



# THE 4<sup>TH</sup> FACTOR

Underwriting for  
sustainable development  
in surety bonds

**A study on the integration of  
environmental, social, and governance  
risk factors into surety bond underwriting  
of infrastructure projects**

This PSI project was co-sponsored by:



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# Background

## About UN Environment’s Principles for Sustainable Insurance Initiative

Endorsed by the UN Secretary-General and insurance industry CEOs, the Principles for Sustainable Insurance (PSI) serve as a global framework for the insurance industry to address environmental, social and governance risks and opportunities—and a global initiative to strengthen the insurance industry’s contribution as risk managers, insurers and investors to building resilient, inclusive and sustainable communities and economies.

Developed by UN Environment’s Finance Initiative, the PSI was launched at the 2012 UN Conference on Sustainable Development (Rio+20), and has led to the largest collaborative initiative between the UN and the insurance industry. Nearly 120 organisations worldwide have adopted the four Principles for Sustainable Insurance, including insurers representing more than 25% of world premium volume and USD 14 trillion in assets under management.

The vision of the PSI Initiative is of a risk-aware world, where the insurance industry is trusted and plays its full role in enabling a healthy, safe, resilient and sustainable society. Its purpose is to better understand, prevent and reduce ESG risks, and to better manage opportunities to provide quality and reliable risk protection.

In December 2016, UN Environment—through its PSI Initiative and its Inquiry into the Design of a Sustainable Financial System—and insurance regulators and supervisors launched the Sustainable Insurance Forum for Supervisors (SIF). The SIF is an international network of insurance regulators and supervisors that aims to promote cooperation on critical sustainability challenges and opportunities.

[www.unepfi.org/psi](http://www.unepfi.org/psi)

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**“The Principles for Sustainable Insurance provide a global roadmap to develop and expand the innovative risk management and insurance solutions that we need to promote renewable energy, clean water, food security, sustainable cities and disaster-resilient communities.”**

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**Ban Ki-moon, UN Secretary-General (June 2012)**



## About this report

This report presents the findings of a study on the integration of environmental, social and governance (ESG) risk factors into surety bond underwriting of infrastructure projects. The study is based on a global survey and consultation on current underwriting practices of insurance and reinsurance companies.

Sponsored by Munich Re and the International Finance Corporation of the World Bank Group, the study was carried out by UN Environment's Principles for Sustainable Insurance Initiative (PSI) through an alliance of insurers, reinsurers and academics.<sup>1</sup>

The aim of this report is to contribute to the development of global guidance on the integration of ESG risks into insurance underwriting across lines of business and industry sectors, including surety bonds and infrastructure projects.

## The project

Infrastructure developments such as ports, bridges, hydroelectric plants, grids, pipelines, and tunnels entail substantial completion and performance risks. Since infrastructure projects are exposed to these risks, engineering, procurement, and construction (EPC) contractors are often required to provide completion guarantees. Such guarantees can take the form of surety bonds, a specialised line of business in the insurance industry.

A surety bond is defined as a three-party agreement that legally binds together a *principal* (contractor) who needs the bond, an *obligee* (project owner) who requires the bond, and an *obligor* (the surety, usually an insurance company) that sells the bond. The bond guarantees the principal will act in accordance with certain laws. If the principal fails to perform in this manner, the bond will cover resulting damages or losses.<sup>2</sup>

A surety bond is an efficient tool to select contractors and to increase the likelihood of project completion in the event of default (Al-Sobiei, Arditi, & Polat, 2005; Awad & Fayek, 2012). They are cost-effective and do not rely on the limited lending capacity of commercial banks.

In the insurance industry, underwriting is the process of evaluating, defining and pricing risks. Surety bond underwriting typically involves the assessment of the three C's: *capital* (financial strength), *capacity* (ability to perform the contract), and *character* (integrity, reliability and commitment to meet obligations). However, current practices in surety bond underwriting vary across companies and markets.

In this context, a global survey and consultation was carried out with the guiding principle that the integration of environmental, social and governance (ESG) risk factors into the surety bond underwriting process could benefit all stakeholders involved in construction projects, and contribute to economic, social and environmental sustainability—in other words, sustainable development.

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1 This PSI project was a collaborative effort involving UN Environment, Munich Re, the International Finance Corporation of the World Bank Group, Allianz, Generali, IAG, the International Credit Insurance & Surety Association (ICISA), the Panamerican Surety Association (PASA), the UTS Business School at the University of Technology Sydney, the Fox School of Business at Temple University, and West Chester University of Pennsylvania.

2 [www.suretybonds.com/surety-bond-definition.html](http://www.suretybonds.com/surety-bond-definition.html)



## Key findings

Four key findings emerged from the global survey and consultation.

### **1. ESG risk factors influence surety bond underwriting decisions**

A significant number of respondents agreed that ESG risks can be quantified, and that they influence underwriting. When underwriters were asked to indicate the extent to which they agreed with the statement, “I consider [this ESG risk] when underwriting surety bonds for infrastructure projects”, majority agreed that 12 of the 15 ESG risks surveyed influence their judgements.

### **2. ESG risks represent a “fourth C” in surety bond underwriting**

Existing research on surety bonds emphasises the capital, capacity, and character of the principal—the three C’s—as a means of predicting contract failure. However, survey responses suggest that assessing principals’ capacity and character also requires assessing ESG risks present in the environment. This is because assessments of contractors’ and principals’ capacity and character are obscured by the moral hazard that comes from their self-reporting of ESG risk management. Therefore, the ESG risks at play in any infrastructure project become the conditions—the fourth C—or the fourth factor that moderate the relationship between underwriting and the three Cs.

### **3. Surety bond underwriters want and need guidelines to better integrate ESG risks into the underwriting process**

Nearly 70% of respondents indicated that their company’s guidelines were either generic company policies, generic to the process of underwriting, or absent. They also indicated that the majority of evaluation performed on principals’ ESG risk management is conducted via information sources that offer minimal insight into ESG risks—usually through internal documents and desktop review. Furthermore, the survey revealed a gap between the seven risks company policies tended to address and the nine risks individual underwriters said they took into account. Asked explicitly whether universal guidelines were necessary, the response on a 7-point scale was just under 5.

### **4. Surety bond underwriting guidelines are currently more developed on social and governance risk factors than environmental risk factors. Building capacity on integrated ESG risk management is necessary**

Aside from identifying the desire and need for underwriting guidelines, the research provided the insight that social and governance risk factors are currently assessed more routinely and more extensively than environmental risk factors. This also indicates the need for greater knowledge of environmental factors, and the skills needed to assess them properly, in order to achieve an integrated approach to managing ESG risks in underwriting.

These key findings are examined in this report to help conceptualise a new framework for integrating ESG risks into the surety bond underwriting process.

In this vein, this report represents an important step towards a collaborative, insurance industry-wide process to develop global guidance in underwriting ESG risks and strengthen the industry’s contribution to sustainable development.



## Methodology

The project had three phases:

- Analysis of the surety bond market
- Global survey on current practices in integrating ESG risks into surety bond underwriting
- Expert interviews and in-person consultation meetings

### **1. Analysis of the surety bond market**

The analysis of the surety bond market was carried out by an MBA student team from the Enterprise Management Consulting programme at Temple University in Philadelphia, USA. The team scrutinised ESG risks most relevant to dams, thermal fossil fuel power plants, and ports. In addition, the team researched legislation, enforcement, and incentives with respect to ESG risks in Brazil, India, Indonesia, Mexico, Nigeria, South Africa and Turkey.

These countries were identified and selected because of their relatively rapid economic development and the availability of publicly accessible information, providing good opportunities to examine both the surety bond market and large-scale infrastructure projects.

The team sourced information from company and industry reports, audits, energy information administrations, and legislation. It then conducted interviews with senior executives and officials at insurance companies, government agencies, construction companies, and relevant NGOs.

### **2. Global survey on current practices in integrating ESG risks into surety bond underwriting**

A team of MBA students from UTS Business School at the University of Technology Sydney started the second phase of the project, constructing an online survey to gather primary data from surety bond underwriters and experts on current practices in integrating ESG risks into the surety bond underwriting process.

The survey was developed and carried out in collaboration with representatives from Allianz, Generali, IAG, the International Credit Insurance & Surety Association, the International Finance Corporation, Munich Re, the Panamerican Surety Association, and UN Environment's Principles for Sustainable Insurance Initiative.

