



THE PINKERTON RISK INDEX

# A WORLD RANKING OF BUSINESS RISK

**A Holistic Approach to  
Non-Insurable Risk**



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# EXECUTIVE SUMMARY

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The Pinkerton Risk Wheel (PRW) provides a mutually-exclusive categorization of the most important business risks facing companies today. In order to highlight Pinkerton's extensive expertise in understanding and managing business risk, this report and the accompanying database build on the PRW to provide a comprehensive assessment of business risks at the country level, for all countries in the world.

The report divides risks into four broad quadrants:

- Hazard & Event Risk
- Operational & Physical Risk
- Technology & Informational Risk
- Market & Economic Risk

Each of those quadrants is then divided into three subcategories, or nodes, and each node is further divided into five subnodes. The goal of this granular division is to clearly identify and delineate the types of threats that impact business operations globally and categorize them in a way that allows decision-makers to understand risk on a holistic level.

Leveraging data from over 80 distinct informational sources, including both proprietary and publicly available sources from international organizations, Pinkerton then cross-referenced the different types of threats represented by these subnodes against the probability and prevalence of those risks across the globe. The end result, the Pinkerton Risk Index, effectively illustrates where risk exists and to what degree in every country in the world.

To aggregate this information into combined risk indices, we need both a theoretical foundation regarding risk and statistical methods for combining diverse variables which can be applied in situations where variable measures appear in uncommon (or incommensurable) units. Our theoretical foundation accords with the standard definition of risk in Risk Management—namely, **Threat x Probability x Business Impact**. More details on this can be found in the Technical Appendix of this report.



# OVERVIEW AND METHODOLOGY

The global risk landscape changes on a daily basis. Many of the threats that exist today did not exist five years ago, and the threats that will confront organizations across the globe two years from now may not exist today.

In a world where new and emerging threats pose a significant danger to a business organization's people, property and proprietary information, understanding and responding to that changing threat landscape is a challenging proposition. Recognizing risks, accurately assessing vulnerabilities and prioritizing protective resources requires a deep and nuanced appreciation for market- and industry-specific factors, and the corresponding ability to evaluate real-world perils in a real-world context.

As the threats facing organizations globally continue to change and evolve, it is important for business leaders to take a holistic view of risk management. A fundamental concept behind Pinkerton's approach is that potential areas of risk cannot be viewed independently. Focusing on one component of risk without understanding the potential effect on the organization as a whole can lead to unintended consequences. These concepts are illustrated by Pinkerton's Risk Wheel – a tool designed to help decision makers understand not only the different types of risk impacting business continuity, but the interconnectivity of the four broad categorizations of risk.

The Pinkerton Risk Wheel is divided into four broad quadrants that categorize the different types of risk faced by businesses around the world. The four primary categories of risk captured by the risk wheel include:

- Hazard & Event Risk
- Operational & Physical Risk
- Technology & Informational Risk
- Market & Economic Risk

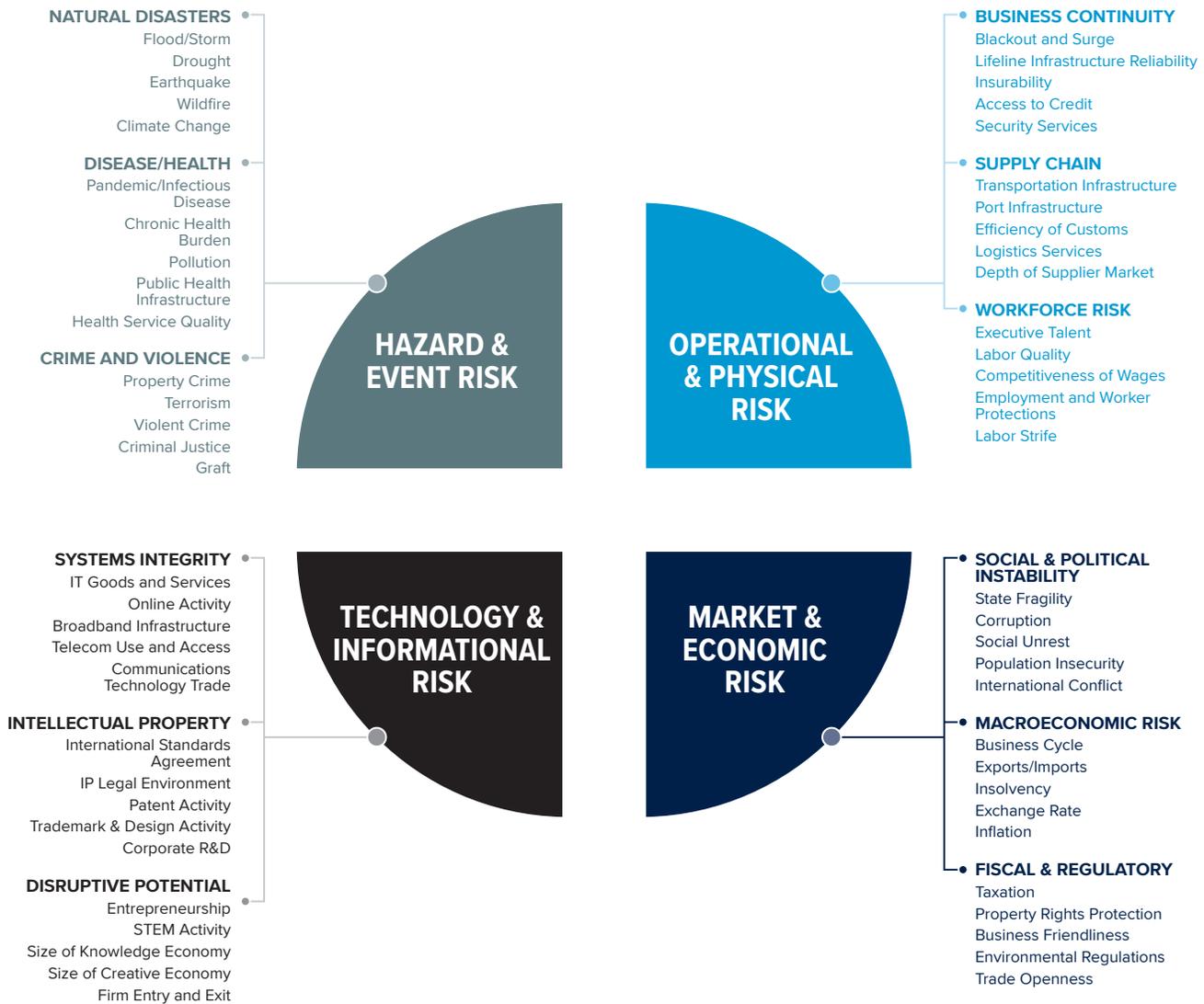
As noted, these quadrants, while distinct, should be viewed holistically as threats in one risk area ultimately can impact others. For example, one can view Hazard & Event risk as something that is likely to be more singular or incident related; however, this could clearly impact operations. Threats in the Market & Economic risk quadrant largely impact corporate strategy which, in turn, can impact operational and technology (or corporate governance) risks. And so on.

One of the primary challenges facing current models for calculating risk is a pervasive lack of context. To perform an accurate and holistic risk assessment, it is imperative to not only understand the threats facing an organization, but also the probability of those threats occurring—and to what degree those threats could impact business objectives. That all-important context is a critically important piece of the risk management puzzle: the backdrop against which all potential threats can be brought into sharp relief.

In 2017, Pinkerton advanced its Risk Wheel to better account for the different threats that comprise each quadrant of risk. In this new model, each quadrant is comprised of three categories, or nodes, that represent threat categories within each quadrant.



Each node is then further divided into five distinct subnodes that represent threats that can impact business operations on a daily basis.



The need for such a model is clear. At the same time that risk calculations are becoming more complex, the need to accurately perform those calculations is becoming more urgent than ever. The increasingly global nature of the world economy, and the emergence of new technologies and increasingly complex international supply chains have created extraordinary opportunities, but they have also introduced complex, new risk factors and vulnerabilities. Traditional parameters are changing. Long-held assumptions are being challenged. Whether it is a natural disaster or a precipitous stock market plunge, businesses are understandably worried about their ability to withstand those formerly rare, but increasingly prevalent events that can shift the bedrock of an industry or a company in an instant.

## The Total Risk Perspective— The Pinkerton Risk Index

The Pinkerton Risk Index takes the concept laid out by the Pinkerton Risk Wheel (PRW) to a whole new level by clarifying to business leaders exactly where risk occurs around the world, and what the precise nature of that risk is most likely to be. If the PRW reflects the general threat landscape, the Pinkerton Risk Index brings the features on that landscape into sharp relief, describing not only what could happen, but what is happening with unprecedented clarity and specificity.

The power of a tool like the Pinkerton Risk Index comes from its inherent impartiality: its ability to provide an agnostic expression of inherent threat irrespective of vulnerability—which allows security and risk management professionals to assess the probability of those threats impacting business operations. Working with a much larger quantitative data set also yields more comprehensive and subsequently more meaningful conclusions. Facts and figures from the last year or two are not sufficient: a longer-term approach that blends historical trends and new and emerging threats is required.

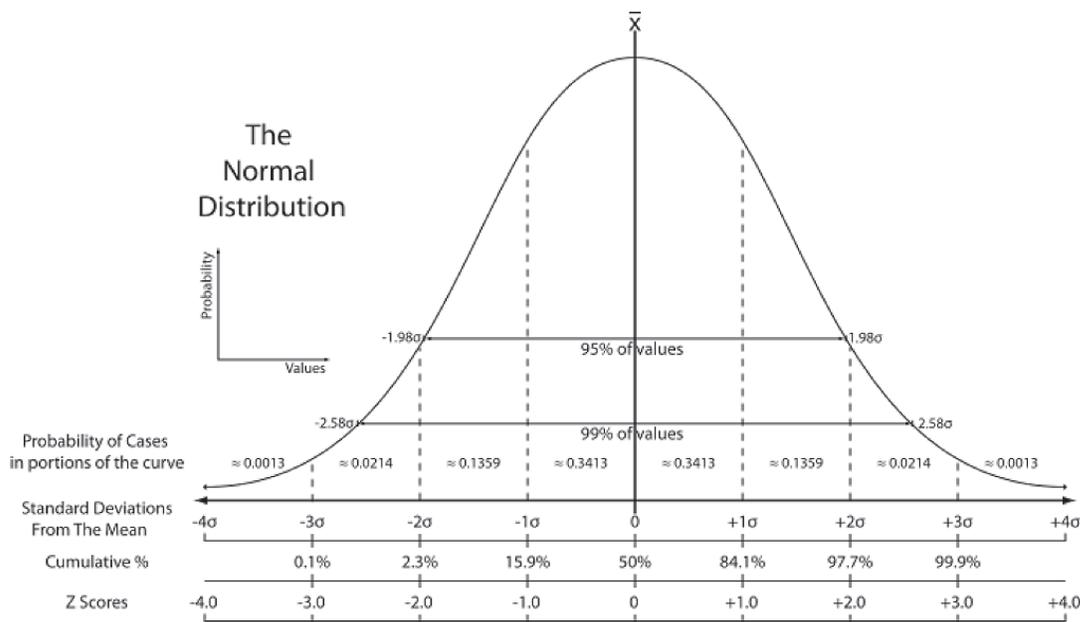
The Pinkerton Risk Index was developed over years of work, with analyses and information gathered from over 80 distinct data sources. Examples include the Heritage Foundation, Insurance Information Institute, Center for

Systemic Peace, United Nations, World Bank, and the Centre for Research on the Epidemiology of Disasters.

The finished product is the result of innovative work by scholars and security professionals alike, a collaborative endeavor that contains inputs and insights from experts around the world, including professors and experienced specialists in their respective fields.

The country-specific and regional considerations that the Pinkerton Risk Index are based on range from complex geopolitical calculations to the state of the legal landscape in different nations. Rigorous scientific theory and statistical analysis connect inherent risks to specific business indices, creating an overall threat analysis tailored for businesses. The Pinkerton Risk Index incorporates 83 separate risk factors, such as natural disasters, infectious disease, population health, violent crime, property crime, terrorism, economic structure, social and political institutions, societal upheaval, and information and technology. The final Pinkerton Risk Index report is generated in part from sophisticated econometric and spatial analyses of those risks, and is converted into an overall risk profile that is available on a country level internationally, and, remarkably, on a county level in the United States.

Pinkerton's Risk Index further refines these metrics to provide a cleaner analytical approach—one that



can be better customized to fit the specific needs of clients anywhere in the world, and at a greater level of depth than ever before. The result is improved reporting clarity to help clients make the best business decisions possible, regardless of the geopolitical landscape.

## Our Methodology

Pinkerton's Risk Index provides a comprehensive business risk analysis based on analysis drawn from a compilation of over 80 accredited sources. The information is aggregated into combined risk indices, using both a theoretical foundation regarding risk and statistical methods that combine diverse variables, which can be applied in situations where variable measures appear in uncommon units. The theoretical foundation of these calculations accords with the standard deviation of risk in Risk Management. Pinkerton's methodology utilizes the most recent data available to calculate figures for each category, resulting in reports that are as current as possible.

The data that is expressed in standardized terms (using an aggregated z-score method) takes the calculated

country risk score, subtracts the mean risk score, and then divides by the standard deviation.

**What this means:** In this model a country with a score of zero is precisely the mean of the distribution with respect to the category of interest. A country with an aggregated z-score of 1 is exactly 1 standard deviation above normal with respect to the risk category of interest. Similarly, a country with a risk score of -1 is exactly 1 standard deviation below the mean. In layman's terms: the greater the positive risk score, the higher the risk relative to the mean for that country in regards to the area of interest and the lower the score (i.e., a negative score) indicates the country has less risk.

Note: Formula's for all statistical models used can be found in the Technical Appendix at the back of this document.

