actually improves as the share of BBB rated issues drops considerably. There is no downward trend in durations. The decreasing volatility implied by the standard formula (see Sub-section "Comparison between maximum expected and actual spread changes" within Section 7.3) can also be seen as an indication for a reduction in spread risk over time.

This seems to indicate that the spreads for the Utilities index with constant weights would be **higher** than the actual ones. As in the previous case the limitation is only relevant if the volatility in 12-month spread changes for the index is lower than implied by the standard formula

A third issue could be the calculation of the implied spread volatility for bonds with a modified duration of more than five years. The relevance depends of course on the proportion of bonds with a modified duration of more than five years. A simple solution could be to use for all modified durations the spreads implied by the treatment of bonds with modified duration of five years or less. This sets the "bar" lower by making it easier for the iBoxx Utilities indices to display lower spread volatility than implied by the standard formula.

Annex VI: Revisions to Article 1 points 55a, 55b, and Article 164a of the Delegated Regulation

This Annex displays the changes to Article 1 and Article 164a of the Delegated Regulation proposed by the draft advice in Section 9.3 on scope and criteria for infrastructure projects.

Article 1
Amending provisions

'55a. 'Infrastructure assets' means physical assets, structures or facilities, systems and networks that provide or support essential public services.

55b. 'Infrastructure project entity' means an entity or group which ~~is not permitted to perform any other function than~~ derives the vast majority of its revenues from owning, financing, developing or operating infrastructure assets.~~, where the primary source of payments to debt providers and equity investors is the income generated by the assets being financed.~~

Article 164a
Qualifying infrastructure investments

1. For the purposes of this Regulation, qualifying infrastructure investment shall include investment in an infrastructure project entity that meets the following criteria:

(a) ~~the infrastructure project entity can meet its~~ The cash flows generated by the infrastructure asset allow for all financial obligations to be met under sustained stresses that are relevant for the risk of the project;

The stress testing shall consider risks arising from non-infrastructure activities, but the revenues generated by such activities shall not be taken into account when determining whether the financial obligations can be met;

(b) the cash flows ~~that the infrastructure project entity generates~~ generated for debt providers and equity investors are predictable;

(c) the infrastructure ~~assets and infrastructure~~ project is ~~entity are~~ governed by a regulatory or contractual framework that provides debt providers and equity investors with a high degree of protection including the following:

(a) ~~where the revenues of the infrastructure project entity are not funded by payments from a large number of users, the contractual framework shall include~~ provisions that effectively protect debt providers and equity investors against losses resulting from the termination of the project by the party which agrees to purchase the goods or services provided by the infrastructure project entity unless one of the following conditions is met;

(i) the revenues are funded by payments from a large number of users

(ii) the revenues are subject to a rate-of-return regulation

(b) ~~the infrastructure project entity has~~ there are sufficient reserve funds or other financial arrangements to cover the contingency funding and working capital requirements of the project;

Where investments are in bonds or loans, this regulatory or contractual framework shall also include the following:

Option 1 (Security)

(i) debt providers have the benefit security to the extent permitted by applicable law in all assets and contracts that are critical to the operation of ~~necessary to operate~~ the project;

(ii) ~~equity is pledged to~~ debt providers ~~such that they~~ are able to take control of the operation of the infrastructure project ~~entity~~ prior to default through a direct pledge of equity or other equivalent controls;

Option 2 (Security)

(i) debt providers have the benefit security to the extent permitted by applicable law in all assets and contracts that are critical to the operation of ~~necessary to operate~~ the project;

~~(ii) equity is pledged to debt providers such that they are able to take control of the infrastructure project entity prior to default;~~

(ii) Notwithstanding paragraph 1, where undertakings can demonstrate that security in all assets and contracts is not essential for debt providers to effectively protect or recover the vast majority of their investment, other security mechanisms may be used. In that case, the other security mechanisms shall comprise of one or more of the following:

(a) pledge of shares,

(b) step-in rights,

(c) lien over bank accounts,

(d) control over cash flows,

(e) provisions for assignment of contracts

(iii) the use of net operating cash flows after mandatory payments from the project for purposes other than servicing debt obligations is restricted;

(iv) ~~contractual~~ restrictions on ~~the ability of the infrastructure project entity to perform~~ activities that may be detrimental to debt providers, including that new debt cannot be issued without the consent of existing debt providers in the form agreed;