The survey asked respondents about the following ESG risk factors:





## Environmental risk factors

- Greenhouse gas emissions
- Climate and natural disaster risks
- Inefficient use of resources
- Pollution
- Biodiversity loss and ecosystem degradation



### **Environmental example: Hydropower project declined because of climate change risk**

Large hydropower projects deliver power to factories that use energy-intensive processes to turn raw materials into products. In such cases, surety bonds could cover the construction of a dam, but not the factory or its production of goods.

A few years ago, a hydropower project was proposed in a natural protected area of an island known for its high mountains and glaciers, where glacial water flows directly into the ocean. The planned water reservoir, with a surface area of more than 2,000 square kilometres, was to be situated high in the mountains.

Neither the factory's raw materials nor its consumers were located in the area, which meant that the project would require large ships covering long distances. In addition, the economic feasibility

of the project and, in turn, the profitability of the factory, depended on energy market prices.

The risk for the surety was technically acceptable, and attractive financing was secured. However, after consulting its climate experts, Munich Re declined underwriting the project due to the environmental risks associated with it.

The environmental risks stemmed from the large water reservoir proposed, which would store heat and create considerably higher than average temperatures in the immediate region. Such temperatures were expected to escalate the pace of glacial melting, foster conditions associated with avalanches, and produce micro-climate changes with unforeseeable consequences for the native ecosystem and population.





## Social risk factors

- Human rights violations
- Poor working conditions
- Lack of community health, safety, and security
- Involuntary or forced resettlement
- Lack of consideration of cultural heritage

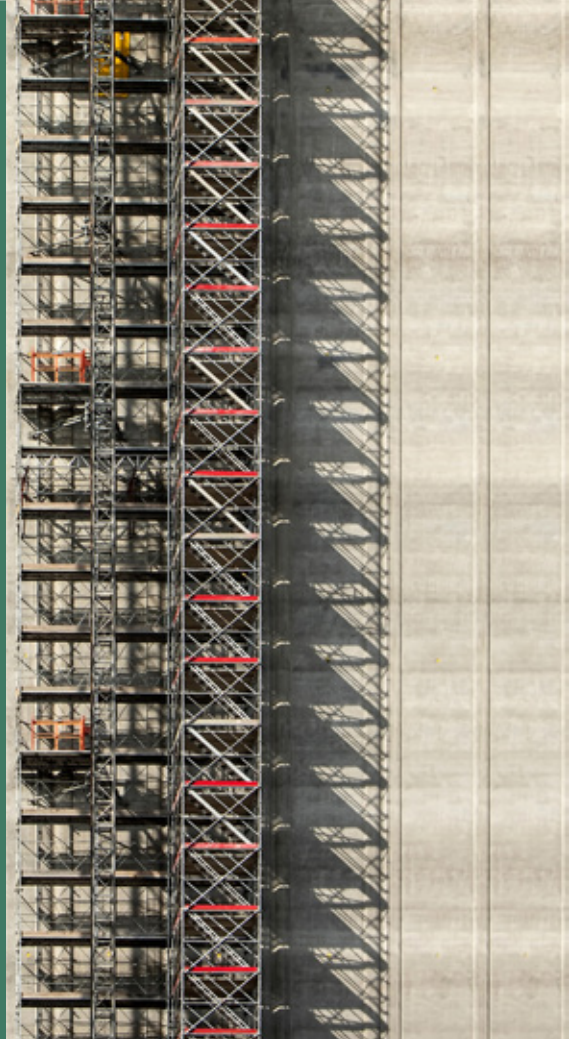
### **Social example: Collaborating on human rights**

In determining whether to provide insurance coverage for the construction of a hydroelectric power plant, Munich Re considered the environmental and safety risks as well as the project's impact on local communities. At the pre-construction stage, no environmental or social issues were identified.

During construction, Munich Re's risk engineers visited the site regularly to monitor conditions. It was during these visits that they noticed issues related to safety and waste management, which had the potential to jeopardise the workers and the project.

Munich Re raised its concerns with the construction company, but the conditions did not improve. Therefore, Munich Re decided to collaborate with the finance providers—the insurance cover was mandatory for the credit lines—to demand improvements from the construction company.

This collaboration between insurance and finance providers increased the pressure on the construction company. Consequently, significant improvements at the site were observed.



## Governance risk factors

- Non-compliance with government mandates and regulations
- Lack of transparency and accountability
- Unethical practices
- Misaligned interests
- Corruption



### Governance example: The high cost of corruption

In a joint venture with other contractors in 2007, a cash-strapped company won a USD 170 million public tender for the construction of a bus rapid transit system. Three years after, it was alleged that the company had engaged in corrupt practices to secure support from key parties, including the head of the project owner and the city's comptroller. Company representatives confirmed that such practices took place in a testimony to the authorities.

Authorities were told that the company dipped into the USD 45.5 million advance payment—which were meant to buy materials and start the bus system—to pay illegal commissions to the head of the project owner and to finance other delayed

construction projects throughout the country. Other current and former public officials were implicated in a wide corruption network. Fraud and bribery charges were filed against senior leaders of the company, which applied for bankruptcy protection, and eventually went bust.

The project owner agreed to transfer the contract to another company to finish the project without calling the performance bond. However, the USD 45.5 million advance payment bond was called and the surety had to fully indemnify. Between losses associated with labour, tax revenues, and infrastructure disruption, the cost of the company's insolvency has been estimated to be around USD 350 million.



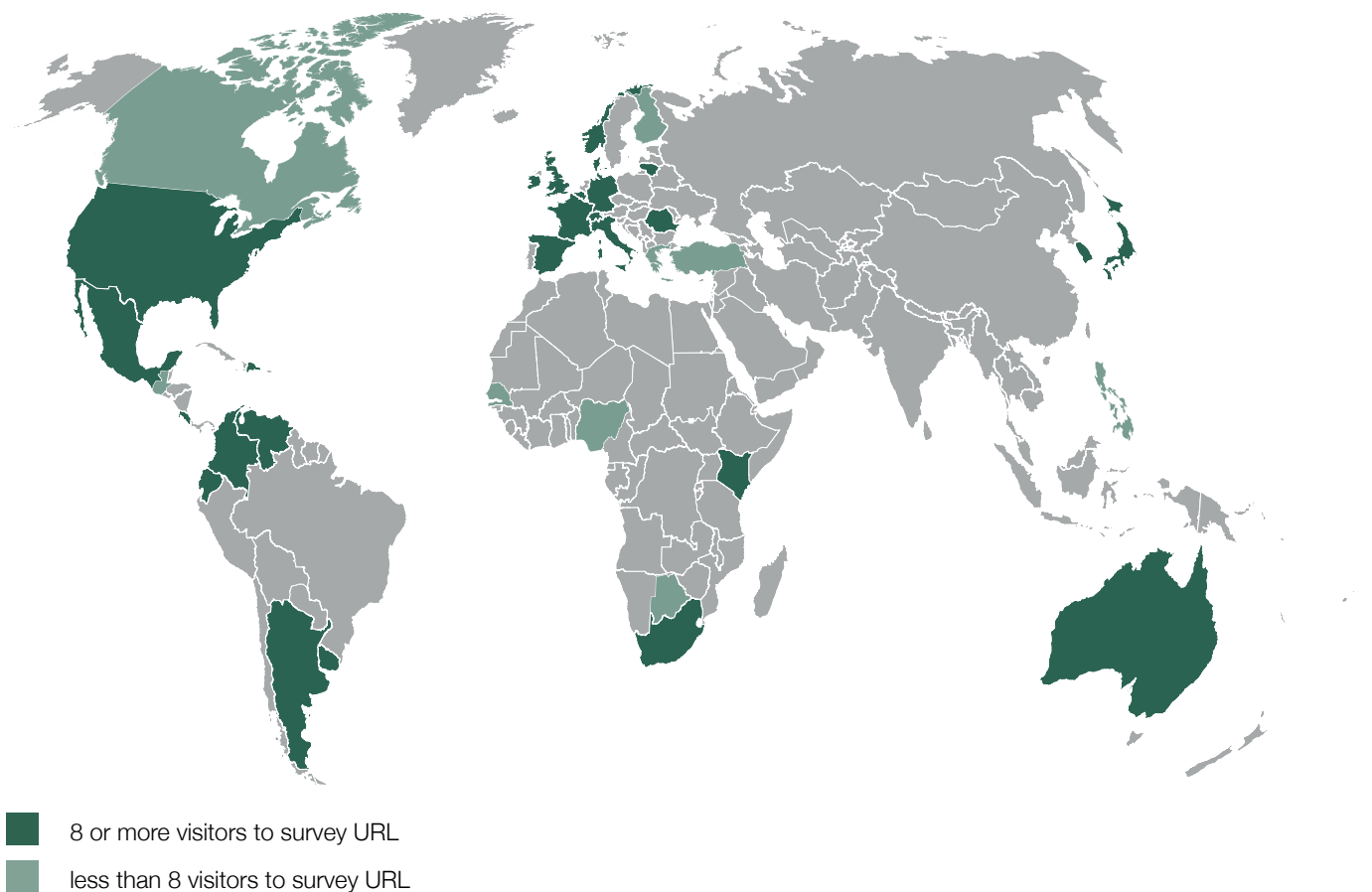
The survey focused on respondents' personal judgments with regard to ESG risks as well as the policies and practices their employers use to address ESG risks. Questions about specific underwriting practices and judgements were limited to those who indicated having underwriting experience.