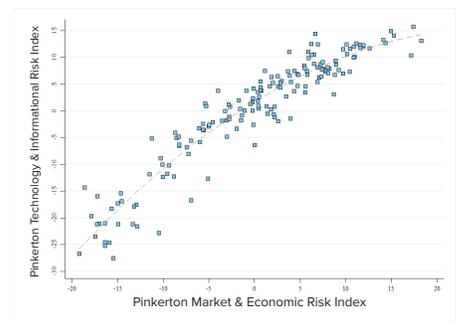
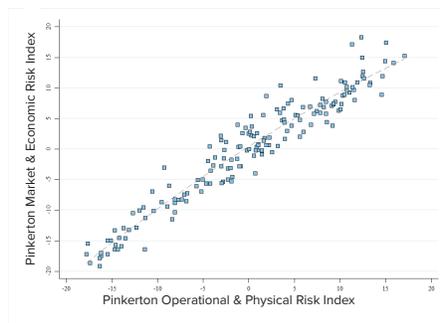
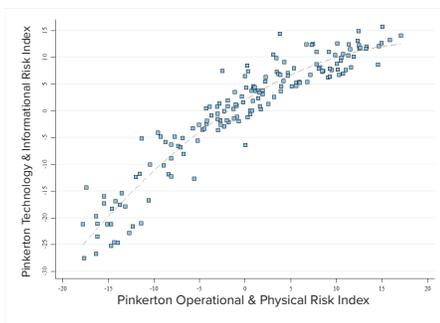
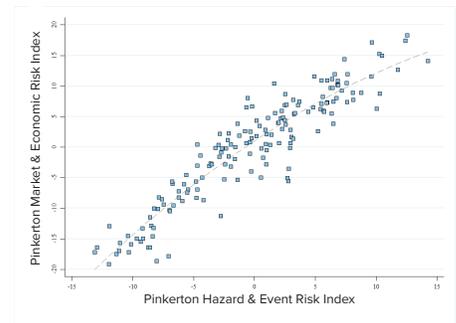
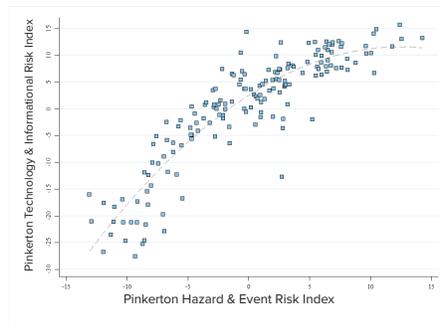
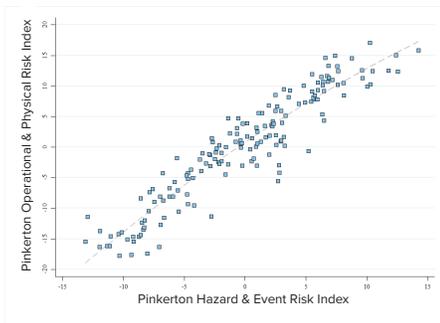
# A HOLISTIC APPROACH

## Overview

Pinkerton is able to quantify the most important risks facing companies today on a country-by-country basis based on the four major categories represented within the Pinkerton Risk Wheel (PRW). While each quadrant of the PRW brings attention to different categories of risk, viewing all four quadrants together helps organizations begin to view and conceptualize risk management in a more holistic manner. Failure to adopt such a comprehensive perspective may leave those organizations exposed to unforeseen and unplanned for hazards.

## Findings of Statistical Analysis – A Strong Correlation

A holistic approach to business risk is supported by strong, positive correlations between quadrants of risk. The index scores on each dimension of the scatterplots below represent the sum of standardized (z-scored) node indices within each quadrant. Because quadrants of risk are highly positively correlated, our statistical analysis implies that an increase in business risk along one dimension produces an analogous increase in risk along other dimensions.

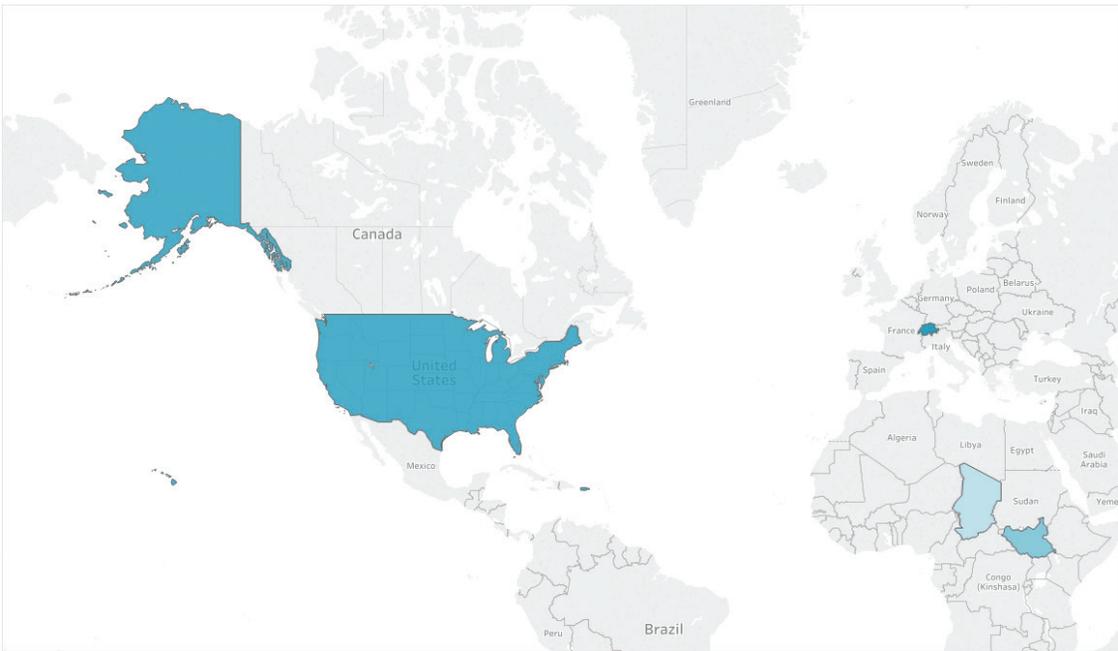


# COUNTRY-SPECIFIC FINDINGS

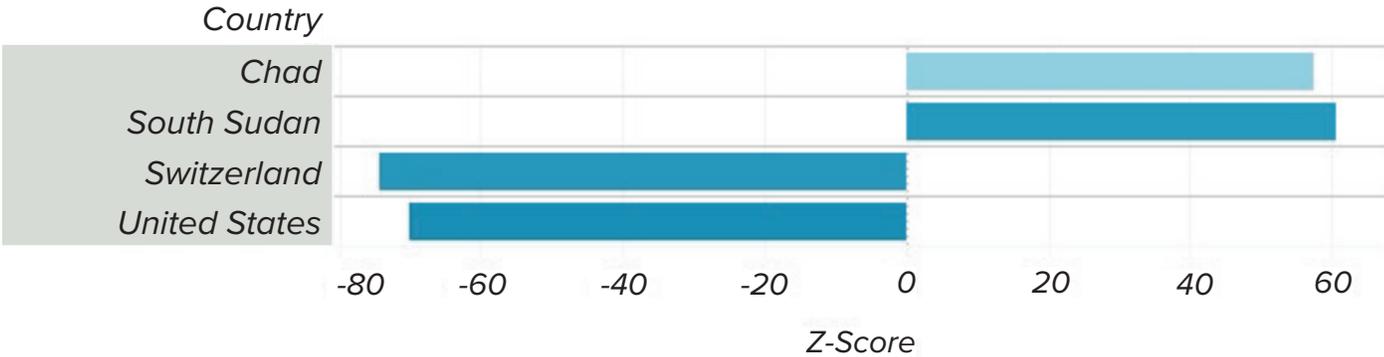
The following section provides a relatively comprehensive view of the data that is available in our customized reports. For this section we focused on the top two ranked countries (Switzerland and the United States) and the bottom two ranked countries (Chad and South Sudan).

Included in this section is an overview of the overall risk for each of the four countries noted below and detailed findings for each of the four quadrants of the Pinkerton Risk Wheel at both a nodal and sub-nodal level using the methodology detailed in the previous section of this document.

**Note: The purpose of this report is to demonstrate some of the data and how it could be visualized and is not intended to be a comprehensive example. The customized reports provided by Pinkerton also provide richly detailed analysis of the data which is not illustrated here. This analysis is proprietary and based on the relevance to the individual client.**



*Overall Risk Rating Compared To Relative Countries*



In relation to the compared countries, Switzerland ranks 1 of 4 for risk, indicating that Switzerland experiences less overall risk than the other four countries. The United States ranks 2 of 4; Chad ranks 3 of 4; and, South Sudan ranks 4 of 4.

# FINDINGS BY QUADRANT:



## HAZARD & EVENT RISK OVERVIEW

**NATURAL DISASTERS.** Major natural disasters damage physical assets, disrupt business operations, and impact economic activity. This node covers the five most important categories of natural disaster risk.

- **Flood and Storm:** Catalogs physical damage and human death toll from floods and storms, averaged over modern history.
- **Drought:** Catalogs physical damage and human death toll from drought, averaged over modern history.
- **Earthquake:** Catalogs physical damage and human death toll from earthquakes and landslides, averaged over modern history.
- **Fire and Explosion:** Catalogs physical damage and human death toll from wildfire and volcanoes, averaged over modern history.
- **Climate Change:** Describes exposure to water stress, the rising sea level, and long-run climate damages associated with forecasted temperature change reported in the most recent IPCC assessment report.

**DISEASE AND HEALTH.** Pandemics, epidemics and other public health issues affect the performance of local employees, put business travelers at risk, and give rise to a wide range of business costs. This node is divided into the following dimensions:

- **Pandemic and Infectious Disease:** Describes the prevalence of infectious disease and presence of physical and social factors that influence susceptibility to new epidemics.
- **Chronic Disease Burden:** Models the prevalence of chronic diseases that impact life expectancy, ranging from malnutrition to diabetes.
- **Pollution:** Identifies the presence and magnitude of pollution problems that adversely impact human health.
- **Public Health Infrastructure:** Catalogs public investments in health infrastructure, including sanitation facilities and immunization programs.
- **Health Services Quality:** Describes the quality of healthcare infrastructure as reflected by access to care and mortality outcomes.

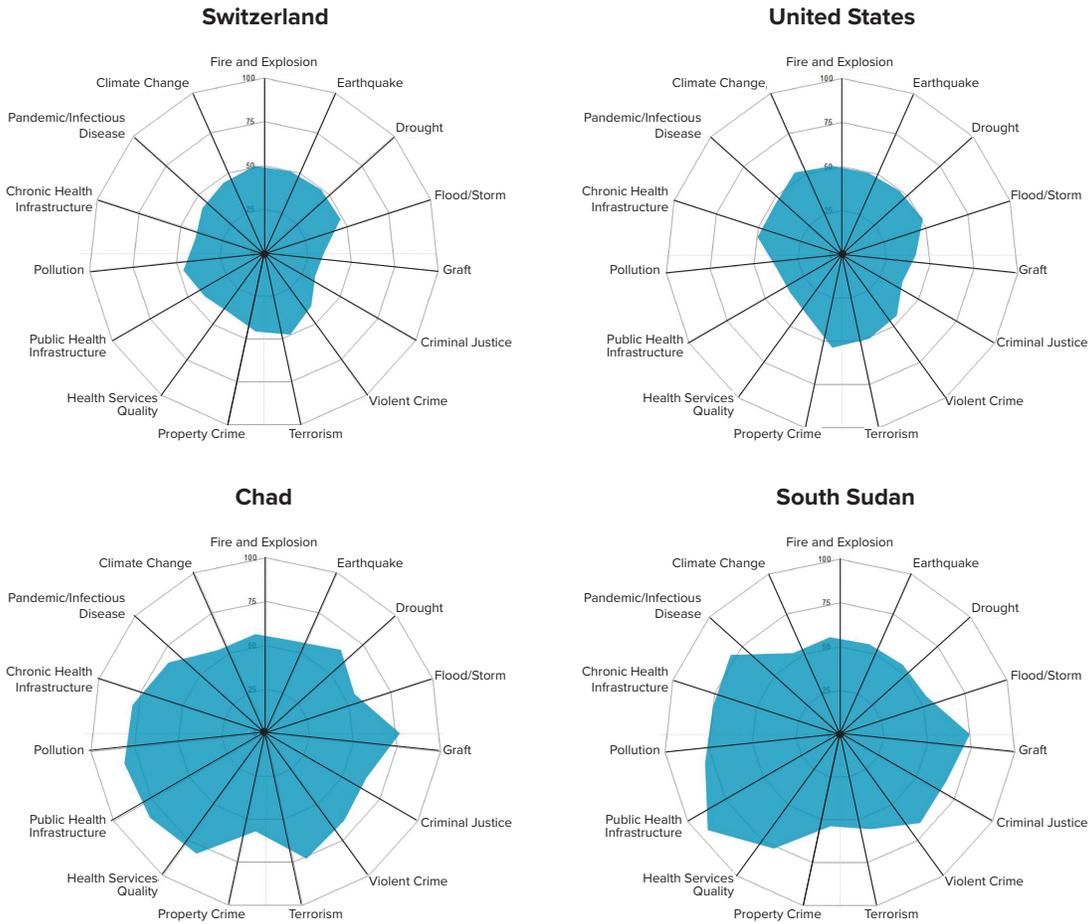
**CRIME AND VIOLENCE.** Criminal elements within society pose substantial risk to firms, and they vary widely across countries. This node divides the accompanying risks into the following subcategories:

- **Property Crime:** Describes the prevalence of crime affecting physical assets, including theft and burglary.
- **Terrorism:** Quantifies the prevalence of terrorism events and accompanying casualties.
- **Violent Crime:** Catalogs the incidence of homicide, aggravated assault, and other violent events.
- **Criminal Justice:** Assesses the capacity of local institutions to effectively punish criminal activity.
- **Graft:** Describes the relevance and magnitude of political corruption that increases cost of doing business locally.

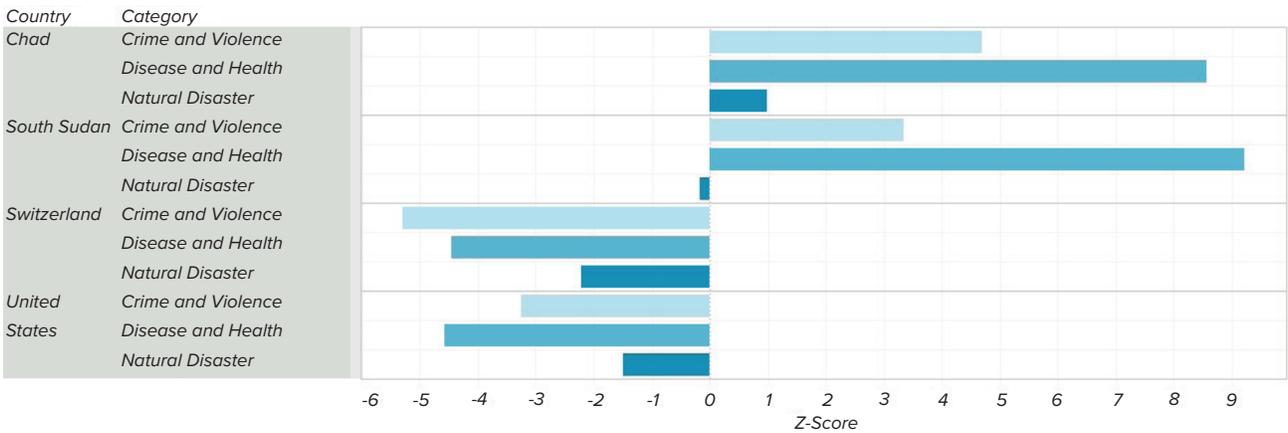
NATURAL DISASTERS  
DISEASE/HEALTH  
CRIME

HAZARD &  
EVENT RISK

# Hazard & Event Risk for Switzerland, the U.S., Chad, and South Sudan



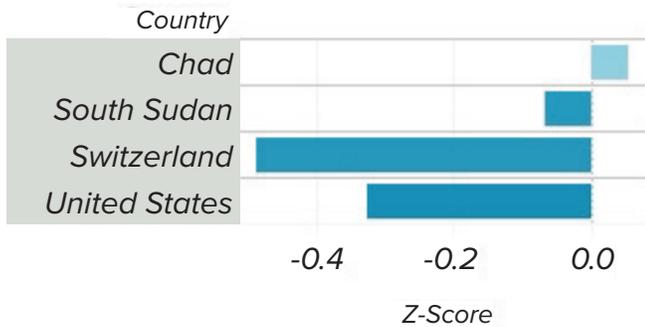
## Overall Hazard & Event Risk Comparison



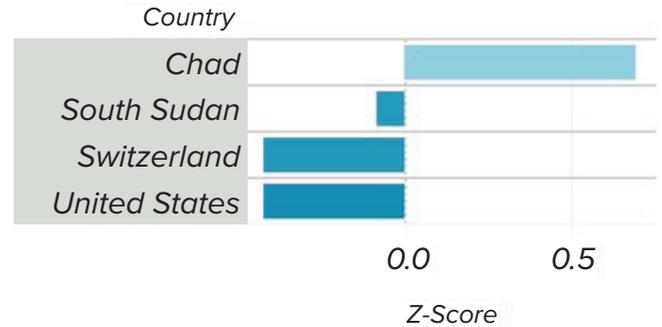
## Natural Disasters Risk

Major natural disasters damage physical assets, disrupt business operations, and impact economic activity. This node covers the five most important categories of natural disaster risk.

