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# An inventory of Risk-related or Resilience-related Composite Indicators and Ratings

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# AN INVENTORY OF RISK-RELATED OR RESILIENCE-RELATED COMPOSITE INDICATORS AND RATINGS

The document presents an overview of some popular risk-related and resilience-related composite indicators and ratings that are currently available in the literature. The description of these indices is taken directly from the author or organization, that is, they are excerpts from websites and publications. The sources from which these excerpts were taken are clearly listed in each index entry.

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## 1. *ALTERNATIVE COUNTRY RISK RATING (IRPA)*

Developer 1	CLAES
Developer 2	D3E
Description of Main Dimensions (Weights in Parenthesis)	1. Economic 2. Social 3. Environment 4. Institutions 5. Technology. 12 indicators chosen: 1. Primary exports as a % of total goods exports 2. Debt service as a % of total exports of goods and services 3. Protected areas as a % of total country surface 4. Carbon dioxide emissions in metric tons per capita 5. Social expenditure as a % of GDP 6. Literacy rate 7. Household income distribution 8. Gross enrollment rate 9. Internet users 10. Political and civil liberties 11. Support for Democracy 12. % of undernourished (Equal weights)

<http://www.economiasur.com/publicaciones/OdeDBuonomoGudynasRPaisActualizado09.pdf>

The IRPA Index was constructed as an alternative to sovereign credit ratings and it expresses Latin American countries' vulnerabilities in the social, political, economic and environmental spheres. The index is based on 11 indicators: 1. Primary exports as a % of total goods exports 2. Debt service as a % of total exports of goods and services 3. Protected areas as a % of total country surface 4. Carbon dioxide emissions in metric tons per capita 5. Social expenditure as a % of GDP 6. Literacy rate 7. Household income distribution 8. Gross enrollment rate 9. Internet users 10. Political and civil liberties 11. Support for Democracy. 12. . % of undernourished (Added in 2009)

## 2. *COMPOSITE SCORE OF RISK (BRS)*

Developer 1	BERI
Description of Main Dimensions (Weights in Parenthesis)	1. Operations Risk Index (ORI), 2. Political Risk Index (PRI), 3. Remittance and Repatriation Factor (R-Factor).

<http://www.beri.com/brs.asp>

### 3. COUNTRY @RATINGS

Developer 1	COFACE
Description of Main Dimensions (Weights in Parenthesis)	1) Growth vulnerability 2) Foreign currency liquidity crisis 3) External over indebtedness 4) Sovereign financial vulnerability 5) Banking sector's fragilities 6) Fragility of governance and geopolitical environment 7) Companies' payment behaviour.

[http://www.coface.com/CofacePortal/COM\\_en\\_EN/pages/home/risks\\_home/country\\_risks](http://www.coface.com/CofacePortal/COM_en_EN/pages/home/risks_home/country_risks)

The Country @rating reflects the average level of short-term non-payment risk associated with companies in a particular country. It reflects the extent to which a country's economic, financial, and political outlook influences financial commitments of local companies. However, international trade actors know that sound companies can operate in risky countries and unsound companies in less-risky countries and that overall risk will depend not only on a company's qualities but also on those of the country in which it operates. Ratings are based on twofold expertise: macroeconomic expertise in assessing country risk based on a battery of macroeconomic financial and political indicators and microeconomic expertise that draws on Coface databases covering 50 million companies worldwide and 50 years experience with payment in trade flows it guarantees.

Country @ratings is calculated via a battery of indicators, grouped in seven families and rates each one individually. The seven risk families are: 1) Growth vulnerability 2) Foreign currency liquidity crisis 3) External over indebtedness 4) Sovereign financial vulnerability 5) Banking sector's fragilities 6) Fragility of governance and geopolitical environment 7) Companies' payment behaviour. Coface determines an overall rating for each of the 150 countries monitored. Like rating agencies, Coface ranks country ratings on seven risk levels.