The survey was distributed electronically over a seven-month period in 2015. Altogether 367 visitors opened the survey and 44 provided complete responses, leading to a 12% response rate.

Of all online survey visitors, 47% originated from Europe, 20% from Latin America and the Caribbean, and 17% from North America (Figure 1). 67% of respondents reported having responsibilities in the surety line of business, and 53% indicated that their job was at the senior management level or higher. More than 44% of respondents reported having surety underwriting experience, and 68% reported that their education background included a graduate degree.

Tests were carried out to see whether responses could be linked to particular traits or affiliations of the participants. Respondents' banking experience, industry experience, company size, geographic location, geographic responsibility, line-of-business responsibility, education, and certifications were assessed. Except where discussed below, no statistically significant differences emerged.

**Figure 1: Source of online survey visitors**



### 3. Expert interviews and in-person consultation meetings

To complement the first two phases, project team members interviewed surety bond underwriting experts from leading insurance and reinsurance companies.

Furthermore, the project team consulted the international underwriting community and key stakeholders on current underwriting and ESG risk management practices through major events such as the General Assembly of the Panamerican Surety Association in Cancún, Mexico in May 2016, the Autumn Meetings of the International Credit Insurance & Surety Association in Amsterdam, the Netherlands in September 2016, and the international market event convened by UN Environment's Principles for Sustainable Insurance Initiative and Allianz in Munich, Germany in October 2016.

## Analysis of findings

### 1. ESG risk factors influence surety bond underwriting decisions

Among other questions, the survey sought respondents' level of agreement with the following statements:

- ESG risks can be quantified.
- ESG risk assessments on surety bond underwriting results can be quantified.
- ESG risk assessments should influence surety bond underwriting processes.
- ESG risk assessments should influence surety bond pricing.

#### 1.1. ESG risks can be quantified and should influence surety bond pricing

The average respondent agreed that ESG risks can be quantified, and that they should influence underwriting and bond pricing. These responses point to *how* ESG risks influence the underwriting process. The perception that quantifiable ESG risks should influence underwriting and pricing suggests that ESG risks are material and are a contributing factor to contractor failure.

**Table 1: The influence of ESG risks on surety bond underwriting**

Statement	Stongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
ESG risks can be quantified.	0%	0%	13%	20%	30%	<b>33%</b>	3%
ESG risk assessments on surety bond underwriting results can be quantified.	0%	3%	10%	23%	20%	<b>40%</b>	3%
ESG risk assessments should influence surety bond underwriting processes.	0%	0%	0%	10%	30%	<b>40%</b>	20%
ESG risks assessments should influence surety bond pricing.	0%	3%	3%	13%	<b>33%</b>	27%	20%



An interesting insight arose from the response to the statement, “ESG risks assessments should influence surety bond pricing”. Agreement with the statement was greater for those *without* responsibility for the surety line of business and for those *without* underwriting experience (see Table 2).

While all respondents generally agreed with the statement, those respondents outside of surety business or without underwriting expertise were more confident in their response.

**Table 2: Should ESG risk assessments influence pricing?**

	All $\mu$	With $\mu$	Without $\mu$	t	Pr( T  >  t )
All respondents	4.97				
Underwriting experience		3.93	4.67	2.49	0.019
Surety responsibility		4.53	5.73	2.56	0.016

1 = Strongly Disagree, 7 = Strongly Agree

For those without surety responsibilities, perhaps their line-of-business responsibilities have a well-known association with ESG risks (for example, between property and climate change) and their heightened agreement could represent their expectation that their knowledge is applicable to other lines of business.

For those without underwriting experience, the difference could be accounted for by reviewing their agreement with the statement “ESG risks can be quantified”. Those *with* underwriting experience slightly disagreed with this statement, while those without underwriting experience were neutral. The statistically significant difference suggests that underwriters believe ESG risks should not affect pricing (hypothesis: they usually reject the risk due to “zero-loss underwriting”), and that ESG risks cannot be quantified.

The responding underwriters seemed to suggest that accounting for ESG risks through ambiguous quantifications is basically guesswork. This may be the by-product of the fact that there is no existing, industry-endorsed framework for integrating ESG risks into surety bond underwriting. Underwriting “character” is certainly no less ambiguous, yet the long-standing practice is to factor this heavily into the underwriting of all surety products. Later in this section, the challenges in quantifying ESG risks will be discussed.

### 1.2. Specific ESG risks influence judgements

The finding that ESG risk factors affect surety bond underwriting is also supported by survey responses to specific ESG issues. Underwriters were asked to indicate their level of agreement to the statement, “I consider [this ESG risk] when underwriting surety bonds for infrastructure projects”. Majority agreed that 12 of the 15 ESG risks surveyed influence their judgements during the underwriting process (see Table 3). The top four risks had at least 80% of respondents “Strongly Agree” or “Agree” with the statement.





**Table 3: ESG risk factors considered by underwriters**

Statement	Stongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
Transparency	0%	0%	0%	7%	7%	40%	<b>47%</b>
Corruption	0%	0%	0%	7%	7%	<b>47%</b>	40%
Compliance	0%	0%	0%	13%	0%	<b>53%</b>	33%
Ethics	0%	0%	0%	7%	13%	<b>47%</b>	33%
Working conditions	0%	0%	0%	7%	29%	<b>36%</b>	29%
Misaligned interests	0%	0%	0%	20%	20%	<b>33%</b>	27%
Human rights	0%	0%	7%	21%	7%	29%	<b>36%</b>
Forced resettlements	0%	0%	0%	14%	29%	<b>36%</b>	21%
Community health	0%	0%	0%	14%	<b>43%</b>	14%	29%
Climate	0%	0%	7%	29%	<b>36%</b>	14%	14%
Pollution	0%	0%	0%	<b>46%</b>	23%	15%	15%
Biodiversity	0%	0%	0%	<b>43%</b>	21%	29%	7%
Resource use	0%	0%	0%	<b>50%</b>	21%	21%	7%
Cultural insensitivity	0%	0%	14%	<b>36%</b>	14%	29%	7%
Greenhouse gases	0%	14%	14%	<b>29%</b>	21%	14%	7%

On specific ESG risks, corruption and transparency were evaluated by respondents as the risk factors having the greatest frequency and severity. Cultural insensitivity and forced resettlements were evaluated as being the most unquantifiable and uncontrollable risk factors.

## 2. ESG risks represent a “fourth C” in surety bond underwriting

Existing research on surety bonds emphasises the capital, capacity, and character of the principal—“the three C’s”—as a means of predicting contract failure. On balance, measuring capital is easier than measuring capacity, and measuring capacity is easier than measuring character.

By analysing survey results, a case can be made that the underwriting of ESG risks should also consider a “fourth C”—the *conditions* surrounding contractors and principals.

### 2.1. Capacity and character are not isolated

The argument that capacity and character are not isolated starts with survey responses that suggest assessing principals’ capacity and character requires estimating ESG risks present in the environment.