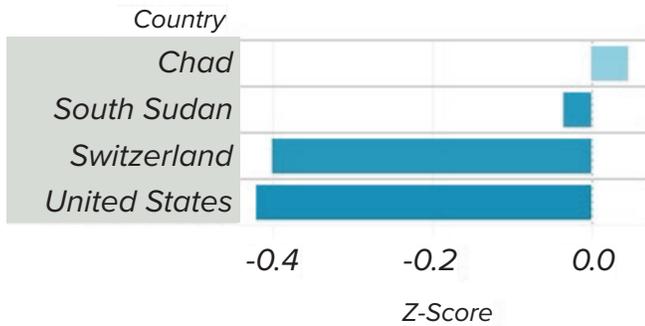
**Flood/Storm:** Catalogs physical damage and human death toll from floods and storms, averaged over modern history.



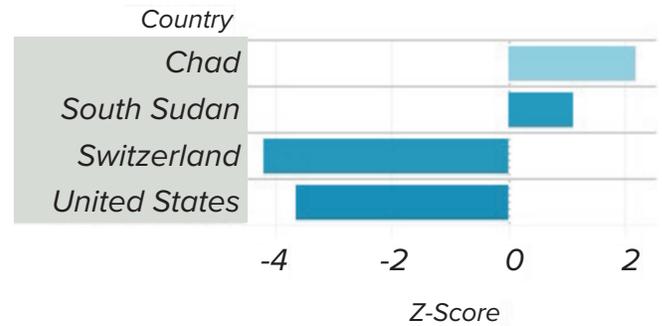
**Drought:** Catalogs physical damage and human death toll from drought, averaged over modern history.



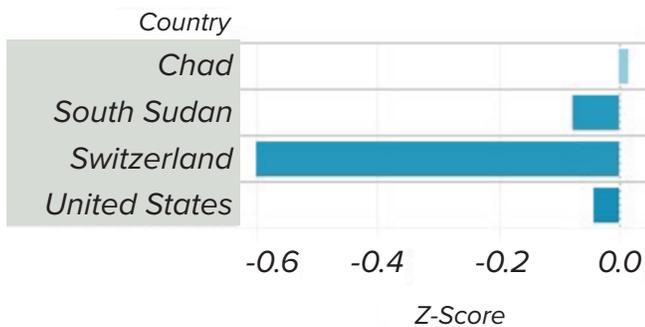
**Earthquake:** Catalogs physical damage and human death toll from earthquakes and landslides, averaged over modern history.



**Fire and Explosion:** Catalogs physical damage and human death toll from wildfire and volcanoes, averaged over modern history.



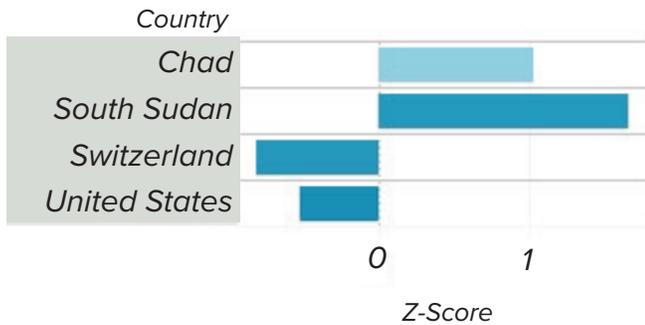
**Climate Change:** Describes exposure to water stress, the rising sea level, and long-run climate damages associated with forecasted temperature change reported in the most recent IPCC assessment report.



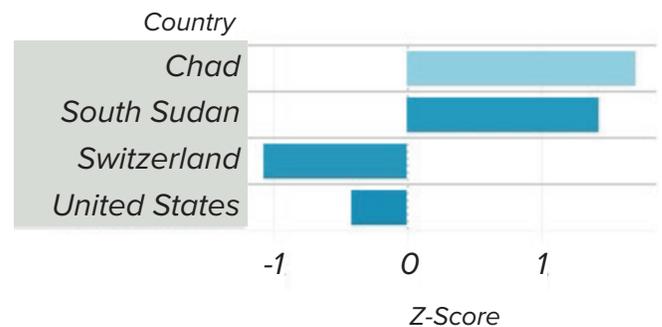
## Disease and Health Risk

Pandemics, epidemics and other public health issues affect the performance of local employees, put business travelers at risk, and give rise to a wide range of business costs. This node is divided into the following dimensions:

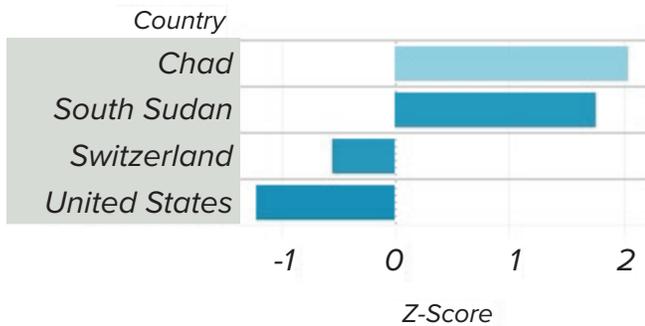
**Pandemic/Infectious Disease:** Describes the prevalence of infectious disease and presence of physical and social factors that influence susceptibility to new epidemics.



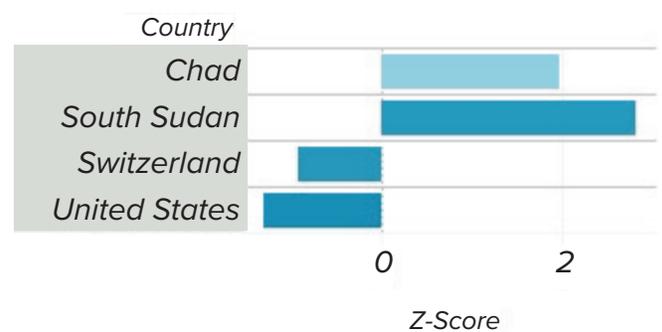
**Chronic Health Infrastructure:** Models the prevalence of chronic diseases that impact life expectancy, ranging from malnutrition to diabetes.



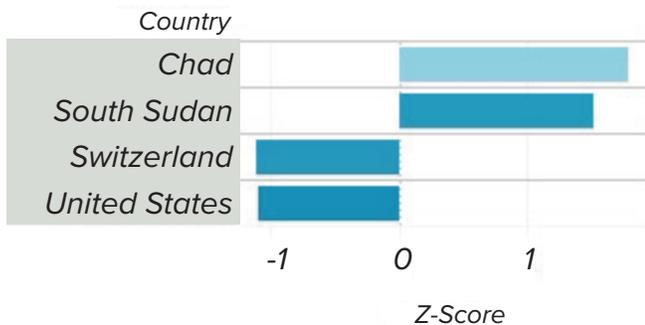
**Pollution:** Identifies the presence and magnitude of pollution problems that adversely impact human health.



**Public Health Infrastructure:** Catalogs public investments in health infrastructure, including sanitation facilities and immunization programs.



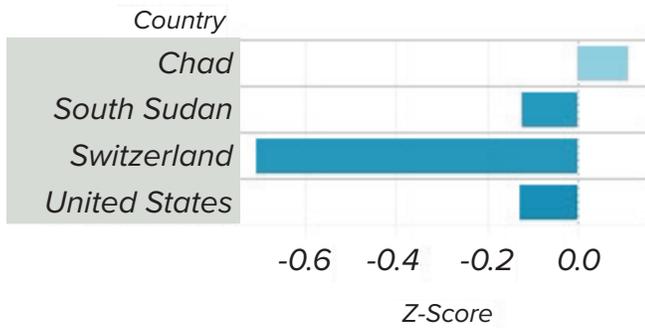
**Health Services Quality:** Describes the quality of healthcare infrastructure as reflected by access to care and mortality outcomes.



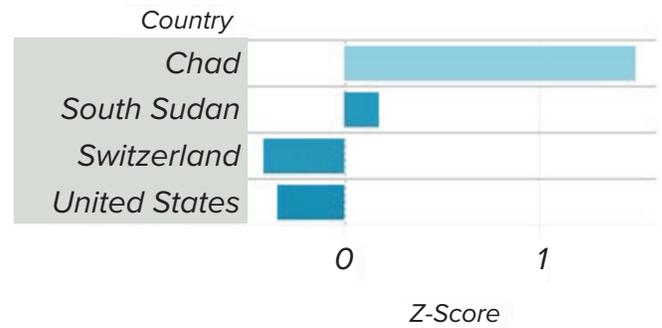
## Crime and Violence Risk

Criminal elements within society pose substantial risk to firms, and they vary widely across countries. This node divides the accompanying risks into the following subcategories:

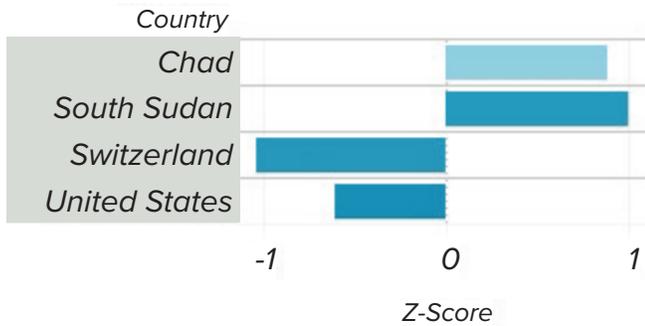
**Property Crime:** Describes the prevalence of crime affecting physical assets, including theft and burglary.



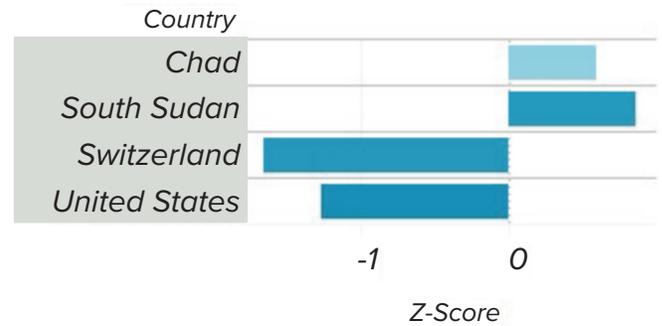
**Terrorism:** Quantifies the prevalence of terrorism events and accompanying casualties.



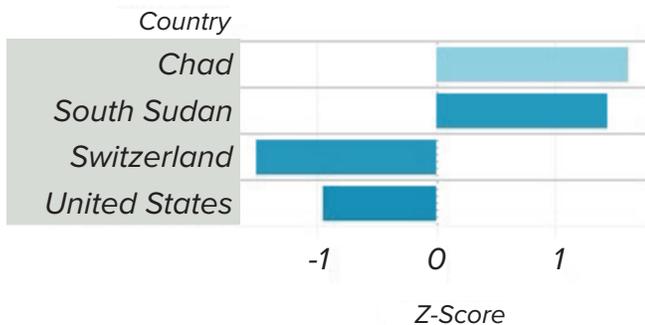
**Violent Crime:** Catalogs the incidence of homicide, aggravated assault, and other violent events.



**Criminal Justice:** Assesses the capacity of local institutions to effectively punish criminal activity.



**Graft:** Describes the relevance and magnitude of political corruption that increases cost of doing business locally.





## OPERATIONAL & PHYSICAL RISK OVERVIEW

**BUSINESS CONTINUITY RISK.** Business operations can be disrupted in a variety of ways. This node assesses local and national factors that affect the capacity of organizations and businesses to respond to and recover from major shocks. This node is divided into the following subnodes:

- **Blackout and Surge:** Examines susceptibility to disruptive electrical outages.
- **Lifeline Infrastructure:** Describes the capacity of local infrastructure to maintain business continuity amid unexpected shocks; includes general infrastructure and access to non-electric utilities.
- **Insurability:** Quantifies the strength of local insurance markets to cover damages from insurable events.
- **Access to Credit:** Describes the thickness and robustness of local credit markets, which affect firm access to credit when needed and the accompanying cost of obtaining credit.
- **Security Services:** Examines the extent to which private security provision imposes significant operating costs for businesses. This is influenced, among other things, by the responsiveness of local emergency services.

**SUPPLY CHAIN RISK.** A robust and reliable supply chain is a critical dimension of business operations that varies widely across countries. This node considers the most important factors affecting supply chain risk, including essential components of supply chain infrastructure and accompanying logistical services. The corresponding subnodes are:

- **Transportation Infrastructure:** Captures the density and quality of transport-related infrastructure, including roads.
- **Port Infrastructure:** Rates the capacity and quality of ports for moving goods in and out of the country, both by ship and by air.
- **Efficiency of Customs:** Broadly assesses the ease and cost of moving items through customs.
- **Logistic Services:** Evaluates a nation's logistics performance, including local capabilities to track and trace consignments.
- **Depth of Supplier Market:** Describes the capacity of local markets to source supply needs locally.