#### 4. *COUNTRY RISK EVALUATION AND ASSESSMENT MODEL (CREAM)*

Developer 1 Exclusive Analysis

Description of Main

Dimensions (Weights in

Parenthesis) 1. War 2. Terrorism 3. Civil Unrest and 4. Political Risk

<http://www.exclusive-analysis.com/services/cream.html>

It forecasts violent and political risks, including war, terrorism, civil unrest and business risks.

The numbers on CREAM range from 0 to 10, and are designed to represent assessment of risks to assets and people. They are an aggregation of the incidents which are forecast to occur under each risk category in the various countries (combining the frequency and the scale of damage caused). There are four main categories of risk: 1. War 2. Terrorism 3. Civil Unrest and 4.

Political Risk For each country, these four categories are given numerical ratings on thirty day, one year and three year horizons. They are therefore predictive, and represent the average level of risk to assets and people over the time periods in question. The ratings are as follows:

3.2 and above Severe risk

2.4 to 3.1 High risk

1.6 to 2.3 Elevated risk

0.8 to 1.5 Caution

0 to 0.7 Low risk

#### 5. *COUNTRY RISK MONITORING SERVICE*

Developer 1 Political and Economic Risk Consultancy, Ltd. (PERC)

<http://asiarisk.com/>

It provides reports on the individual countries covered by their network that demonstrate how and why risk are changing in the country concerned and what companies should be watching for in the near and medium-term that could affect the business environment.

## 6. *DUCROIRE/DELCREDERE COUNTRY RISKS*

Developer 1

Ducroire/Delcredere

<http://www.ducroiredelcredere.be/WebDucDel/Website.nsf/weben/Country+risks?OpenDocument>

Ducroire | Delcredere makes quantitative and qualitative assessment of risks. The result of this analysis is, for each country and the various types of insured transactions, the setting of premium categories, country insurance ceilings and, if necessary, some particular terms of cover.

### 1. Premium categories for the insurance of export transactions

1.a. Political risk assessment

1.b. Commercial risk assessment

### 2. Cover capacity by country

### 3. Particular terms of cover

### 4. Market size indicators on [www.ondd.be](http://www.ondd.be)

## 7. *EIU COUNTRY RISK SERVICE (CRS)*

Developer 1

Economist Intelligence Unit (EIU)

Description of Main

Dimensions (Weights in

Parenthesis)

1. Broad categories of risk 2. Specific Investment risk

<http://store.eiu.com/product/730000273.html>

The purpose of the Country Risk Model (CRM) is to provide complete internationally comparable and regularly updated country risk scores for developing and highly indebted countries, and to generate credit ratings of the relative risks from a macroeconomic and financial standpoint. The risk ratings methodology examines risk from two distinct perspectives: 1) broad categories of risk grouped in analytical categories of political, economic policy, economic structure and liquidity factors; and 2) risk exposure associated with investing in particular types of financial instruments, namely specific investment risk. This includes risk associated with taking on foreign-exchange exposure against the US dollar, foreign-currency loans to sovereigns and foreign-currency loans to banks.



The CRM operates by asking the EIU's country expert to answer a series of quantitative and qualitative questions on recent and expected political and economic trends in the relevant country. Letter scores range from "A" (the lowest risk) to "E" (the highest risk). Overall scores are awarded in one-point increments, and can range from 0 ("A" category) to a maximum of 100 points ("E" category) for the highest-risk countries. These four types of general political and macroeconomic risk (political risk, economic policy risk, economic structure risk and liquidity risk) are assessed independently of their association with a particular investment vehicle. They are each given a letter grade. These factors are then used to compile an overall score and rating for the country. In terms of specific investment risk these break down as follows: Currency risk, Sovereign debt risk, Banking sector risk.

Ratings bands: The ratings bands of "A" to "E" as they pertain to political risk, economic policy risk, economic structure risk and liquidity risk are a convenient summary for translating the score obtained in the model into a letter category. For example, an "A" rating signifies the country is very strong in a particular category, and conversely an "E" underscores a severe weakness.