Respondents were asked to rank the impact of ESG risk assessments on principals’ capital, capacity, and character (along a 7-point Likert scale where 1 = no impact and 7 = strong impact). The average scores were not statistically different from each other (see Table 4).





Thereafter, respondents were asked to explain the relationship between the three Cs and ESG risks. Their explanations made explicit connections between ESG risks and the character and capacity of project owners and contractors. One underwriter said:

**“Project owners and contractors are at the very source of all ESG risks. Their serious intention to identify and manage all relevant ESG aspects is key to any efficient transfer of risks to financial markets through insurance tools.”**

This explanation, and other similar responses, can be interpreted as evidence that project owners’ and contractors’ character can be manifested in terms of their willingness to manage ESG risks.

As for capital, one respondent asserted:

**“Capitalized [owners/contractors] have more assets to focus on ESG risks; the capacity to identify and deal with ESG risks influences how strongly they focus on assessing them; and their character will define their willingness to deal with ESG risks.”**

In this quote, once again, there is an expectation that character represents project owners’ and contractors’ willingness to manage ESG risks. However, this respondent added capacity as a condition on character—that is, the willingness to manage ESG risks is limited by the resources available to do so.

**Table 4: What impact do ESG risk assessments have on principals’ three C’s?**

	$\mu$	$\sigma$
Capital	4.57	1.57
Capacity	4.67	1.18
Character	4.77	1.38

1 = No Impact, 7 = Strong Impact

**2.2. Contractors and principals are responsible for assessing risks**

A separate survey item has shown that it is project owners, along with contractors/principals, who are considered to be in the best position to assess ESG risks. The survey asked respondents to rate their agreement with the statement that an insurance entity bears responsibility for assessing and managing ESG risks. The answers to this question provide further insight into who is responsible for evaluating the “fourth C”.

Project owners and contractors received the highest average rating, which was above the burden attributed to credit rating agencies and insurance intermediaries (see Table 5).



Again, response differences were identified between those with responsibility for the surety line of business and those without. Those *with* responsibility indicated weaker agreement with the idea that contractors, credit rating agencies, and insurance intermediaries bear a responsibility for assessing and managing risk. The difference does not change the order of the entities, but it is another demonstration of how the surety business is distinct from other lines of business in the insurance industry.

The fact that all respondents place responsibility for assessing and managing ESG risks on project owners and contractors is consistent with the insurance industry’s preference to align interests. That is, those paying (contractors/principals) and benefiting (project owners) from surety bonds have motivation to account for risk factors that alter the ability of a surety product to add value. This reality is confirmed by one respondent who said:

.....  
**“ESG risks are the foundation of financial AND moral hazard underwriting.”**  
 .....

**Table 5: Who should assess and manage ESG risks?**

	All μ	With surety responsibility μ	Without surety responsibility μ	t	Pr( T  >  t )
Project owners	6.03				
Project contractors/principals	6.03	5.70	6.64	2.35	0.03
Insurers and reinsurers	5.65				
Insurance regulators	5.06				
Credit rating agencies	4.81	4.40	5.55	2.06	0.05
Insurance and reinsurance intermediaries	4.52	4.05	5.36	2.40	0.02

1 = Strongly Disagree, 7 = Strongly Agree

The argument so far is that accounting for ESG risks is necessary to assess contractors’/ principals’ capital, capacity, and character, and that contractors/principals are in the best position to produce accurate assessments. The combination of these findings suggests that contractors/principals are, to a degree, self-reporting their capital, capacity, and character to surety bond underwriters. This “moral hazard” is exacerbated by the relatively abstract nature of capacity and character measures.



### 2.3. Conceptualising an underwriting framework for the four C's

Given the survey results, a framework between underwriting and the four Cs can be conceptualised.

Relative to capital, the margin of error in assessing a contractor's/principal's capacity and character is greater. Measuring **capital** is done through well-established accounting standards and its ease is fostered through financial statements widely available to the public. The relatively accurate measurement of capital is due in part to its emphasis on current financial positions.

**Capacity**, in contrast, represents the ability of a contractor/principal to accept additional responsibilities. These judgments are based on assumptions about future income, debts, works-in-progress, and asset appreciation or depreciation. Hence, measuring capacity involves degrees of forecasting uncertainty that measurements of capital do not necessarily experience.

**Character**, a depiction of a contractor's/principal's reliability and integrity, is just as abstract a measure as capacity, if not more so. Character relies on a contractor's/principals' historical performance. The connection between prior and future performance—specifically referring to the project to be assessed—has to prove that the contexts and dynamics of the past will remain the same into the future.

Thus, for the purposes of underwriting surety bonds, it can be asserted that measuring contractors'/principals' capital is easier and more precise than measuring their capacity or character, and assessments of contractors'/principals' capacity and character are obscured by the moral hazard that comes from their self-reporting of ESG risk assessment and management.

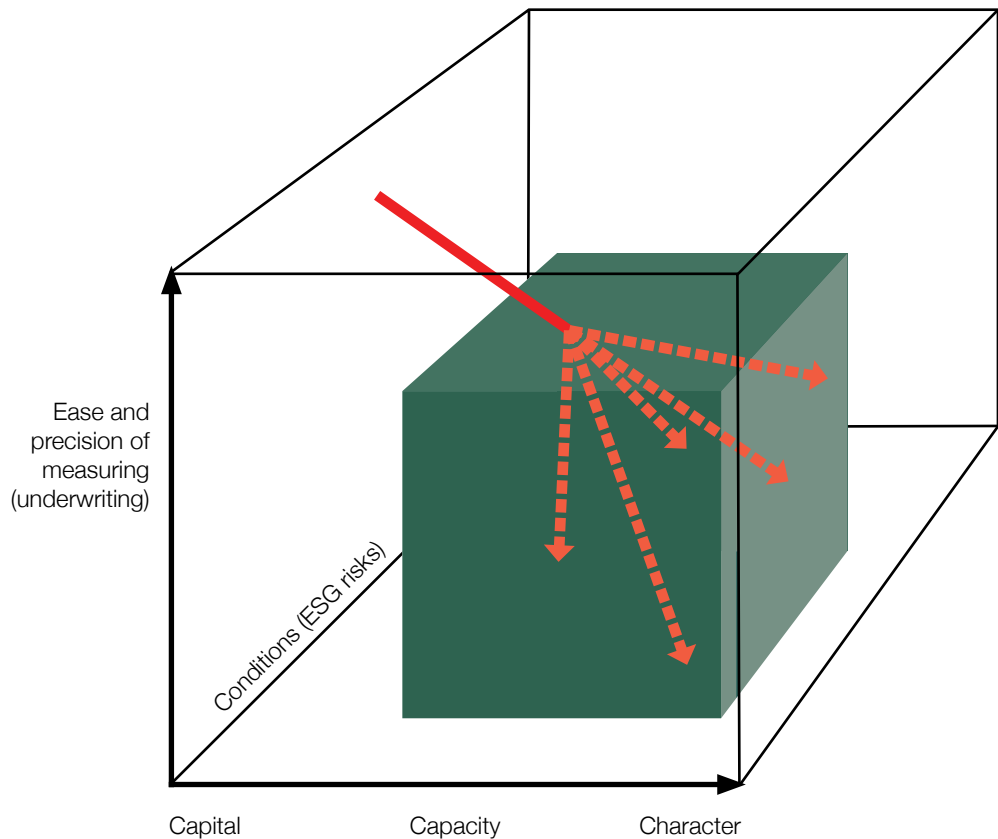
Hence, the heart of the survey findings is that understanding ESG risks is material to assessments of capacity and character, and therefore critical to surety bond underwriting. The ESG risks at play in any infrastructure project become the conditions that moderate the relationship between underwriting and the three Cs. That is, ESG risks represent intervening variables that may strengthen or weaken the effect of contractors'/principals' capacity and character on underwriting.

These effects can be graphically modelled through the use of a Z-axis (see Figure 2). Survey respondents suggested ESG risk conditions can increase or decrease the ease and precision of measuring capacity and character. The grey cube and dashed lines, represent the distorting and uncertain effect ESG risks have on the assessment process.

Therefore, the challenge for surety underwriters is to identify the ESG risks that distort assessments of principals' capacity and character, and to create risk management guidelines and protocols to counter this distortion.