**WORKFORCE RISK.** The depth and richness of local labor markets varies widely across countries. This node considers a broad range of factors that influence the business costs of acquiring and maintaining an effective workforce. The category is divided into the following subnodes:

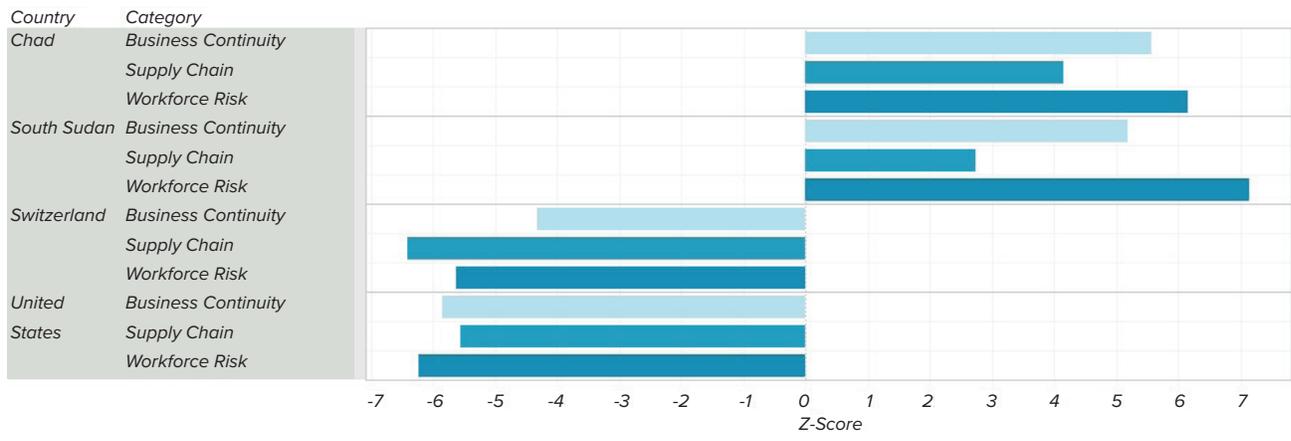
- **Executive Talent:** Depth of local talent pool for educated knowledge workers.
- **Labor Quality:** Describes the quality of local workers, including diverse measures of human capital and quality certifications within businesses and organizations.
- **Employment Dynamics:** Assesses the abilities of the national labor market to match skilled workers to businesses.
- **Labor Rights:** Quantifies labor freedom and accompanying rights, which support a vital market for skilled and motivated workers.
- **Labor Strife:** Examines factors that increase the risk of employee dissatisfaction and potential unrest.



# Operational & Physical Risk for Switzerland, the U.S., Chad, and South Sudan



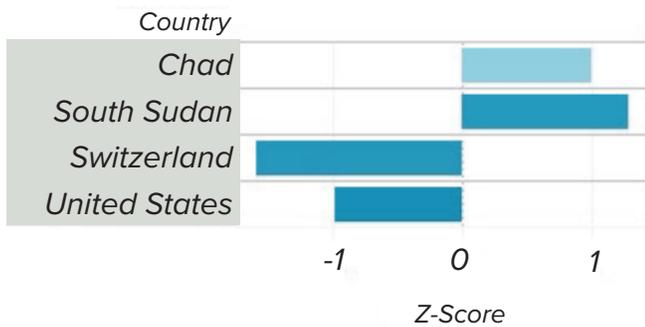
## Overall Operational & Physical Risk Comparison



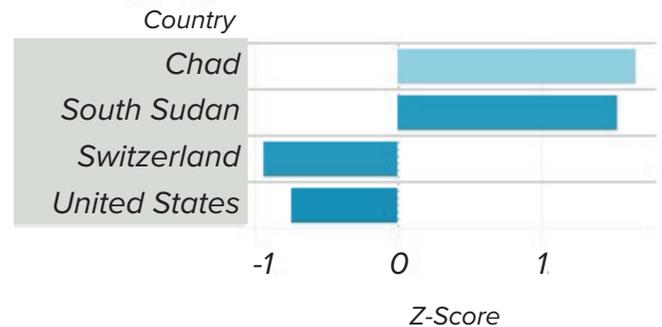
## Business Continuity Risk

Business operations can be disrupted in a variety of ways. This node assesses local and national factors that affect the capacity of organizations and businesses to respond to and recover from major shocks. The node is divided into the following subnodes:

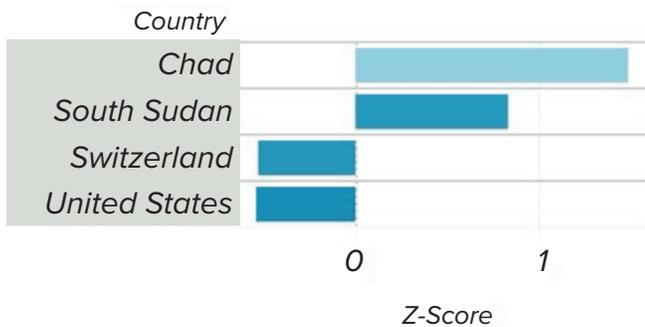
**Security Services:** Examines the extent to which private security provision imposes significant operating costs for businesses. This is influenced, among other things, by the responsiveness of local emergency services.



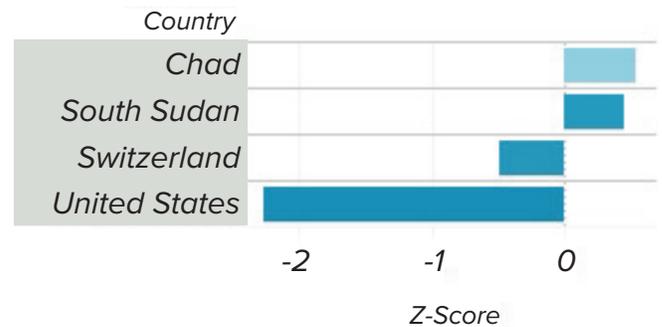
**Lifeline Infrastructure Reliability:** Describes the capacity of local infrastructure to maintain business continuity amid unexpected shocks; includes general infrastructure and access to non-electric utilities.



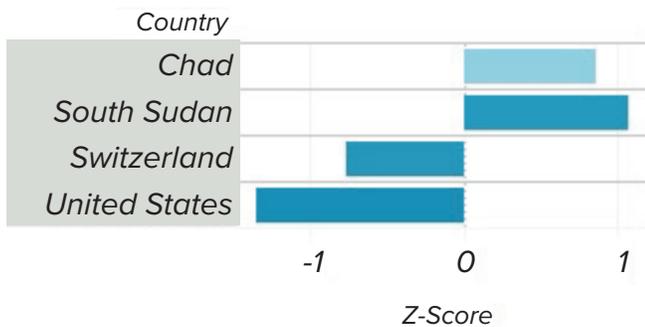
**Blackout and Surge:** Examines susceptibility to disruptive electrical outages.



**Insurability:** Quantifies the strength of local insurance markets to cover damages from insurable events.



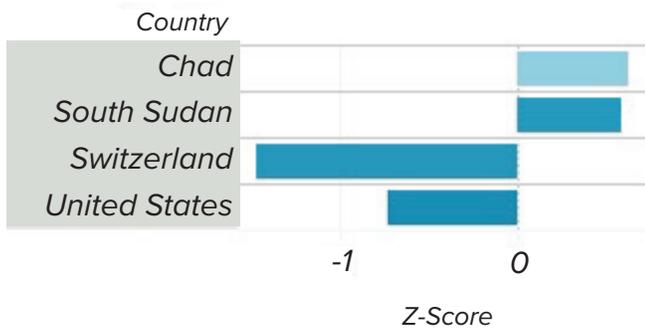
**Access to Credit:** Describes the thickness and robustness of local credit markets, which affect firm access to credit when needed and the accompanying cost of obtaining credit.



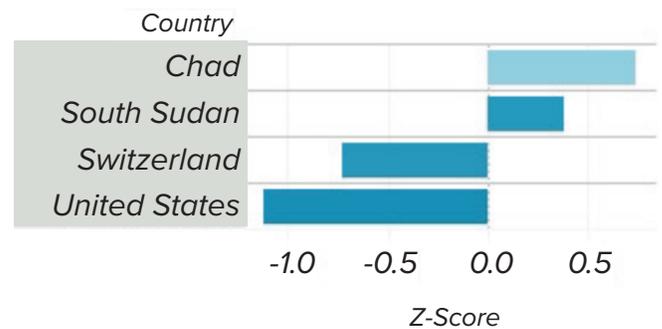
## Supply Chain Risk

A robust and reliable supply chain is a critical dimension of business operations that varies widely across countries. This node considers the most important factors affecting supply chain risk, including essential components of supply chain infrastructure and accompanying logistical services. The corresponding subnodes are:

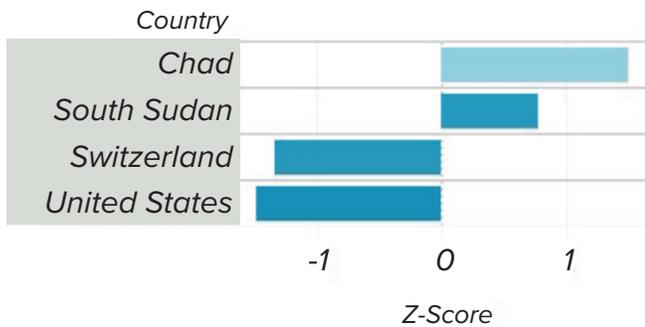
**Transportation Infrastructure:** Captures the density and quality of transport-related infrastructure, including roads.



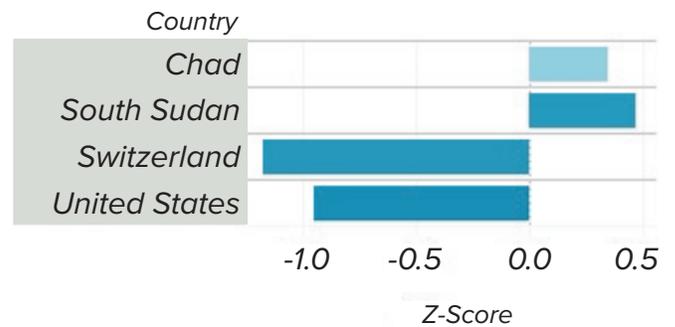
**Port Infrastructure:** Rates the capacity and quality of ports for moving goods in and out of the country, both by ship and by air.



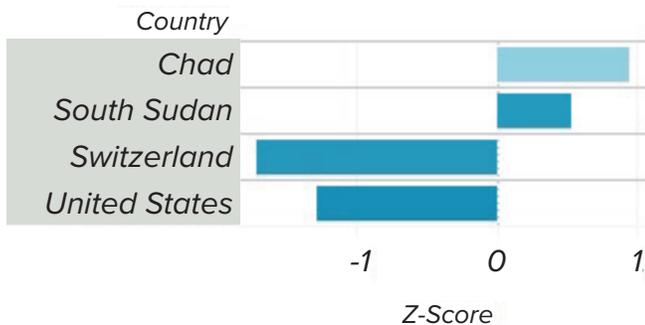
**Efficiency of Customs:** Broadly assesses the ease and cost of moving items through customs.



**Depth of Supplier Market:** Describes the capacity of local markets to source supply needs locally.



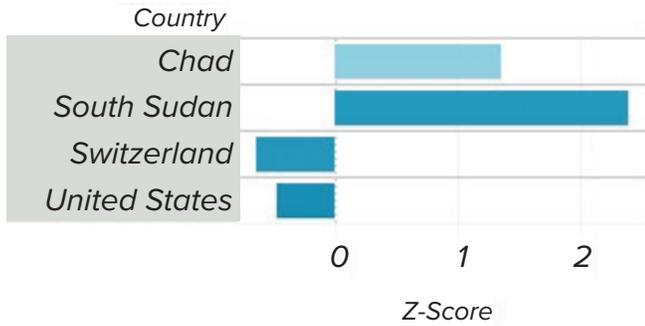
**Logistics Services:** Evaluates a nation's logistics performance, including local capabilities to track and trace consignments.



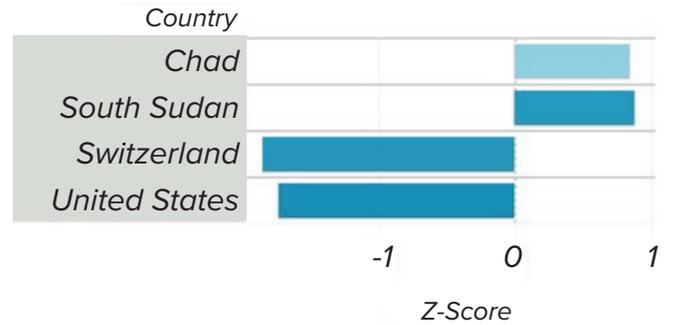
# Workforce Risk

The depth and richness of local labor markets varies widely across countries. This node considers a broad range of factors that influence the business costs of acquiring and maintaining an effective workforce. The category is divided into the following subnodes:

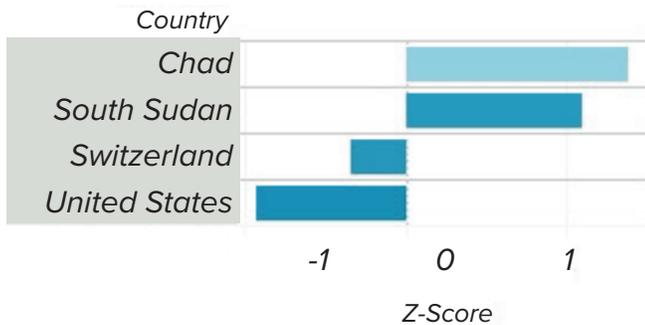
**Labor Quality:** Describes the quality of local workers, including diverse measures of human capital and quality certifications within businesses and organizations.



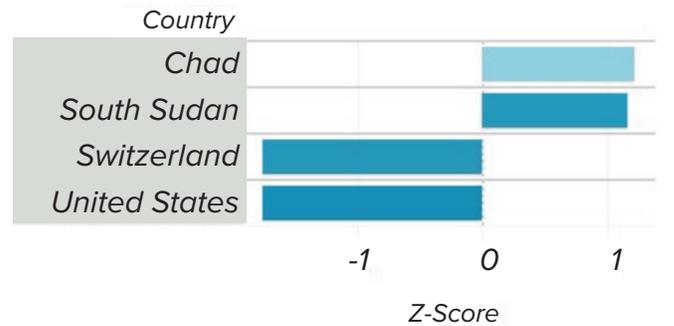
**Labor Strife:** Examines factors that increase the risk of employee dissatisfaction and potential unrest.



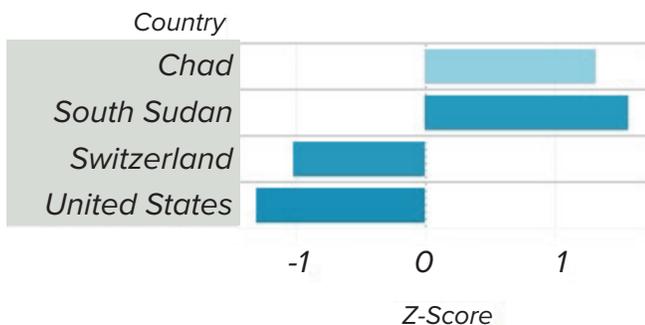
**Employment Dynamics:** Assesses the abilities of the national labor market to match skilled workers to businesses.



**Labor Rights:** Quantifies labor freedom and accompanying rights, which support a vital market for skilled and motivated workers.