#### 8. *EMERGING MARKET BOND INDICES (EMBI)*

Developer 1

JP Morgan

<http://www.jpmorgan.com/pages/jpmorgan/investbk/solutions/research/EMBI>

The JP Morgan bond indices (EMBI, EMBI+, EMBI Global and EMBI Global Constrained) track total returns for traded external debt instruments in the emerging markets. Included in the EMBI Global, for example, are US dollar denominated Brady bonds, Eurobonds, traded loans and local market debt instrument issued by sovereigns classified as low or middle income by the World Bank and those countries that have restructured debt over the past 10 years. Moreover, instruments have to have face values of over US\$500 million with at least 2.5 years to maturity. Country sub-indices are used to evaluate country risk through their yield spreads (difference between country EMBI and US treasury yield).

## 9. EURO MONITOR RANKING

Developer 1	Lisbon Council
Developer 2	Allianz SE
Description of Main Dimensions (Weights in Parenthesis)	1. Fiscal sustainability 2. Competitiveness and domestic demand 3. Jobs, productivity and resource efficiency and 4. Private and foreign debt (equal weights amongst indicators)

<http://www.lisboncouncil.net/publication/publication/62-the-2010-euro-monitor.html>

The Euro Monitor is intended to be an annual macroeconomic scorecard that will evaluate EMU countries on their ability to achieve balanced macroeconomic growth, which, in turn, will allow the countries in question to deliver prosperity to their people and contribute to the strength and stability of the entire euro area. 15 quantitative indicators, which are themselves divided into four categories, compose the index: 1. Fiscal sustainability 2. Competitiveness and domestic demand 3. Jobs, productivity and resource efficiency and 4. Private and foreign debt.

A country's performance in these four areas is of critical importance in determining the trust that country will enjoy on financial markets and thus for the level of the risk premiums it will be demanded to pay by those markets. Financial markets are very precise in the way they make distinctions. Dodgy state finances are certainly more likely to be tolerated in the case of a country which enjoys high productivity and employment growth than in a country with a stalling economy.

All 15 individual indicators are quantitative indicators. Countries are given a rating score ranging from 1 to 10 in each of the 15 indicators. Since the individual indicators are assigned an equal weighting in the overall Euro Monitor rating score, the overall score for each country corresponds to the average rating of all 15 indicators, meaning that it is also expressed as a value from 1 to 10. The country rating in each category is calculated as the average of the indicator ratings in that category. Throughout, we have used annual values for all years until 2009 and estimates for 2010. We have defined three rating classes: values 1-4 (coded in the charts in red) signal poor performance, 5-7 (coded in dark blue) indicate middling performance and 8-10 (coded in light blue) good performance. Just as an alert threshold, values 1-4 can be seen as indicative values which guide the assessment but are to be complemented by economic judgment and country-specific expertise.



### 13. *GROWTH AND DEVELOPMENT BRIDGE (GDB) INDEX*

Developer 1	Anh-Nga Tran-Nguyen, Marwan Elkhoury and Philippe Brusick
Description of Main Dimensions (Weights in Parenthesis)	1) Capacity and resources; 2) infrastructure and institutional framework; 3) macroeconomic framework; 4) structural and global integration factors
<a href="http://www.gdbridge.org/gdb_index">http://www.gdbridge.org/gdb_index</a>	

GDB Index benchmarking is a tool to be used by policy makers for measuring performance and identifying potential for improvement, and by investors for making informed decisions on investment allocations and risk mitigation. The GDB Index can be used to benchmark and rate countries according to their economic fundamentals, to assess their strengths, weaknesses, opportunities and threats (SWOT), and to analyse their economic prospects. The GDB Index is derived from a solid model built on the findings of the vast literature on economic growth and development. The model has 38 measurable variables included in four categories of economic fundamentals (or economic pillars): 1) capacity and resources; 2) infrastructure and institutional framework; 3) macroeconomic framework; 4) structural and global integration factors. The GDB divides the world into five groups, based on their per capita GDP and GDP growth rates.