**Figure 2: ESG factors deepen understanding of principals' capacity and character**



**3. Surety bond underwriters want and need guidelines to better integrate ESG risks into the underwriting process**

Having established that ESG risks are material to surety underwriting and to assessments of principals' capacity and character, the survey reveals a desire for universal guidelines for integrating ESG risk assessments into the underwriting of surety bonds. This finding is substantiated by responses to four survey items.

**3.1. Explicit desire for guidelines**

First, and most simply, respondents explicitly stated a desire for guidelines. On the 7-point Likert scale, responses to the statement, "Universal guidelines on incorporating ESG risk assessments into the underwriting of surety bonds for infrastructure projects are necessary" averaged 4.93 (with a median and mode of 6).

Additional responses suggested guidelines should engage surety bond underwriters into the process earlier in a project. For the statement, "Earlier participation of surety bond underwriters in the project life cycle would improve awareness of ESG risks", responses averaged 4.97.

These responses have led to the conclusion that underwriters want guidance and want to be involved earlier in projects, in part to engage principals and obligees about assessing and managing ESG risks. This confirms experience from other segments of the financial sector. For example, banks and private equity funds have been using ESG risk assessment



frameworks such as the Equator Principles or IFC Performance Standards for some years now.

As others have noted (Poindexter, 2016), engaging contractors on “red flags” improves the probability of securing a bond that is valued by the project owner. ESG risks represent an emerging type of red flag where guidelines would benefit entities underwriting surety bonds, as well as the principals in need of bonding.

### 3.2. Guidelines largely generic or absent

Second, the survey also asked participants about current guidelines for assessing and managing ESG risks. In this regard, 67% of respondents indicated their company’s guidelines were either generic company policies, generic to the process of underwriting, or absent (see Table 6).

As discussed earlier in this report, those *with* surety experience perceive price effects, and ESG risk assessment and management, differently from those *without* surety experience. This raises the question whether generic company and underwriting guidelines are adequate to meet the specific needs of surety bonds, which is quite different from other lines of business in the insurance industry. Therefore, it can be asserted that 67% of companies do not possess effective guidelines for assessing and managing ESG risks—risks that, per the survey, are material to the performance of surety bonds.

**Table 6: How does your company provide guidance for assessing and managing ESG risks?**

Specific line-of-business guidelines	33%
Generic company policies	31%
Generic underwriting guidelines	25%
No guidelines	12%

### 3.3. Evaluation is mostly distant

Third, respondents also indicated that most of the evaluation performed on principals’ ESG risk management is done through information sources that offer minimal insight into ESG risks, which are inherently ambiguous and highly nuanced. Table 7 summarises responses to the survey item, “Indicate the frequency with which your company uses the listed methods to confirm principals’ management of the ESG risks” (7-point Likert scale where 1 = never and 7 = always).

Across ESG risks, internal documents and desktop review were the most common methods of evaluation. In addition, survey respondents indicated slight disagreement with the statement, “Surety bond applications provide adequate data for assessing projects’ ESG risks”.

Principals are understood to be responsible for assessing and managing ESG risks (Table 5), and ESG conditions are said to affect the ease and precision of measuring principals’ capacity and character (Figure 2). In this context, the distant review of documents appears inadequate in assessing projects’ ESG risks and could undermine the validity and reliability of the underwriting process.



**Table 7: Most popular methods for confirming principals' management of ESG risks**

	Environmental		Social		Governance		All ESG risks weighted $\mu$
	$\mu$	$\sigma$	$\mu$	$\sigma$	$\mu$	$\sigma$	
Internal documents	4.22	1.95	4.14	1.91	4.78	1.83	4.38
Desktop review	3.95	2.44	3.95	2.19	4.55	2.15	4.15
Phone interviews	3.10	1.76	2.90	1.76	3.00	1.82	3.00
Announced field visits	3.10	1.67	2.90	1.64	2.90	1.64	2.97
Face-to-face interviews	2.86	1.56	3.00	1.61	3.05	1.63	2.97
Unannounced field visits	2.25	1.77	2.25	1.77	2.25	1.77	2.25

### 3.4. Individuals integrate a wider range of risk factors

Fourth, underwriters are actively integrating into their assessments ESG risks that are not accounted for by company policies. Underwriters were asked to what extent they agreed that specific ESG risks were integrated into their company underwriting policies and guidelines for surety bonds. They were also asked the extent to which they, as individuals, consider these ESG risks in their underwriting decisions. In other words, what ESG risks are they accounting for using the “underwriting manual in the head”, which in practice is influenced by experience?

The responses are summarised in Table 8. Under company policy, a group of seven ESG risks—corruption, compliance, transparency, ethics, misaligned interests, human rights, and working conditions—emerge as the most commonly integrated risk factors into surety bond underwriting. However, as individuals, the underwriters identified nine ESG risks that they take into account. The additional two risks identified were community health and forced resettlements.

This difference is further evidence that additional guidelines are necessary to account for all ESG risk factors that affect underwriting.





**Table 8: Comparing the “company underwriting manual” against the “underwriting manual in the head”**

ESG risk factor	“For underwriting, my company integrates this ESG risk”		“For underwriting, I integrate this ESG risk”	
	$\mu$	$\Sigma$	$\mu$	$\Sigma$
Corruption	6.04*	1.07	6.20**	0.86
Compliance	5.96*	1.10	6.07**	0.96
Transparency	5.93*	1.09	6.27**	0.88
Ethics	5.71*	1.41	6.07**	0.88
Misaligned Interests	5.59*	1.19	5.67**	1.11
Human Rights	5.37*	1.52	5.64**	1.39
Working Conditions	5.37*	1.11	5.86**	0.95
<i>Community Health</i>	5.11	1.40	5.57**	1.09
<i>Forced Resettlements</i>	5.07	1.44	5.64**	1.01
Climate	4.93	1.41	5.00	1.18
Resource Use	4.85	1.05	4.86	1.03
Pollution	4.78	1.31	5.00	1.15
Biodiversity	4.78	1.15	5.00	1.04
Greenhouse	4.52	1.22	4.29	1.49
Cultural Insensitivity	4.52	1.28	4.79	1.25
* These averages are not statistically different from each other ( $p \leq 0.05$ )				
** These averages are not statistically different from each other ( $p \leq 0.05$ )				

**4. Surety bond underwriting guidelines are currently more developed on social and governance risk factors than environmental risk factors. Building capacity on integrated ESG risk management is necessary**

Aside from identifying the desire and need for underwriting guidelines, the research provided the insight that social and governance risk factors are currently assessed more routinely and more extensively than environmental risk factors. This also indicates the need for greater knowledge of environmental factors, and the skills needed to assess them properly, in order to achieve an integrated approach to managing ESG risks in underwriting.



Using survey responses on the impact each ESG risk has on surety bond underwriting, a factor analysis was performed. Table 9 shows “latent factors” that emerge from this analysis—the unobserved causes that underlie or connect some or all of the ESG risks.

**Table 9: Rotated factor analysis for the impact ESG risks have on underwriting**

ESG risk	Factor 1	Factor 2	Factor 3	Factor 4
	Social and gov- ernance factor	Stakeholder interest factor	Environmental impact factor	Greenhouse gas emission factor
Greenhouse gas emissions	0.086	0.069	0.231	<b>0.948</b>
Climate change	0.287	0.103	0.380	0.233
Inefficient resource utilization	0.105	0.030	0.187	0.040
Pollution	0.123	0.264	<b>0.865</b>	0.251
Biodiversity	0.265	0.120	<b>0.672</b>	0.168
Human rights	<b>0.681</b>	0.160	0.172	-0.012
Working conditions	0.559	<b>0.665</b>	0.294	0.220
Community health	0.399	<b>0.783</b>	0.264	0.311
Forced resettlements	0.354	<b>0.782</b>	0.092	-0.219
Cultural insensitivity	0.137	0.248	0.293	0.158
Compliance with government mandates	<b>0.953</b>	0.178	0.063	0.026
Transparency	<b>0.786</b>	0.380	0.292	0.079
Ethics	<b>0.892</b>	0.244	0.020	0.054
Misaligned interests	<b>0.652</b>	0.365	-0.020	0.334
Corruption	<b>0.789</b>	0.289	0.329	0.123
Eigenvalue	8.593	2.037	1.117	1.023

Four factors with Eigenvalues greater than 1.0 emerged. In addition, loadings greater than 0.60 have been highlighted, showing the ESG risks that share the same latent factor. For example, latent “Factor 1” (social and governance factor) is shared by human rights, compliance, transparency, ethics, misaligned interests, and corruption. “Factor 2” (stakeholder interest factor) is shared by working conditions, community health, and forced resettlements. “Factor 3” (environmental impact factor) is shared by pollution and biodiversity. “Factor 4” is greenhouse gas emissions.