**Executive Talent:** Depth of local talent pool for educated knowledge workers.





## TECHNOLOGY & INFORMATIONAL RISK OVERVIEW

**DISRUPTIVE POTENTIAL.** Businesses thrive in dynamic climates, and economies thrive due to “creative destruction.” This node summarizes factors that foster entrepreneurialism, business creativity, and knowledge creation. It is divided into the following subnodes:

- **Entrepreneurship:** Assesses a nation’s startup culture and support for innovative business activity, including new business density, startup skills, and risk attitudes.
- **STEM Activity:** Catalogs human capital and output in areas of Science, Technology, Engineering and Mathematics.
- **Knowledge Economy Size:** Measures the size of knowledge economy as reflected by size of knowledge-intensive sectors within the economy, size of knowledge workforce, and magnitude of knowledge creation.
- **Creative Economy Size:** Measures the size of creative economy as reflected by cultural and creative services exports and creative outputs.
- **Firm Entry and Exit:** Measures the vitality of a local economy as reflected in the churn of firms and regulations that enable firm formation.

**INTELLECTUAL PROPERTY.** Intellectual property infringement is a major risk in international business. This node examines national commitments to intellectual property protection, including patents, copyrights and trademarks.

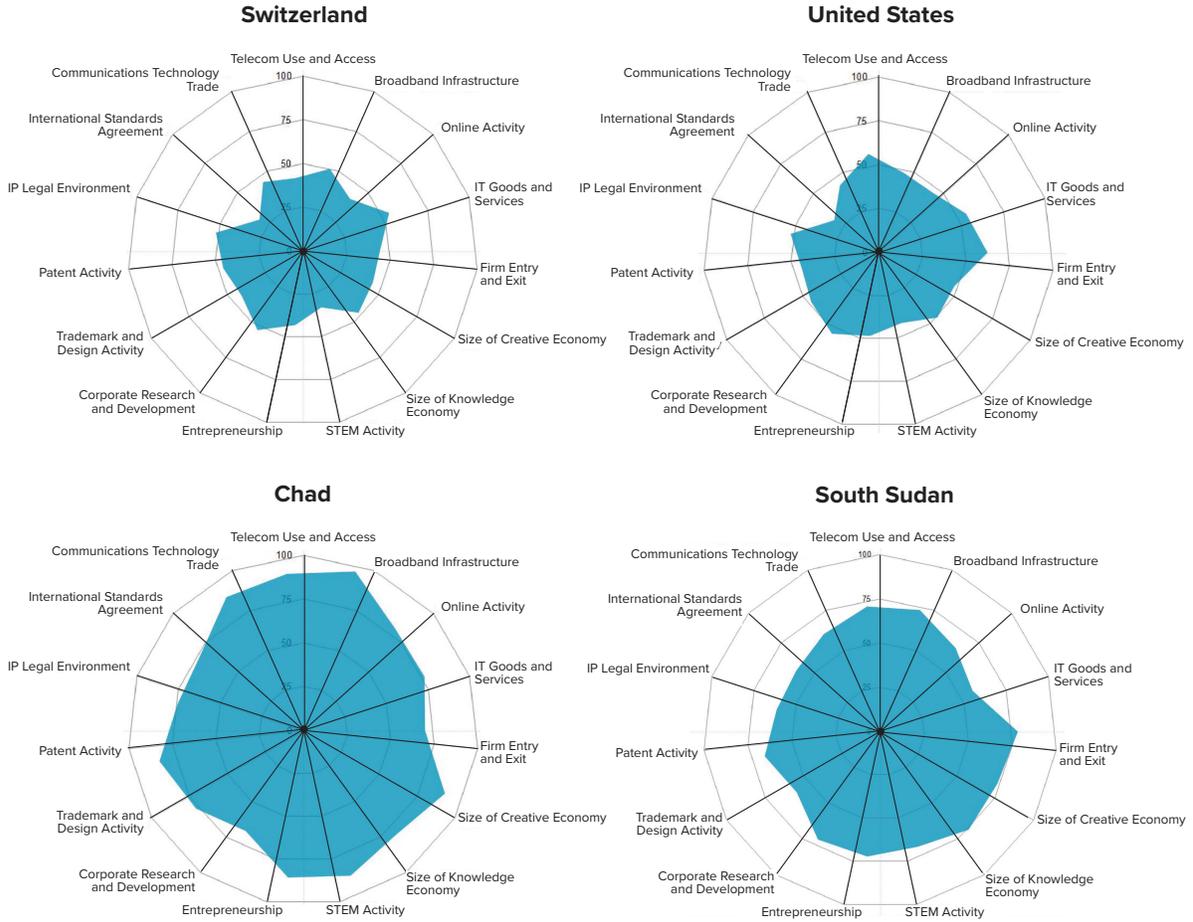
- **International Standards Agreement:** Describes national commitment to intellectual property protection as indicated by participation in international treaties.
- **IP Legal Environment:** Catalogs the extent to which the institutional and regulatory environment supports protection of intellectual property, including patents and copyright.
- **Patent Activity:** Measures the magnitude of patent activity by origin.
- **Trademark and Industrial Design Activity:** Describes the magnitude of trademarks and industrial design activity within a country.
- **Corporate R&D:** Describes private research and development activity and social support for private-sector knowledge creation as indicated by public-private research collaborations and other factors.

**SYSTEMS INTEGRITY.** Informational risks operate through digital infrastructure. This node assesses the robustness and security of national information architectures, including broadband and telecommunication infrastructure and security. The assessment of systems integrity is divided into the following factors:

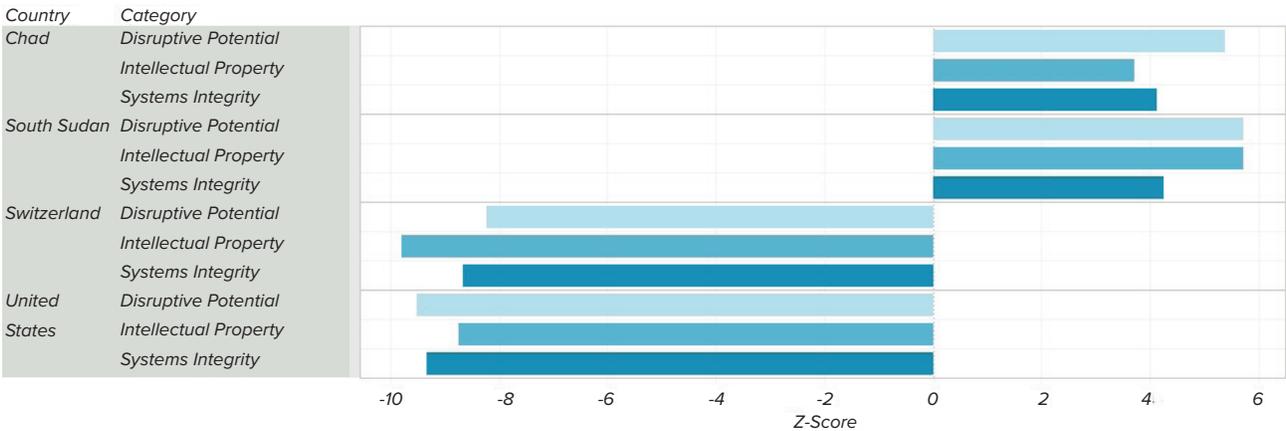
- **IT Goods and Services:** Describes IT sophistication through assessing the depth and quality of a nation’s computer hardware and software sectors.
- **Online Activity:** Broadly assesses the depth and sophistication of internet activity in private and public sectors.
- **Broadband Infrastructure:** Measures domestic network capacity and security.
- **Telecom Use and Access:** Describes the robustness of national telecommunications infrastructure, including fixed telephone lines and cellular, as well as information and communication technologies.
- **Communications Technology Trade:** Evaluates a country’s internal communications capacity based on the magnitude of information and communication technology exports and high-technology exports.



# Technology & Informational Risk for Switzerland, the U.S., Chad, and South Sudan



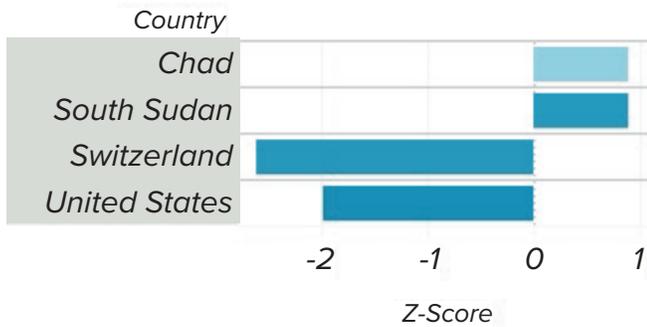
## Overall Technology & Informational Risk Comparison



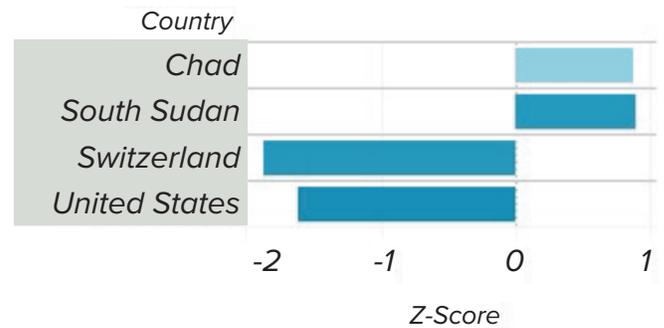
## Systems Integrity Risk

Informational risks operate through digital infrastructure. This node assesses the robustness and security of national information architectures, including broadband and telecommunication infrastructure and security. The assessment of systems integrity is divided into the following factors:

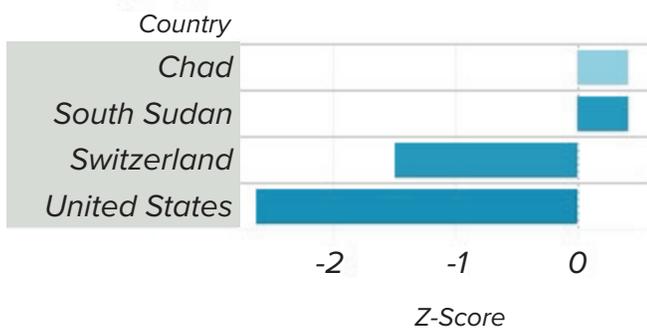
**Broadband Infrastructure:** Measures domestic network capacity and security.



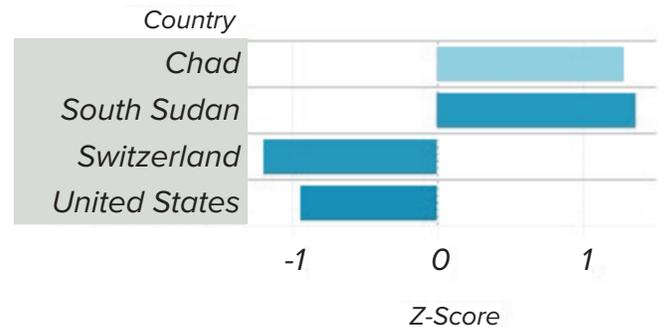
**Online Activity:** Broadly assesses the depth and sophistication of internet activity in private and public sectors.



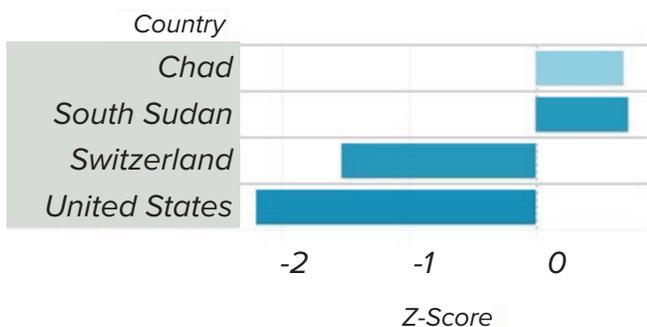
**Communications Technology Trade:** Evaluates a country's internal communications capacity based on the magnitude of information and communication technology exports and high-technology exports.



**Telecom Use and Access:** Describes the robustness of national telecommunications infrastructure, including fixed telephone lines and cellular, as well as information and communication technologies.



**IT Goods and Services:** Describes IT sophistication through assessing the depth and quality of a nation's computer hardware and software sectors.

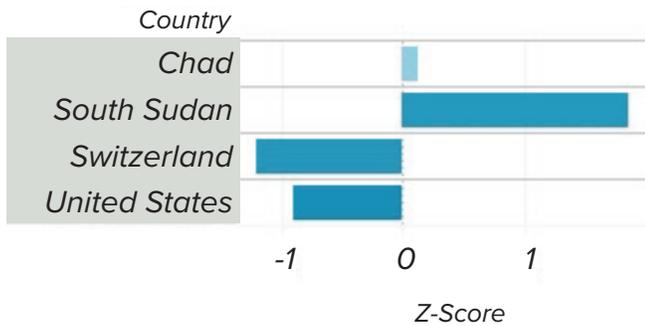


# Intellectual Property Risk

Intellectual property infringement is a major risk in international business. This node examines national commitments to intellectual property protection, including patents, copyrights and trademarks.

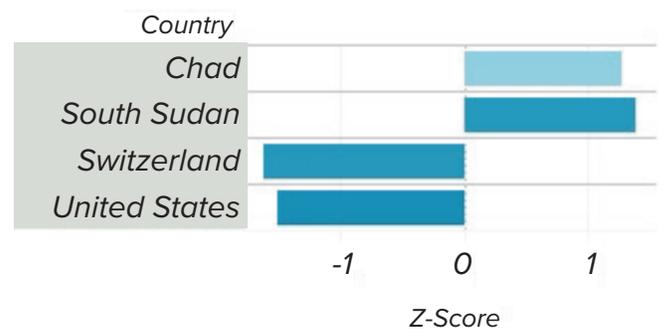
## International Standards Agreement:

Describes national commitment to intellectual property protection as indicated by participation in international treaties.

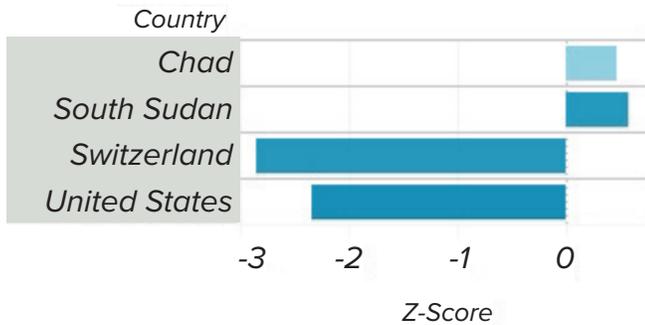


## IP Legal Environment:

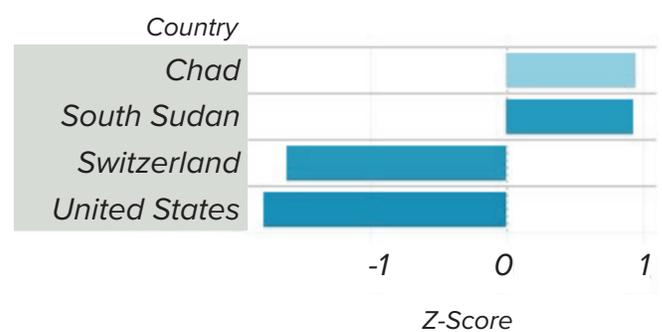
Catalogs the extent to which the institutional and regulatory environment supports protection of intellectual property, including patents and copyright.