(d) where investments are in bonds or loans, the insurance or reinsurance undertaking can demonstrate to the supervisor that it is able to hold the investment to maturity;

(e) where investments are in bonds for which a credit assessment by a nominated ECAI is not available, the investment instrument is senior to all other claims other than statutory claims and claims from liquidity facility providers, trustees, and derivatives counterparties;

(f) where investments are in equities, or bonds or loans for which a credit assessment by a nominated ECAI is not available, the following criteria are met:

(i) the infrastructure assets and infrastructure project ~~entity~~ are located in the EEA or in the OECD;

(ii) where the infrastructure project ~~entity~~ is in the construction phase the following criteria shall be fulfilled by the equity investor, or where there is more than one equity investor, the following criteria shall be fulfilled by a group of equity investors as a whole:

– the equity investors have a history of successfully overseeing infrastructure projects and the relevant expertise;

– the equity investors have a low risk of default, or there is a low risk of material losses for the infrastructure project ~~entity~~ as a result of the their default;

– the equity investors are incentivised to protect the interests of investors;

(iii) ~~the infrastructure project entity has established~~ where there are construction risks, safeguards are established to ensure completion of the project according to the agreed specification, budget or completion date;

(iv) where operating risks are material, they are properly managed;

(v) ~~the infrastructure project entity uses~~ tested technology and design is used;

(vi) the capital structure ~~of the infrastructure project entity~~ allows all of the ~~it to service its~~ debt ~~to be serviced~~;

(vii) the refinancing risk ~~for the infrastructure project entity~~ is low;

(viii) ~~the infrastructure project entity uses~~ derivatives are only used for risk-mitigation purposes.

2. For the purposes of paragraph 1(b), the cash flows generated for debt providers and equity investors shall not be considered predictable unless all except an immaterial part of the revenues satisfies the following conditions:

(a) one of the following criteria is met:

(i) the revenues are availability-based;

(ii) the revenues are subject to a rate-of-return regulation;

(iii) the revenues are subject to a take-or-pay contract;

(iv) the level of output or the usage and the price shall independently meet one of the following criteria:

– it is regulated;

– it is contractually fixed;

– it is sufficiently predictable as a result of low demand risk;

(b) where the revenues ~~of the infrastructure project entity~~ are not funded by payments from a large number of users, the party which agrees to purchase the goods or services provided by the infrastructure project ~~entity~~ shall be one of the following:

(i) an entity listed in Article 180(2) of this Regulation;

(ii) a regional government or local authority listed in the Regulation adopted pursuant to Article 109a(2)(a) of Directive 2009/138/EC;

(iii) an entity with an ECAI rating with a credit quality step of at least 3;

(iv) an entity that is replaceable without a significant change in the level and timing of revenues.

Annex VII: Revisions to Article 261a of the Delegated Regulation

This Annex displays the proposed changes to Article 261a of the Delegated Regulation proposed by the draft advice in Section 10.2 on risk management requirements.

Article 261a
Risk management for qualifying infrastructure investments

1. Insurance and reinsurance undertakings shall conduct adequate due diligence prior to making a qualifying infrastructure investment~~,~~. In the case of investments in qualifying infrastructure projects, this shall include ~~including~~ all of the following:

(a) a documented assessment of how the project satisfies the criteria set out in Article 164a, which has been subject to a validation process, carried out by persons that are free from influence from those persons responsible for the assessment of the criteria, and have no potential conflicts of interest with those persons;

(b) a confirmation that any financial model for the cash flows of the project has been subject to a validation process carried out by persons that are free from influence from those persons responsible for the development of the financial model, and have no potential conflicts of interest with those persons.

2. Insurance and reinsurance undertakings with a qualifying infrastructure investment shall regularly monitor and perform stress tests on the cash flows and collateral values supporting the investment ~~infrastructure project entity~~. Any stress tests shall be commensurate with the nature, scale and complexity of the risk inherent in the investment ~~infrastructure project~~.

3. Where insurance or reinsurance undertakings hold material qualifying infrastructure investments, they shall, when establishing the written procedures referred to in Article 41(3) of Directive 2009/138/EC, include provisions for an active monitoring of these investments during the construction phase, and in the case of investments in qualifying infrastructure projects for a maximisation of the amount recovered from these investments in case of a work-out scenario.

4. Insurance or reinsurance undertakings with a qualifying infrastructure project investment in bonds or loans shall set up their asset-liability management to ensure that, on an ongoing basis, they are able to hold the investment to maturity.

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