#### **Factor 1: Social and governance factor**

The first and most significant risk factor (with an Eigenvalue of 8.593) are social and governance risks associated specifically with the principal. This factor suggests underwriting assessments should blend several levels of analysis into one that interprets the greater ESG risk conditions in which principals operate.

Predicting principals’ failure from financial performance, liquidity, or managerial competence—metrics associated with capital, capacity, and character—ignores, for instance, the macro-level dynamics over which principals, as leaders of large-scale infrastructure projects, have influence, such as transparency and ethics.



Furthermore, expectations or standards of transparency, ethics, and human rights differ across markets and jurisdictions. The financial measures relied upon by underwriters are too simplistic for measuring principals' ESG risk management competencies across diverse markets.

**Factor 2: Stakeholder interest factor**

The second factor embodies stakeholders' interests in large-scale infrastructure projects. Stakeholders are those who affect or are affected by the activities of the principals, such as workers and local communities (Freeman, 1984). Those most likely to make claims against the principal, despite *successful* completion of a contract, are represented in this factor. For example, employees who have been subject to exploitive practices, or indigenous people whose quality of life has been infringed. This factor is a good representation of the tacit or implicit nature of surety bonds—that is, ESG risks extend surety bonds beyond their contractual obligations to the project owner.

**Factor 3: Environmental impact factor**

The third factor represents the proximate environmental impact that accompanies large infrastructure projects. The latent factor here emerges from pollution and biodiversity and is consistent with the Kuznets Curve (Grossman & Krueger, 1995; Kuznets, 1955; Shafik, 1994; World Bank, 1992), where pollution and other environmental harm increases as a developing country becomes industrialised.

**Factor 4: Greenhouse gas emission factor**

The fourth and final factor is based on greenhouse gas emissions. This factor is also consistent with the Kuznets Curve but the proximity of the environmental damage differs. While the third factor represents environmental harm that can be easily attributable to a large-scale infrastructure project being underwritten, this fourth factor represents the more challenging attribution for environmental harm due to greenhouse gas emissions. While the construction of, say, highways and bridges could contribute to greenhouse gas emissions, it is difficult to quantify how much is attributable to a specific project. At the same time, underwriters seem to acknowledge that despite the difficulty in attribution, some liability is still borne by the principal.



# Conclusion

This exploratory study on ESG risk factors and their impact on surety bond underwriting has provided illumination on *how* ESG risks influence the underwriting process, *who* bears responsibility for identifying and mitigating the negative impacts of ESG risks, and *which* ESG risks are currently more routinely and more extensively assessed.

The survey shows that ESG risks influence surety bond underwriting as part of the aim of preventing losses (zero-loss underwriting). It also reveals strong interest in universal ESG underwriting guidelines that companies around the world could integrate into their existing practices. Given the unique structure and loss triggers in surety bonds (a three-party contract), and the survey results, current underwriting guidelines are more developed on social and governance risk factors than environmental risk factors. Therefore, building capacity on integrated ESG risk management is necessary.

The conclusion is that a new framework for integrating ESG risks into the surety bond underwriting process should embed a “fourth C” to existing risk factors on the capital, capacity and character of principals. This fourth factor are the ESG risk conditions in which infrastructure projects are undertaken.

This fourth factor in surety bond underwriting is a concrete example of how to turn Principle 1 of the Principle for Sustainable Insurance into practice:

“We will embed in our decision-making environmental, social and governance issues relevant to our insurance business.”

In this vein, this report represents an important step towards a collaborative, insurance industry-wide process to develop global guidance in underwriting ESG risks and strengthen the industry’s contribution to sustainable development.



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# References

- Al-Sobie, O. S., Arditi, D., & Polat, G. (2005). Predicting the risk of contractor default in Saudi Arabia utilizing artificial neural network (ANN) and genetic algorithm (GA) techniques. *Construction Management & Economics*, 23(4), 423-430. doi:10.1080/01446190500041578
- Awad, A., & Fayek, A. R. (2012). Contractor default prediction model for surety bonding. *Canadian Journal of Civil Engineering*, 39(9), 1027-1042. doi:10.1139/l2012-028
- Bayraktar, M. E., & Hastak, M. (2010). Scoring Approach to Construction Bond Underwriting. *Journal of Construction Engineering and Management*, 136(9), 957-967. doi:10.1061/(ASCE)CO.1943-7862.0000217
- El-Mashaleh, M. S., & Horta, I. M. (2016). *Evaluating Contractors for Bonding: DEA Decision Making Model for Surety Underwriters*. *Journal of Management in Engineering*, 32(1), 1-7. doi:10.1061/(asce)me.1943-5479.0000382
- Fadhil Abidali, A., & Harris, F. (1995). A methodology for predicting company failure in the construction industry. *Construction Management & Economics*, 13(3), 189-196.
- Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Boston, MA: Pitman Publishing.
- Grossman, G. M., & Krueger, A. B. (1995). Economic Growth and the Environment. *The Quarterly Journal of Economics*, 110(2), 353-377. doi:10.2307/2118443
- Kangari, R., & Bakheet, M. (2001). Construction Surety Bonding. *Journal of Construction Engineering & Management*, 127(3), 232.
- Kuznets, S. (1955). Economic Growth and Income Inequality. *The American Economic Review*, 45(1), 1-28.
- Marsh, K., & Fayek, A. R. (2010). SuretyAssist: Fuzzy Expert System to Assist Surety Underwriters in Evaluating Construction Contractors for Bonding. *Journal of Construction Engineering and Management*, 136(11), 1219-1226. doi:10.1061/(ASCE)CO.1943-7862.0000224
- Poindexter, C. C. (2016). Red Flags for Contract Surety Underwriters. *ENR: Engineering News-Record*, 7.
- Russell, J. S., & Zhai, H. (1996). Predicting contractor failure using stochastic dynamics of economic and financial variables. *Journal of Construction Engineering & Management*, 122(2), 183.
- Severson, G. D., Russell, J. S., & Jaselskis, E. J. (1994). Predicting Contract Surety Bond Claims Using Contractor Financial Data. *Journal of Construction Engineering and Management*, 120(2), 405-420. doi:10.1061/(ASCE)0733-9364(1994)120:2(405)
- Shafik, N. (1994). Economic Development and Environmental Quality: An Econometric Analysis. *Oxford Economic Papers*, 46 (Special Issue on Environmental Economics), 757-773.
- Tserng, H. P., Liao, H.-H., Tsai, L. K., & Chen, P.-C. (2011). Predicting Construction Contractor Default with Option-Based Credit Models-Models' Performance and Comparison with Financial Ratio Models. *Journal of Construction Engineering & Management*, 137(6), 412-420. doi:10.1061/(ASCE)CO.1943-7862.0000311
- World Bank. (1992). World Development Report 1992: Development and the Environment. Retrieved from <https://openknowledge.worldbank.org/handle/10986/5975> License: CC BY 3.0 IGO.