**Patent Activity:** Measures the magnitude of patent activity by origin.

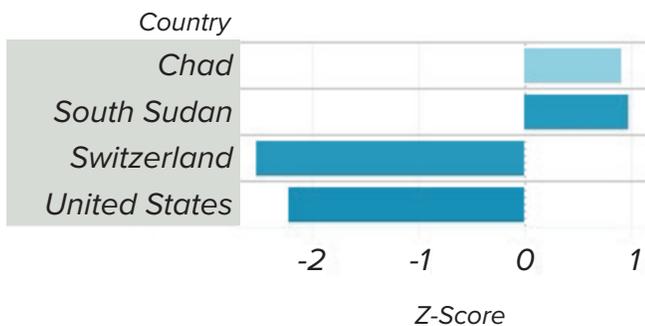


**Trademark and Design Activity:** Describes the magnitude of trademarks and industrial design activity within a country.



## Corporate Research and Development:

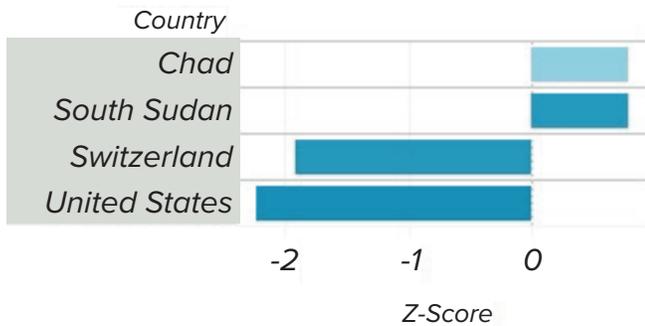
Describes private research and development activity and social support for private-sector knowledge creation as indicated by public-private research collaborations and other factors.



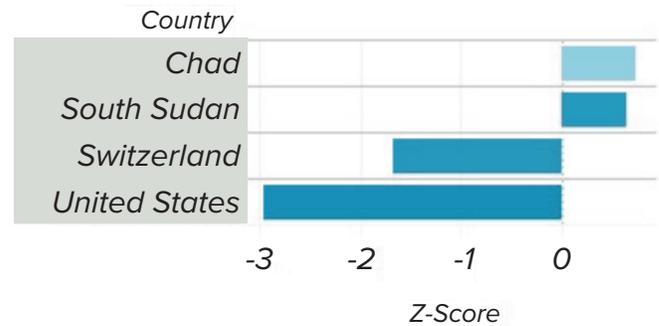
## Disruptive Potential Risk

Businesses thrive in dynamic climates, and economies thrive due to “creative destruction.” This node summarizes factors that foster entrepreneurialism, business creativity, and knowledge creation. It is divided into the following subnodes:

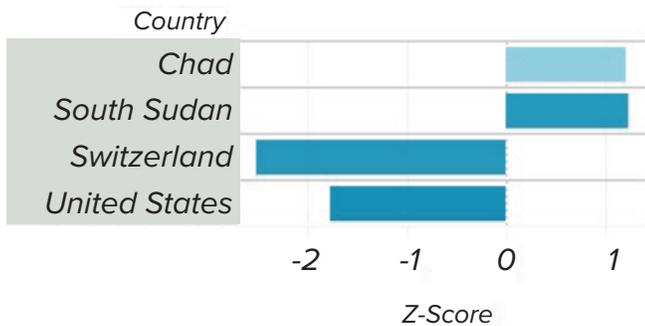
**STEM Activity:** Catalogs human capital and output in areas of Science, Technology, Engineering and Mathematics.



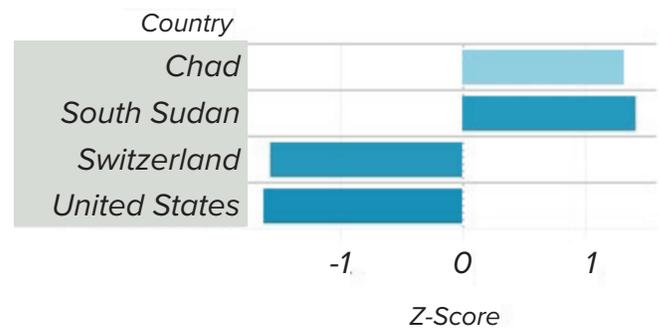
**Size of Creative Economy:** Measures the size of creative economy as reflected by cultural and creative services exports and creative outputs.



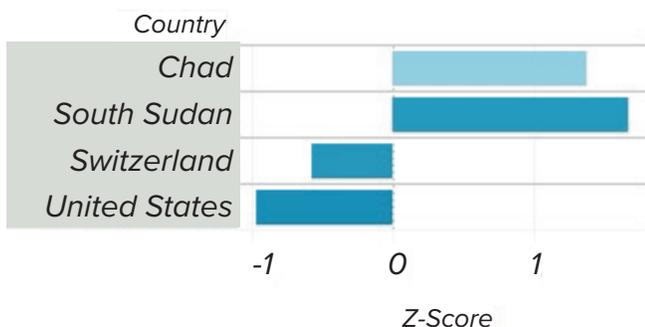
**Size of Knowledge Economy:** Measures the size of knowledge economy as reflected by size of knowledge-intensive sectors within the economy, size of knowledge workforce, and magnitude of knowledge creation.



**Entrepreneurship:** Assesses a nation’s startup culture and support for innovative business activity, including new business density, startup skills, and risk attitudes.



**Firm Entry and Exit:** Measures the vitality of a local economy as reflected in the churn of firms and regulations that enable firm formation.



**4**  
QUADRANT

## MARKET & ECONOMIC RISK OVERVIEW

**FISCAL AND REGULATORY RISK.** A nation's fiscal health and regulatory structure can directly impact business profitability. This node examines accompanying business risks built up from the following categories:

- **Taxation:** Catalogs corporate tax rate and other tax-related business costs.
- **Property Rights Protection:** Describes institutional indicators of property rights protection and risk of expropriation.
- **Business Friendliness:** Broadly measures friendliness of regulatory environment for business startup and operations, including ease of doing business and protection from informal sector competition.
- **Environmental Sustainability:** Describes the quality and effectiveness of environmental regulations.
- **Trade Openness:** Categorizes nations on the extent to which government rules and laws support low-cost access to international markets.

**MACROECONOMIC RISK.** Adverse macroeconomic conditions impact business profitability directly, through impact on economic performance, and indirectly, through impact on the relative value of local currency and the clearing of local labor markets. This node divides this category of risk into the following constituent pieces.

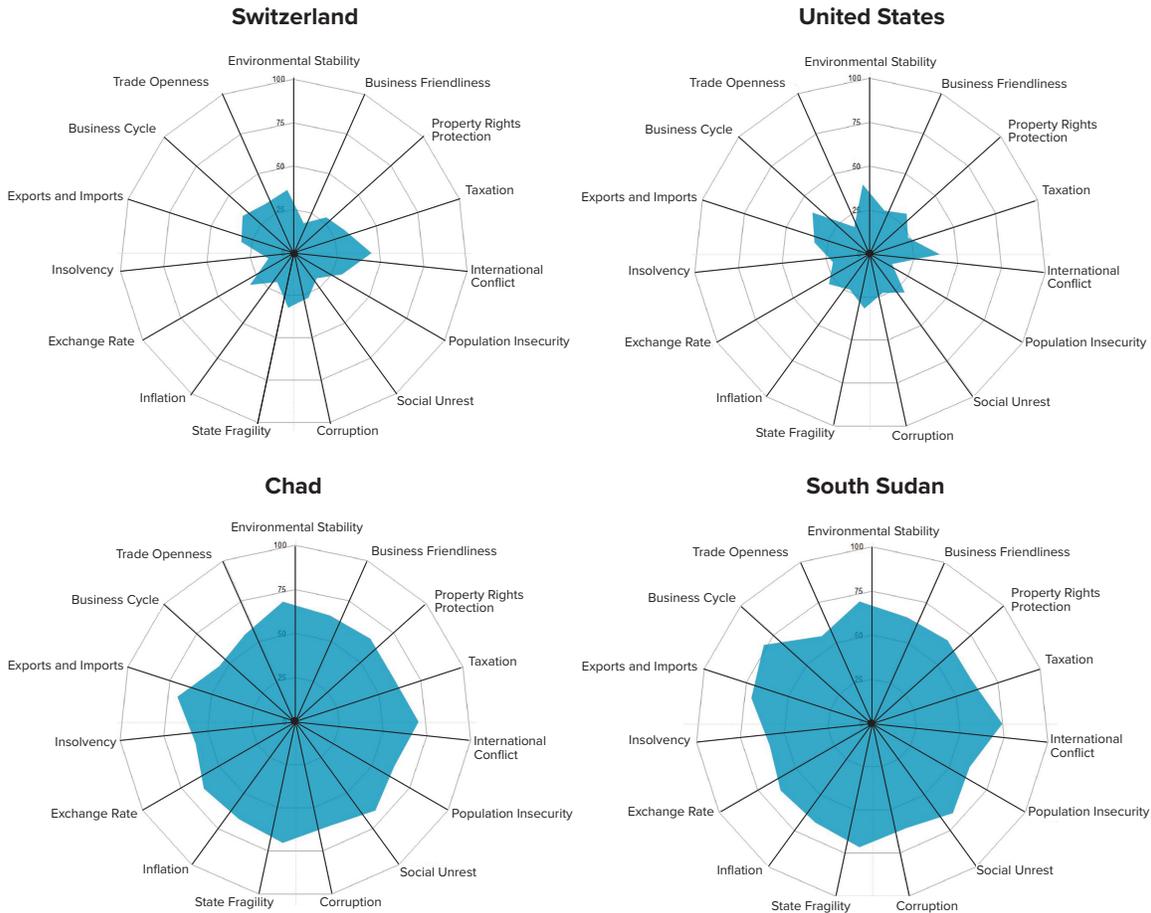
- **Business Cycle Risk:** Describes volatility of key macroeconomic indicators.
- **Exports and Imports:** Describes the magnitude of trade activities as well as domestic trade balance and current account balance.
- **Insolvency:** Examines the risk of government insolvency as indicated by credit information and markets for government bonds.
- **Exchange Rate Risk:** Tracks major fluctuations in currency per US dollar exchange rate either through intentional currency devaluation or currency crisis.
- **Inflation:** Assesses forward-looking indicators of inflationary risk.

**SOCIAL AND POLITICAL STABILITY.** Social and political stability are overarching preconditions for the efficient operation of markets and the protection of business profitability and firm assets over time. This node examines the following dimensions of social and political stability:

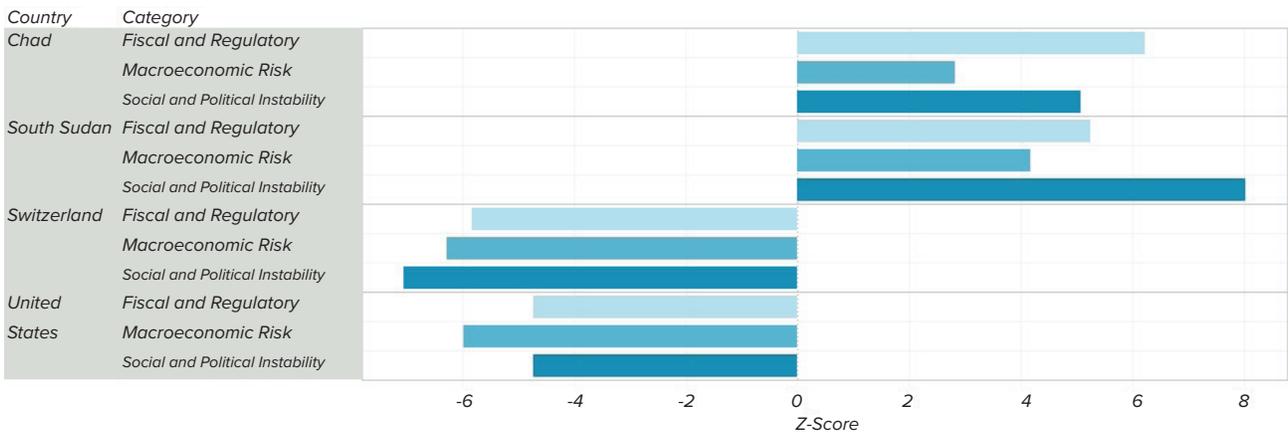
- **State Fragility:** Offers a broad assessment of capacity of domestic institutions to avoid catastrophic state failure.
- **Corruption:** Measures business costs attributable to institutional corruption.
- **Social Unrest:** Assesses the potential for violent insurrection as indicated by diverse measures that include group grievance, internal conflict, and historical incidence of civil violence.
- **Population Insecurity:** Measures the susceptibility of a population to civil unrest through diverse assessment of population insecurity that includes measures of poverty, demographic pressure, and food insecurity.
- **International Conflict:** Measures state involvement in international conflict, while also accounting for the degree of external intervention in domestic affairs and the extent of regional conflict.



# Market & Economic Risk for Switzerland, the U.S., Chad, and South Sudan



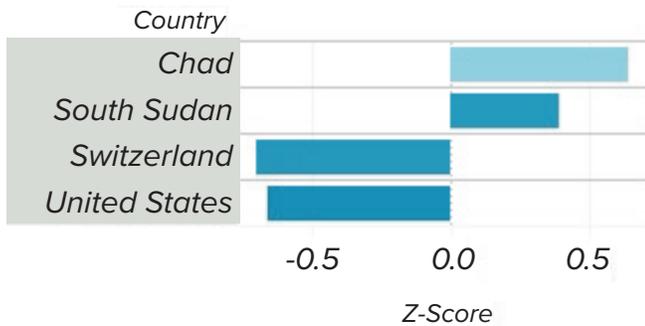
## Overall Market & Economic Risk Comparison



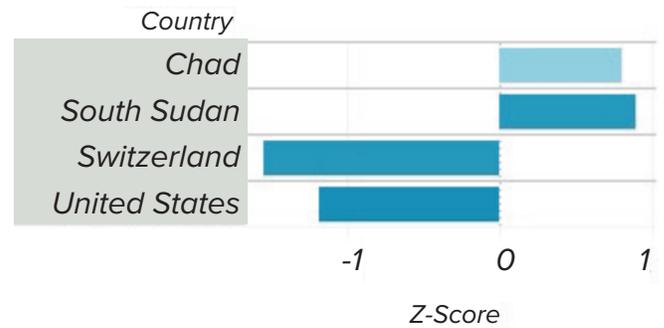
## Fiscal and Regulatory Risk

A nation's fiscal health and regulatory structure can directly impact business profitability. This node examines accompanying business risks built up from the following categories:

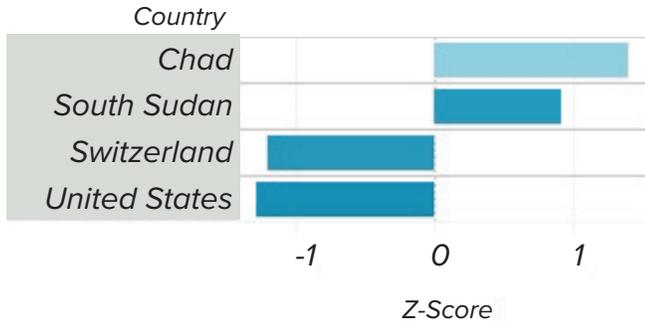
**Taxation:** Catalogs corporate tax rate and other tax-related business costs.