# Appendices

## The Principles for Sustainable Insurance

### PRINCIPLE 1

We will embed in our decision-making environmental, social and governance issues relevant to our insurance business

#### **Company strategy**

- Establish a company strategy at the Board and executive management levels to identify, assess, manage and monitor ESG issues in business operations
- Dialogue with company owners on the relevance of ESG issues to company strategy
- Integrate ESG issues into recruitment, training and employee engagement programmes

#### **Risk management and underwriting**

- Establish processes to identify and assess ESG issues inherent in the portfolio and be aware of potential ESG-related consequences of the company's transactions
- Integrate ESG issues into risk management, underwriting and capital adequacy decision-making processes, including research, models, analytics, tools and metrics

#### **Product and service development**

- Develop products and services which reduce risk, have a positive impact on ESG issues and encourage better risk management
- Develop or support literacy programmes on risk, insurance and ESG issues

#### **Claims management**

- Respond to clients quickly, fairly, sensitively and transparently at all times and make sure claims processes are clearly explained and understood
- Integrate ESG issues into repairs, replacements and other claims services

#### **Sales and marketing**

- Educate sales and marketing staff on ESG issues relevant to products and services and integrate key messages responsibly into strategies and campaigns
- Make sure product and service coverage, benefits and costs are relevant and clearly explained and understood

#### **Investment management**

- Integrate ESG issues into investment decision-making and ownership practices (e.g. by implementing the Principles for Responsible Investment)



## PRINCIPLE 2

We will work together with our clients and business partners to raise awareness of environmental, social and governance issues, manage risk and develop solutions

### **Clients and suppliers**

- Dialogue with clients and suppliers on the benefits of managing ESG issues and the company's expectations and requirements on ESG issues
- Provide clients and suppliers with information and tools that may help them manage ESG issues
- Integrate ESG issues into tender and selection processes for suppliers
- Encourage clients and suppliers to disclose ESG issues and to use relevant disclosure or reporting frameworks
- Insurers, reinsurers and intermediaries
- Promote the adoption of the Principles
- Support the inclusion of ESG issues in professional education and ethical standards in the insurance industry

## PRINCIPLE 3

We will work together with governments, regulators and other key stakeholders to promote widespread action across society on environmental, social and governance issues

### **Governments, regulators and other policymakers**

- Support prudential policy, regulatory and legal frameworks that enable risk reduction, innovation and better management of ESG issues
- Dialogue with governments and regulators to develop integrated risk management approaches and risk transfer solutions

### **Other key stakeholders**

- Dialogue with intergovernmental and non-governmental organisations to support sustainable development by providing risk management and risk transfer expertise
- Dialogue with business and industry associations to better understand and manage ESG issues across industries and geographies
- Dialogue with academia and the scientific community to foster research and educational programmes on ESG issues in the context of the insurance business
- Dialogue with media to promote public awareness of ESG issues and good risk management

## PRINCIPLE 4

We will demonstrate accountability and transparency in regularly disclosing publicly our progress in implementing the Principles

- Assess, measure and monitor the company's progress in managing ESG issues and proactively and regularly disclose this information publicly
- Participate in relevant disclosure or reporting frameworks
- Dialogue with clients, regulators, rating agencies and other stakeholders to gain mutual understanding on the value of disclosure through the Principles



# Survey questions

## Company/Employer information

1. Which type of entity are you responding on behalf of? (Insurer, Reinsurer, Insurance intermediary, Reinsurance intermediary)
2. Is your company a member of the Panamerican Surety Association (PASA)?
3. Is your company a subsidiary or a parent company?
4. In US dollars, what is your company's estimated 2014 gross premium written over all lines of insurance?
5. In US dollars, what is your company's estimated 2014 gross revenue?
6. In US dollars, indicate the estimated value of the surety bond premiums that were underwritten or placed by your company in 2014.

## Respondent information

7. What is your functional area of responsibility? (Board Member / CEO / President, Underwriting, Actuarial, Enterprise Risk Management, Product Development, Sales / Marketing, Claims Management, Asset Management / Investment, Strategy, Sustainability / Corporate Responsibility, Governmental / Regulatory / Legal / Corporate Governance Affairs, Knowledge Management, Communications or Public Relations, Human Resources Administration, Accounting)
8. What is your job level or rank? (Consultant / Associate / Analyst, Junior Manager, Middle Manager, Senior Manager, Executive Management, Member of the Board of Directors)
9. For what lines of business are you responsible? (Trade and Export Credit / Political Risk, Surety, Agroforestry, Liability, Engineering, Workers Compensation, Marine Aviation and Transport, Motor, Property, Health, Life)
10. Please indicate the territories where (1) your company does business and (2) you have underwriting responsibilities.
11. How many years of insurance industry experience do you have?
12. How many years of insurance industry experience do you have in surety bond underwriting?
13. How many years of insurance industry experience do you have in underwriting (excluding surety)?
14. How many years of insurance industry experience do you have in any other, non-underwriting capacity?
15. Do you have working experience in the banking industry?
16. How many years of banking industry, working experience do you have in:
  - a. Risk Management?
  - b. Internal Control and Compliance?
  - c. Strategic Business Development and General Management?
  - d. Quality Management?
  - e. Enterprise Banking Service Delivery?
  - f. Enterprise Banking Operations and Support?
  - g. Enterprise Banking Product Development and Brand Marketing?
  - h. Enterprise Banking Credit Management?
  - i. Enterprise Sales & Relationship Management?



- j. Technology Management?
- k. Any other capacity?
- 17. What is the highest level of education that you have achieved?
- 18. What underwriting certifications do you possess? (CLU - Chartered Life Underwriter, RHU - Registered Health Underwriter, API - Associate in Personal Insurance, ACU - Associate in Commercial Underwriting, CPCU - Chartered Property and Casualty Insurance Underwriter)
- 19. Indicate how familiar and experienced you are with the following ESG frameworks (5 point scale from “no familiarity or experience” to “extensive familiarity or experience”):
  - a. IFC Environmental and Social Performance Standards
  - b. ISO 14001 Environmental Management
  - c. ISO 26000 Social Responsibility
  - d. Principles for Responsible Investment
  - e. Principles for Sustainable Insurance
  - f. UN Global Compact Principles

### Personal judgments regarding ESG risk assessment in surety bond underwriting

- 20. In the context of surety bond underwriting for infrastructure projects, please assess each risk factor according to its frequency, severity, controllability, and quantifiability (4 point scale from “not” to “very”):
  - a. Greenhouse gas emissions
  - b. Climate and natural disaster risks
  - c. Inefficient use of resources
  - d. Pollution
  - e. Biodiversity loss and ecosystem degradation
  - f. Human rights violations
  - g. Poor working conditions
  - h. Lack of community health, safety and security
  - i. Involuntary or forced resettlement
  - j. Lack of consideration of cultural heritage
  - k. Non-compliance with government mandates and regulations
  - l. Lack of transparency and accountability
  - m. Unethical practices
  - n. Misaligned interests
- 21. Please indicate your agreement with the following statement: “The project \_\_\_\_\_ strengthens the influence ESG risk assessments have on surety bond underwriting for infrastructure projects.” (7 point scale from “Strongly Disagree” to “Strongly Agree”)
  - a. Size
  - b. Type
  - c. Location
  - d. Owner
  - e. Contractor / Principal
- 22. Indicate your agreement with this statement: “As an underwriter, I consider \_\_\_\_\_ when underwriting surety bonds for infrastructure projects.” (7 point scale from “Strongly Disagree” to “Strongly Agree”)
  - a. Greenhouse gas emissions
  - b. Climate and natural disaster risks
  - c. Inefficient use of resources
  - d. Pollution



- e. Biodiversity loss and ecosystem degradation
  - f. Human rights violations
  - g. Poor working conditions
  - h. Lack of community health, safety and security
  - i. Involuntary or forced resettlement
  - j. Lack of consideration of cultural heritage
  - k. Non-compliance with government mandates and regulations
  - l. Lack of transparency and accountability
  - m. Unethical practices
  - n. Misaligned interests
- 23.** Indicate your agreement with this statement: “\_\_\_\_\_ should play a role in assessing and managing ESG risks related to surety bonds.” (7 point scale from “Strongly Disagree” to “Strongly Agree”)
- a. Credit rating agencies
  - b. Insurance regulators
  - c. Insurance and reinsurance intermediaries (i.e. brokers and agents)
  - d. Insurers and reinsurers
  - e. Project owner
  - f. Project contractor (i.e. principal)
- 24.** Indicate your agreement with the following statements: (7 point scale from “Strongly Disagree” to “Strongly Agree”)
- a. ESG risks can be quantified.
  - b. ESG risk assessments on surety bond underwriting results can be quantified.
  - c. ESG risk assessments should influence surety bond underwriting process.
  - d. ESG risk assessments should influence surety bond pricing.
  - e. Integrating ESG risk assessments into surety bond underwriting would adversely affect your company’s ability to construct, market, and sell surety bond products.
  - f. Surety bond underwriters’ compensation should be influenced by their ability to assess ESG risks.
  - g. Surety bond applications provide adequate data for assessing projects’ ESG risks.
  - h. Earlier participation of surety bond underwriters in the project life cycle would improve awareness of ESG risks.
  - i. Reinsurance terms and conditions affect how ESG risk assessments are integrated into surety bond underwriting.
  - j. A favorable client-underwriter relationship reduces the need to integrate ESG risk assessments into surety bond underwriting.
  - k. Universal guidelines on incorporating ESG risk assessments into the underwriting of surety bonds for infrastructure projects are necessary.
- 25.** Indicate your agreement with this statement: “Project owners’ and project contractors’ \_\_\_\_\_ predict surety bond underwriting results.” (7 point scale from “Strongly Disagree” to “Strongly Agree”)
- a. Capital
  - b. Capacity
  - c. Character
- 26.** Indicate your agreement with this statement: “Project owners’ and project contractors’ \_\_\_\_\_ is impacted by its ESG risk assessments.”(7 point scale from “Strongly Disagree” to “Strongly Agree”)
- a. Capital
  - b. Capacity
  - c. Character
  - d. Explain why these criteria are, or are not, impacted by ESG risk assessments.



27. What does your company do well in terms of ESG risk management?
28. How could your company improve in terms of ESG risk management?
29. What are the barriers that prevent your company from improving its management of ESG risks?
30. What does the industry do well in terms of ESG risk management?
31. How could the industry improve in terms of ESG risk management?
32. What are the barriers that prevent the industry from improving its management of ESG risks?

### Company practices regarding ESG risk assessment in surety bond underwriting

33. Does your company have a formal ESG risk assessment process when underwriting surety bonds for infrastructure projects?
34. Which industries, sectors, projects, or activities are **restricted (i.e. regulated)** by your company's surety underwriting guidelines because of ESG risk concerns? If known, please indicate the specific ESG risk that causes the restriction(s).
35. Which industries, sectors, projects, or activities are **excluded** by your company's surety underwriting guidelines because of ESG risk concerns? If known, please indicate the specific ESG risk that causes the exclusion(s).
36. Indicate your agreement with this statement: "My company considers the impact of \_\_\_\_\_ when underwriting surety bonds for infrastructure projects." (7 point scale from "Strongly Disagree" to "Strongly Agree")
  - a. Greenhouse gas emissions
  - b. Climate and natural disaster risks
  - c. Inefficient use of resources
  - d. Pollution
  - e. Biodiversity loss and ecosystem degradation
  - f. Human rights violations
  - g. Poor working conditions
  - h. Lack of community health, safety and security
  - i. Involuntary or forced resettlement
  - j. Lack of consideration of cultural heritage
  - k. Non-compliance with government mandates and regulations
  - l. Lack of transparency and accountability
  - m. Unethical practices
  - n. Misaligned interests
37. Indicate your agreement with these statements as they regard ESG risks to surety bond underwriting: (7 point scale from "Strongly Disagree" to "Strongly Agree")
  - a. My company provides me adequate written guidance to assess environmental risks
  - b. My company provides me adequate training to assess and manage environmental risks
  - c. My training improved how I assess and manage environmental risks
  - d. My knowledge of how to assess and manage environmental risks is current
  - e. My company provides me adequate written guidance to assess social risks
  - f. My company provides me adequate training to assess and manage social risks
  - g. My training improved how I assess and manage social risks
  - h. My knowledge of how to assess and manage social risks is current
  - i. My company provides me adequate written guidance to assess governance risks
  - j. My company provides me adequate training to assess and manage governance risks
  - k. My training improved how I assess and manage governance risks





- l.** My knowledge of how to assess and manage governance risks is current
- 38.** How does your company provide written guidance for assessing and managing ESG risks? (Company policy, Generic underwriting guidelines or criteria, Specific lines of business underwriting guidelines, No written guidance is provided, I do not know)
  - a.** How could these written documents be improved?
- 39.** How does your company provide training for assessing and managing ESG risks? (Written formats, recorded online training, interactive online training, individual instruction, team or department meetings, small audience assemblies, large audience assemblies)
  - a.** How do you think your company's training could be improved?
- 40.** Indicate the frequency with which your company uses the listed methods to confirm contractors' (i.e. principals') management of the ESG risks. (7 point scale from "Never" to "Always")
  - a.** Desktop review of application
  - b.** Review of internal documents
  - c.** Phone interviews with contractor representatives
  - d.** Face-to-face interviews with contractor representatives
  - e.** Announced field visits
  - f.** Unannounced field visits

### Post-survey question

- 41.** Are there any other insights on this topic that you would like to share?



# Literature review

Numerous studies concerning surety bonds emphasise contract failure based on traits of the contractor. Severson, Russel, & Jaselskis, (1994) associated defaults with the contractors' financial traits and management practices. Similarly Fadhil Abidali and Harris (1995) predicted contract failure from contractor's financial measures and assessments of their managerial competence. These contractor-trait models were extended by Kangari and Bakheet (2001) to include contractors' past performance, capacity, and business continuity. Bayraktar and Hastak (2010) created a logistic regression model based on measures similar to the above and got practitioners to confirm its validity when applying it to hypothetical observations. However, Tserng, Liao, Tsai, and Chen (2011) noted that the models incorporating contractors' traits often use qualitative and quantitative measures that are not available to underwriters until after the bonding agreement has been completed. As a result, the authors created a default prediction model from contractors' stock market data. Finally, El-Mashaleh and Horta (2016) demonstrated that the bonding decision, not just risk assessment, can be determined using measures of contractors' efficiency.

A smaller stream of research considers contractor defaults based on traits of the project. March and Fayek (2010) used a fuzzy logic model that accounted for project type, size, costs, and contract clauses. In a similar study, Fayek and Awad (2012) integrated experts' estimations and quantitative data to predict contractor default based on project aspects, project team traits, contractual risks, and project management.

This exploratory study differs from the reviewed writings in that it is orientated at a more macro level of analysis. A precedent for our orientation is provided by Russell and Zhai (1996) who argued that contractors' failures were determined by internal and external factors. They created a default model based on the trend, interplay, and volatility of internal financial measures and external economic indicators such as interest rates, GNP, and consumer price index. However, this study has two substantial points of departure from Russell and Zhai's precedent. First, the macro level factors emphasised in this study are environmental, social and governance (ESG) risk factors of sustainable development. Second, this study does not concern itself with predicting contractual failure. Instead, it prioritises the influence of ESG risks on surety bond underwriting. The findings have provided illumination on *how* ESG risks influence the underwriting process, *who* bears responsibility for identifying and mitigating the negative impacts of ESG risks, and *which* ESG risks are currently more routinely and more extensively assessed.





**“The Principles for Sustainable Insurance provide a global roadmap to develop and expand the innovative risk management and insurance solutions that we need to promote renewable energy, clean water, food security, sustainable cities and disaster-resilient communities.”**

**Ban Ki-moon, UN Secretary-General (June 2012)**

About UN Environment’s Principles for Sustainable Insurance Initiative (PSI Initiative)

Endorsed by the UN Secretary-General and insurance industry CEOs, the Principles for Sustainable Insurance (PSI) serve as a global framework for the insurance industry to address environmental, social and governance risks and opportunities—and a global initiative to strengthen the insurance industry’s contribution as risk managers, insurers and investors to building resilient, inclusive and sustainable communities and economies.

Developed by UN Environment’s Finance Initiative, the PSI was launched at the 2012 UN Conference on Sustainable Development (Rio+20), and has led to the largest collaborative initiative between the UN and the insurance industry. Nearly 120 organisations worldwide have adopted the four Principles for Sustainable Insurance, including insurers representing more than 25% of world premium volume and USD 14 trillion in assets under management.

The vision of the PSI Initiative is of a risk-aware world, where the insurance industry is trusted and plays its full role in enabling a healthy, safe, resilient and sustainable society. Its purpose is to better understand, prevent and reduce ESG risks, and to better manage opportunities to provide quality and reliable risk protection.

In December 2016, UN Environment—through its PSI Initiative and its Inquiry into the Design of a Sustainable Financial System—and insurance regulators and supervisors launched the Sustainable Insurance Forum for Supervisors (SIF). The SIF is an international network of insurance regulators and supervisors that aims to promote cooperation on critical sustainability challenges and opportunities.

[www.unepfi.org/psi](http://www.unepfi.org/psi)

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