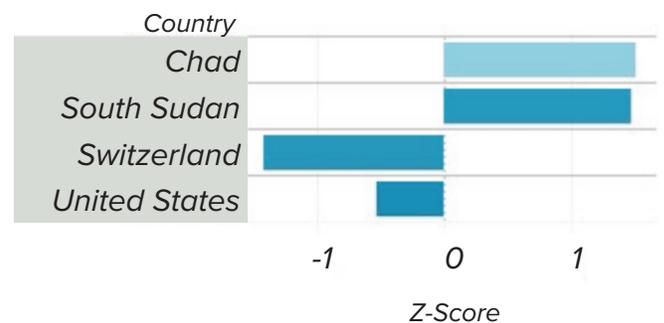
**Property Rights Protection:** Describes institutional indicators of property rights protection and risk of expropriation.



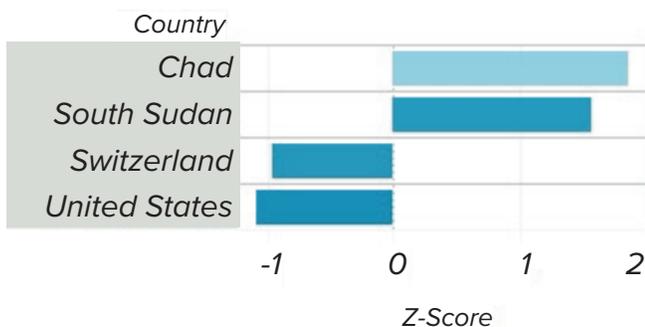
**Trade Openness:** Categorizes nations on the extent to which government rules and laws support low-cost access to international markets.



**Environmental Sustainability:** Describes the quality and effectiveness of environmental regulations.



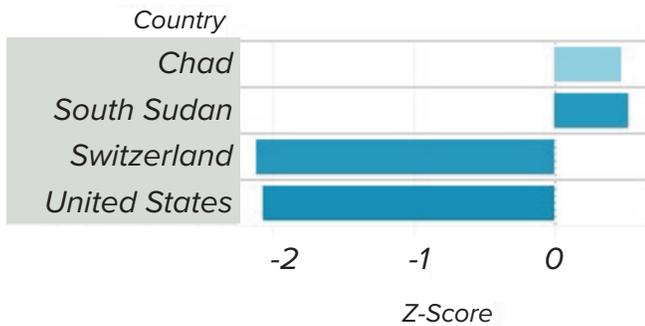
**Business Friendliness:** Broadly measures friendliness of regulatory environment for business startup and operations, including ease of doing business and protection from informal sector competition.



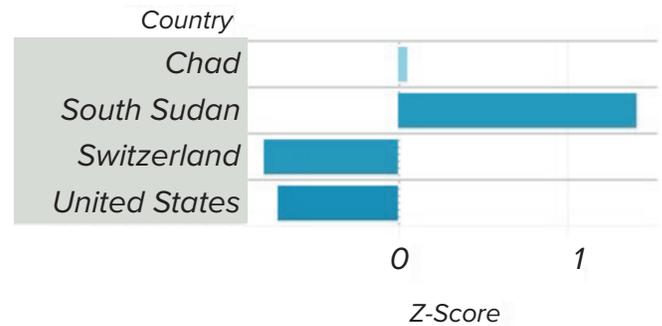
## Macroeconomic Risk

Adverse macroeconomic conditions impact business profitability directly, through impact on economic performance, and indirectly, through impact on the relative value of local currency and the clearing of local labor markets. This node divides this category of risk into the following constituent pieces.

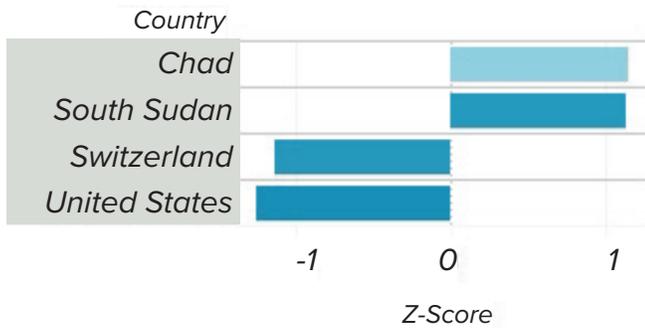
**Business Cycle:** Describes volatility of key macroeconomic indicators.



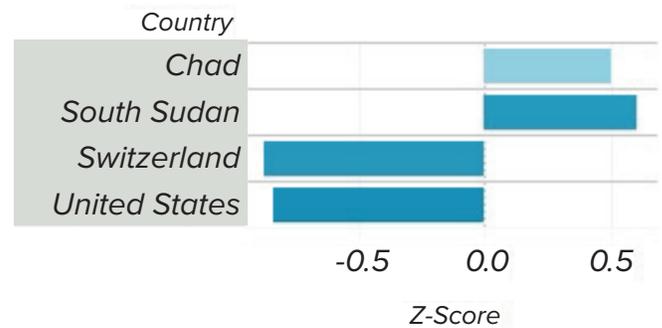
**Inflation:** Assesses forward-looking indicators of inflationary risk.



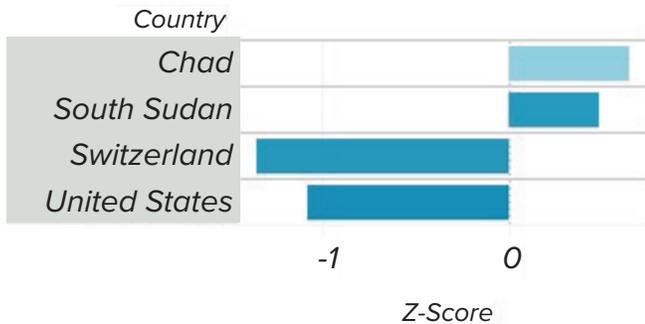
**Insolvency:** Examines the risk of government insolvency as indicated by credit information and markets for government bonds.



**Exports and Imports:** Describes the magnitude of trade activities as well as domestic trade balance and current account balance.



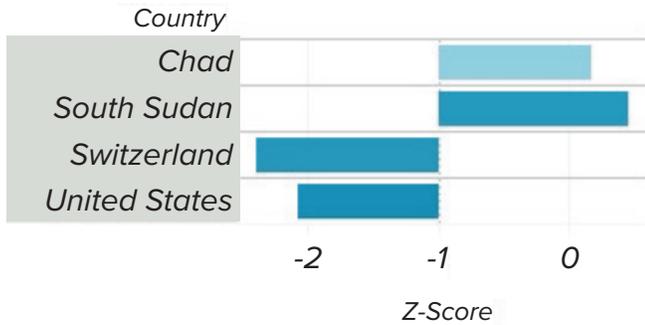
**Exchange Rate:** Tracks major fluctuations in currency per US dollar exchange rate, either through intentional currency devaluation or currency crisis.



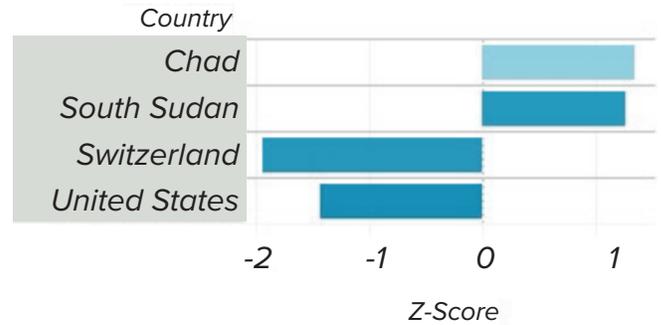
## Social and Political Instability Risk

Social and political stability are overarching preconditions for the efficient operation of markets and the protection of business profitability and firm assets over time. This node examines the following dimensions of social and political stability:

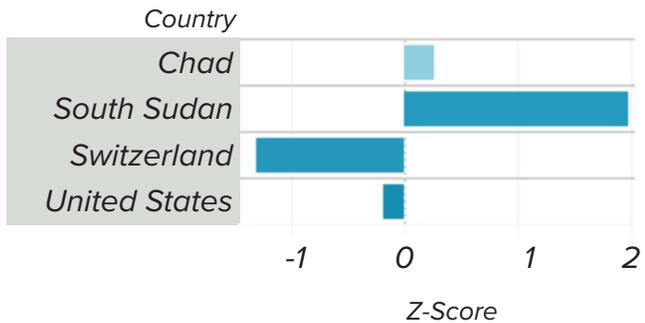
**State Fragility:** Offers a broad assessment of capacity of domestic institutions to avoid catastrophic state failure.



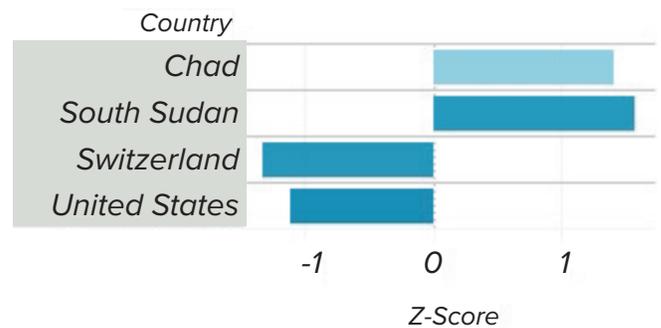
**Corruption:** Measures business costs attributable to institutional corruption.



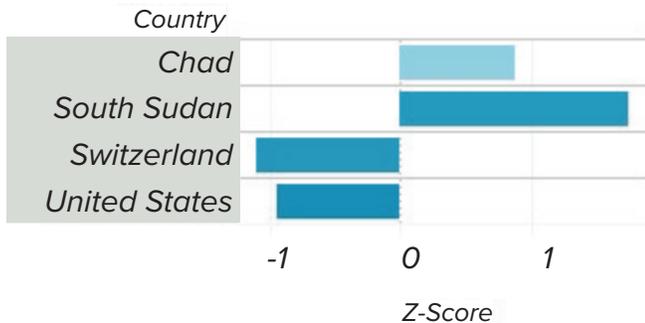
**International Conflict:** Measures state involvement in international conflict, while also accounting for the degree of external intervention in domestic affairs and the extent of regional conflict.



**Population Insecurity:** Measures the susceptibility of a population to civil unrest through diverse assessment of population insecurity that includes measures of poverty, demographic pressure, and food insecurity.



insurrection as indicated by diverse measures that include group grievance, internal conflict, and historical incidence of civil violence.

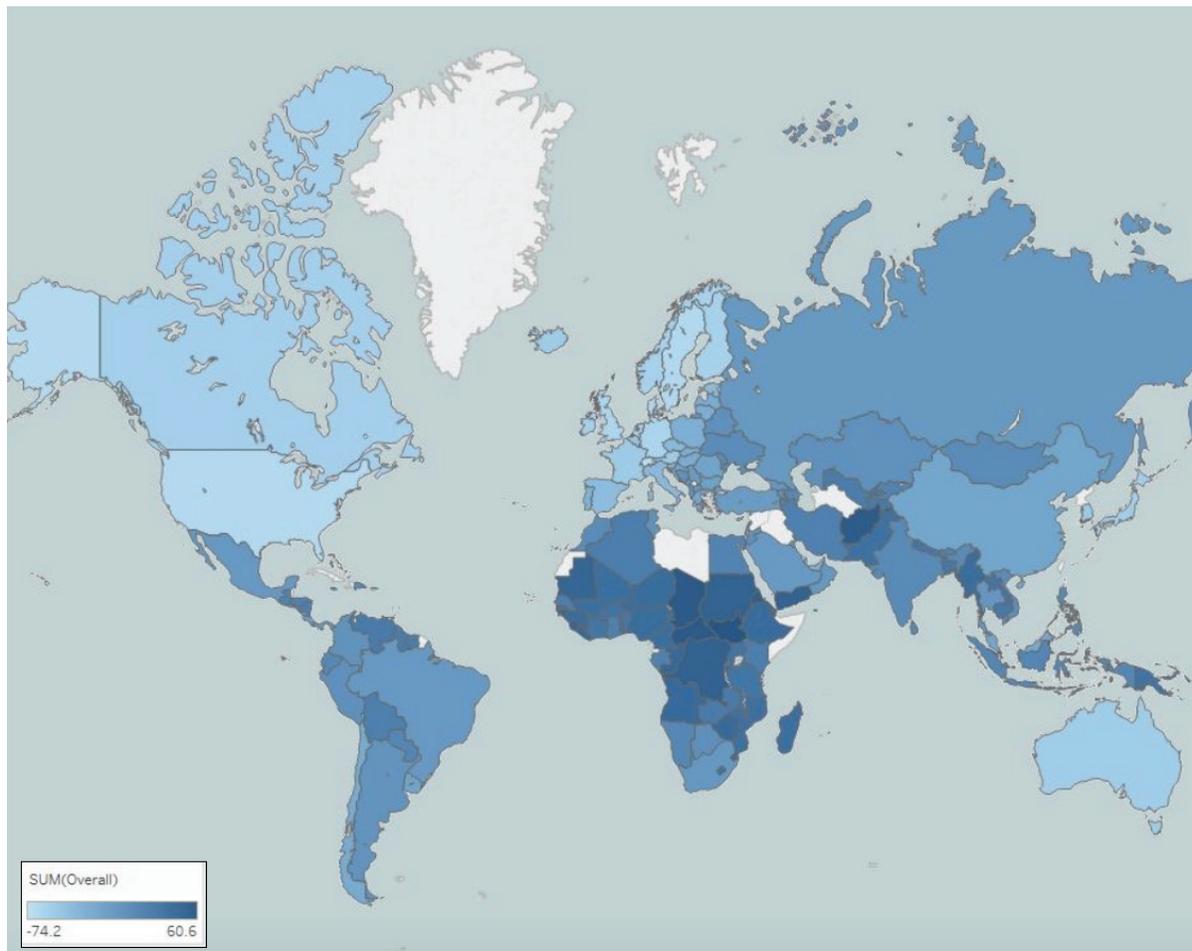


# 2017 GLOBAL RISK RANKINGS

## Overview

Taking all the factors (or subnodes) from all the quadrants of the PRW into account, the map below shows the relative overall risk for countries on a global scale.

Note: Risk is calculated based on the z-score methodology noted on page 6 and detailed in the Technical Appendix at the back of this document. In the map below, countries overall risk scores are portrayed by colors ranging from light blue (lower overall relative risk) to dark blue (higher overall relative risk).



## Global Risk Rankings

The following 25 tables provide overall risk rankings for the top 10 lowest risk countries for each country classification. Tables are provided for both overall risk rankings by income and for each of the four Pinkerton Risk Wheel quadrants as an aggregated score of each quadrant's sub-nodal factors.

- **Tables 1-5: Overall Risk** for the top 10 lowest risk countries with overall rankings and segmentation based on income
- **Tables 6-10: Hazard & Event Risk** for the top 10 lowest risk countries with overall rankings and segmentation based on income
- **Tables 11-15: Operational & Physical Risk** for the top 10 lowest risk countries with overall rankings and segmentation based on income
- **Tables 16-20: Technology & Informational Risk** for the top 10 lowest risk countries with overall rankings and segmentation based on income
- **Tables 21-25: Market & Economic Risk** for the top 10 lowest risk countries with overall rankings and segmentation based on income

RANK	COUNTRY	PERCENTILE
1	Switzerland	99
2	United States of America	99
3	Denmark	98
4	Sweden	98
5	Luxembourg	97
6	United Kingdom	96
7	Germany	96
8	Netherlands	95
9	Norway	95
10	Finland	94

RANK	COUNTRY	PERCENTILE
1	Switzerland	99
2	United States of America	99
3	Denmark	98
4	Sweden	98
5	Luxembourg	97
6	United Kingdom	96
7	Germany	96
8	Netherlands	95
9	Norway	95
10	Finland	94

RANK	COUNTRY	PERCENTILE
1	Lithuania	80
2	Latvia	77
3	Malaysia	76
4	Chile	76
5	China	74
6	Uruguay	73
7	Romania	73
8	Bulgaria	72
9	Costa Rica	71
10	Turkey	71

RANK	COUNTRY	PERCENTILE
1	Georgia	61
2	Armenia	58
3	Vietnam	53
4	Albania	53
5	Ukraine	52
6	Moldova	51
7	Morocco	50
8	India	49
9	Mongolia	49
10	Philippines	47

**TABLE 5**  
Overall Pinkerton Risk Index: Low Income Countries

RANK	COUNTRY	PERCENTILE
1	Kyrgyzstan	41
2	Rwanda	36
3	Kenya	32
4	Tajikistan	28
5	Nepal	26
6	Cambodia	26
7	Benin	25
8	Bangladesh	25
9	United Republic of Tanzania	23
10	Malawi	23

**TABLE 6**  
Hazard & Event Risk Index: All Countries

RANK	COUNTRY	PERCENTILE
1	Norway	99
2	Finland	99
3	Switzerland	98
4	Iceland	98
5	Sweden	97
6	Luxembourg	96
7	Canada	96
8	Austria	95
9	Denmark	95
10	Germany	94

**TABLE 7**  
Hazard & Event Risk Index: High Income Countries

RANK	COUNTRY	PERCENTILE
1	Norway	99
2	Finland	99
3	Switzerland	98
4	Iceland	98
5	Sweden	97
6	Luxembourg	96
7	Canada	96
8	Austria	95
9	Denmark	95
10	Germany	94

**TABLE 8**  
Hazard & Event Risk Index: Upper Middle Income Countries

RANK	COUNTRY	PERCENTILE
1	Uruguay	82
2	Lithuania	80
3	Costa Rica	77
4	Latvia	77
5	Romania	76
6	Chile	75
7	Malaysia	74
8	Republic of Serbia	73
9	Bulgaria	72
10	Montenegro	71

**TABLE 9**  
Hazard & Event Risk Index: Lower Middle Income Countries

RANK	COUNTRY	PERCENTILE
1	Georgia	69
2	Albania	66
3	Armenia	65
4	Bhutan	58
5	Paraguay	57
6	Cape Verde	56
7	Fiji	53
8	Federated States of Micronesia	51
9	Moldova	50
10	Sri Lanka	47

**TABLE 10**  
Hazard & Event Risk Index: Low Income Countries

RANK	COUNTRY	PERCENTILE
1	Kyrgyzstan	50
2	Rwanda	44
3	Malawi	28
4	Kenya	27
5	United Republic of Tanzania	26
6	Nepal	26
7	Tajikistan	25
8	Burkina Faso	25
9	Myanmar	24
10	Guinea	22

**TABLE 11**  
Operational & Physical Risk Index: All Countries

RANK	COUNTRY	PERCENTILE
1	United States of America	99
2	Denmark	99
3	Hong Kong S.A.R.	98
4	Switzerland	98
5	Singapore	97
6	Sweden	96
7	Luxembourg	96
8	Norway	95
9	Australia	95
10	Ireland	94

**TABLE 12**  
Operational & Physical Risk Index: High Income Countries

RANK	COUNTRY	PERCENTILE
1	United States of America	99
2	Denmark	99
3	Hong Kong S.A.R.	98
4	Switzerland	98
5	Singapore	97
6	Sweden	96
7	Luxembourg	96
8	Norway	95
9	Australia	95
10	Ireland	94

**TABLE 13**  
Operational & Physical Risk Index: Upper Middle Income Countries

RANK	COUNTRY	PERCENTILE
1	Lithuania	79
2	Chile	78
3	Latvia	77
4	Malaysia	74
5	China	74
6	Bulgaria	73
7	Romania	73
8	Turkey	72
9	Uruguay	71
10	South Africa	70

**TABLE 14**  
Operational & Physical Risk Index: Lower Middle Income Countries

RANK	COUNTRY	PERCENTILE
1	Ukraine	59
2	Georgia	58
3	India	56
4	Fiji	54
5	Sri Lanka	53
6	Samoa	52
7	Vietnam	50
8	Armenia	49
9	Mongolia	48
10	Indonesia	46

**TABLE 15**  
Operational & Physical Risk Index: Low Income Countries

RANK	COUNTRY	PERCENTILE
1	Kyrgyzstan	34
2	Bangladesh	33
3	Kenya	31
4	Cambodia	30
5	Rwanda	30
6	Tajikistan	26
7	Myanmar	25
8	Uganda	23
9	Togo	23
10	Nepal	22

**TABLE 16**  
Technology & Informational Risk Index: All Countries

RANK	COUNTRY	PERCENTILE
1	United States of America	99
2	Switzerland	99
3	United Kingdom	98
4	Germany	98
5	Netherlands	97
6	Sweden	96
7	South Korea	96
8	France	95
9	Denmark	95
10	Ireland	94

**TABLE 17****Technology & Informational Risk Index: High Income Countries**

RANK	COUNTRY	PERCENTILE
1	United States of America	99
2	Switzerland	99
3	United Kingdom	98
4	Germany	98
5	Netherlands	97
6	Sweden	96
7	South Korea	96
8	France	95
9	Denmark	95
10	Ireland	94

**TABLE 18****Technology & Informational Risk Index: Upper Middle Income Countries**

RANK	COUNTRY	PERCENTILE
1	China	85
2	Latvia	80
3	Russia	79
4	Lithuania	78
5	Malaysia	77
6	Chile	74
7	Romania	73
8	Turkey	72
9	Brazil	70
10	Uruguay	69

**TABLE 19****Technology & Informational Risk Index: Lower Middle Income Countries**

RANK	COUNTRY	PERCENTILE
1	India	68
2	Ukraine	65
3	Vietnam	62
4	Armenia	60
5	Moldova	59
6	Philippines	56
7	Georgia	54
8	Morocco	53
9	Mongolia	52
10	Egypt	48

**TABLE 20****Technology & Informational Risk Index: Low Income Countries**

RANK	COUNTRY	PERCENTILE
1	Kyrgyzstan	47
2	Kenya	42
3	Rwanda	40
4	Tajikistan	31
5	Mali	30
6	Benin	27
7	Malawi	25
8	Mozambique	24
9	United Republic of Tanzania	23
10	Uganda	23

**TABLE 21****Market & Economic Risk Index: All Countries**

RANK	COUNTRY	PERCENTILE
1	Switzerland	99
2	Hong Kong S.A.R.	99
3	Singapore	98
4	Sweden	98
5	Denmark	97
6	Norway	96
7	Luxembourg	96
8	Finland	95
9	Netherlands	95
10	United Kingdom	94

**TABLE 22****Market & Economic Risk Index: High Income Countries**

RANK	COUNTRY	PERCENTILE
1	Switzerland	99
2	Hong Kong S.A.R.	99
3	Singapore	98
4	Sweden	98
5	Denmark	97
6	Norway	96
7	Luxembourg	96
8	Finland	95
9	Netherlands	95
10	United Kingdom	94

**TABLE 23****Market & Economic Risk Index: Upper Middle Income Countries**

RANK	COUNTRY	PERCENTILE
1	Chile	80
2	Lithuania	79
3	Latvia	78
4	Malaysia	76
5	Romania	74
6	Uruguay	74
7	Mauritius	72
8	China	71
9	Bulgaria	70
10	Botswana	69

**TABLE 24****Market & Economic Risk Index: Lower Middle Income Countries**

RANK	COUNTRY	PERCENTILE
1	Georgia	66
2	Albania	60
3	Morocco	59
4	Armenia	58
5	Mongolia	55
6	Indonesia	52
7	El Salvador	51
8	Cape Verde	50
9	Philippines	49
10	Guatemala	47

**TABLE 25****Market & Economic Risk Index: Low Income Countries**

RANK	COUNTRY	PERCENTILE
1	Kyrgyzstan	36
2	Rwanda	34
3	Cambodia	32
4	Kenya	31
5	Benin	30
6	Tajikistan	30
7	Burkina Faso	26
8	Nepal	24
9	Togo	22
10	Mozambique	21

# TECHNICAL APPENDIX

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## Appendix 1: Imputation

To deal with missing values, we used a regression-based method called *multiple imputation through chained equations (MICE)*. The MICE method is a state-of-the-science strategy for addressing missing values (Rubin 1987). A regression model is fitted for each variable. For variable  $Y$  in countries  $j$  with a missing value, a model  $Y_j = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$  is fitted using cases with observed values on  $Y_j$  and predictors/covariates  $X_1, X_2, \dots, X_k$ . The fitted model includes parameter estimates  $\hat{\beta} = (\hat{\beta}_0, \hat{\beta}_1, \dots, \hat{\beta}_k)$  and the variance-covariance matrix  $(\hat{\sigma}_j^2 \mathbf{V}_j)$  of the estimates, where  $\mathbf{V}_j$  is the inverse matrix derived from the intercept and covariates  $X_1, X_2, \dots, X_k$ .

## Appendix 2: Min-Max Standardization

Min-max standardization is a method for rescaling the unit of measurement for given variable such that the minimum score for a variable is equal to zero and the maximum score is equal to one. Min-max standardization is computed by:  $(V - \max V) / (\max V - \min V)$ , where  $V$  represents the value on a variable for a given country. This method allows variables to have differing means and standard deviations but equal ranges.

## Appendix 3: Sample Standard Deviation and Z-Score

To understand the sample standard deviation (s) and z-score we detail steps and provide an example. The calculation of the sample standard deviation involves six steps:

- 1) Calculate the mean,  $\bar{X}$ , of a given variable across all countries;
- 2) Subtract the mean from the observed value,  $X_i$ , for each country ( $X_i - \bar{X}$ );
- 3) Square each mean subtraction ( $(X_i - \bar{X})^2$ );
- 4) Sum the squared mean subtractions  $\sum(X_i - \bar{X})^2$ ;
- 5) Divide the sum of squared mean subtractions by the sample size (n) minus 1 to get the *sample variance*  $\sum(X_i - \bar{X})^2 / n - 1$ ; and
- 6) Take the square root of the variance to arrive at the standard deviation:  $s = \sqrt{\sum(X_i - \bar{X})^2 / n - 1}$ .

The table below is subsample of 10 countries and their life expectancies at birth for 2013.

COUNTRY	LIFE EXPECTANCY	STEP 2: $X_i - \bar{X}$	STEP 3: $(X_i - \bar{X})^2$
Canada	81.40	6.87	47.21
Chile	81.20	6.67	44.46
Fiji	69.92	-4.61	21.27
Greece	80.63	6.10	37.26
Mongolia	69.06	-5.47	29.90
Netherlands	81.10	6.57	43.23
New Zealand	81.41	6.88	47.30
Romania	74.46	-0.07	0.00
South Africa	56.74	-17.79	316.61
Tajikistan	69.40	-5.13	26.31
n=10	Step 1: $\bar{X}=74.53$		Step 4: $\sum(X_i - \bar{X})^2 = 613.56$
			Step 5: $\sum(X_i - \bar{X})^2 / n - 1$ $= 613.56 / 10 - 1 = 68.17$
			Step 6: $s = \sqrt{\sum(X_i - \bar{X})^2 / n - 1}$ $= \sqrt{68.17} = 8.26$

With our standard deviation ( $s = 8.26$ ) calculated, we can calculate a z-score for each country,  $z = (X_i - \bar{X})/s$  allowing one to express in standardized terms how much and in what direction a country's life expectancy deviates from central tendency. Canada has a life expectancy at birth of 81.4 years. Expressed as a z-score, Canada's life expectancy is  $(81.4 - 74.53)/8.26 = 0.83$ , meaning that Canada's life expectancy is almost a full standard deviation above average.

## Appendix 4: Percentile

To visualize Pinkerton indices, we convert index z-scores to percentiles. The default formula for percentiles is as follows: Let  $x_{(j)}$  refer to variable  $x$  in ascending order for  $j = 1, 2, \dots, n$ . Let  $w_{(j)}$  refer to the corresponding weights of  $x_{(j)}$ ; if there are no weights,  $w_{(j)} = 1$ . Let  $N = \sum_{j=1}^n w_{(j)}$ . To obtain the  $p$ th percentile, which we will denote as  $x_{[p]}$ , let  $P = \frac{np}{100}$  and let  $W_{(i)} = \sum_{j=1}^i w_{(j)}$ . Find the first index,  $i$  such that  $W_{(i)} > P$ . The  $p$ th percentile is then

$$x_{[p]} = \begin{cases} \frac{x_{(i-1)} + x_{(i)}}{2} & \text{if } W_{(i-1)} = P \\ x_{(i)} & \text{otherwise} \end{cases}$$

## Appendix 5: Screening Variables for Inclusion

Variables appearing in indices were screened on the basis of correlation using economic and financial theory with statistical analysis. Pearson's correlation coefficient is a statistical summary of the linear association between two variables, having a value between +1 and -1, where +1 is a perfect positive association, 0 is no correlation (or independence), and -1 is a perfect negative association. A Pearson's correlation coefficient is calculated for each candidate variable ( $x_c$ ) to be included in risk index calculations by:

$$r_{bx} = \frac{n \sum x_1 b_1 - \sum x_1 \sum b_1}{\sqrt{n \sum x_1^2 - (\sum x_1)^2} \times \sqrt{n \sum b_1^2 - (\sum b_1)^2}}$$

Variables with a substantial correlation with  $b_c$  are included in risk indices. Economic theory and intuition is used to override algorithmic screening and signing of the variable input.



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## About Pinkerton

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