### 14. *INTERNATIONAL COUNTRY RISK GUIDE (ICRG) RATINGS - COMPOSITE RISK RATING*

Developer 1	PRS Group
Description of Main Dimensions (Weights in Parenthesis)	Political Risk index (100 points), Financial Risk (50 points) and Economic Risk (50 points)
<a href="https://www.prsgroup.com/ICRG.aspx">https://www.prsgroup.com/ICRG.aspx</a>	

The International Country Risk Guide (ICRG) rating comprises 22 variables in three subcategories of risk: political, financial, and economic. A separate index is created for each of the subcategories. The Political Risk index is based on 100 points, Financial Risk on 50 points, and Economic Risk on 50 points. The total points from the three indices are divided by two to produce the weights for inclusion in the composite country risk score. The composite scores,

ranging from zero to 100, are then broken into categories from Very Low Risk (80 to 100 points) to Very High Risk (zero to 49.9 points).

#### 15. *INWARD FDI POTENTIAL INDEX*

Developer 1	UNCTAD
Description of Main Dimensions (Weights in Parenthesis)	1. GDP per capita, 2. The rate of GDP growth over the previous 10 years 3. The share of exports in GDP 4, the average number of telephone lines per 1,000 inhabitants and mobile telephones per 1,000 inhabitants 5. Commercial energy use per capita to measure the availability of traditional infrastructure 6. The share of R&D spending in GDP 7. The share of tertiary students in the population 8. Country risk. 9. The world market share in exports of natural resources, 10. The world market share of imports of parts and components for automobiles and electronic products 11. The world market share of exports of services, 12. The share of world FDI inward stock

<http://www.unctad.org/templates/webflyer.asp?intitemid=2472&lang=1>

The Inward FDI Potential Index captures several factors (apart from market size) expected to affect an economy's attractiveness to foreign investors. It is an average of the values (normalized to yield a score between zero, for the lowest scoring country, to one, for the highest) of 12 variables (no weights are attached): 1. GDP per capita, an indicator of the sophistication and breadth of local demand (and of several other factors), with the expectation that higher income economies attract relatively more FDI geared to innovative and differentiated products and services 2. The rate of GDP growth over the previous 10 years, a proxy for expected economic growth. 3. The share of exports in GDP, to capture openness and competitiveness 4. As an indicator of modern information and communication infrastructure, the average number of telephone lines per 1,000 inhabitants and mobile telephones per 1,000 inhabitants 5. Commercial energy use per capita to measure the availability of traditional infrastructure 6. The share of R&D spending in GDP captures local technological capabilities 7. The share of tertiary students in the population, indicating the availability of high-level skills 8. Country risk, a composite indicator capturing some macroeconomic and other factors that affect the risk perception of investors.

The variable is measured in such a way that high values indicate less risk 9. The world market share in exports of natural resources, to proxy for the availability of resources for extractive FDI 10. The world market share of imports of parts and components for automobiles and electronic products, to capture participation in the leading TNC integrated production systems (WIR02) 11. The world market share of exports of services, to seize the importance of FDI in the services sector that accounts for some two thirds of world FDI 12. The share of world FDI inward stock, a broad indicator of the attractiveness and absorptive capacity for FDI, and the investment climate.

#### 16. MARKET POTENTIAL INDEX (MPI)

Developer 1	MSU-CIBER
Description of Main Dimensions (Weights in Parenthesis)	1. Market Size (10/50) 2. Market Growth Rate (6/50) 3. Market Intensity (7/50) 4. Market Consumption Capacity (5/50) 5. Commercial Infrastructure (7/50) 6. Economic Freedom (5/50) 7. Market Receptivity (6/50) and 8. Country Risk (4/50).

<http://globaledge.msu.edu/resourcedesk/mpi/>

The index aims to assist companies in comparing the Emerging Markets in terms of market potential. The index is constructed based on 8 dimensions encompassing 19 variables. These eight dimensions form, in turn, 8 sub-indices: 1. Market Size (variables: urban population and electricity consumption) with a weight of 10/50 2. Market Growth Rate (variables: Average annual growth rate of commercial energy use between years 1996-2001 and Real GDP growth rate (%)) with a weight of 6/50 3. Market Intensity (variables include GNI per capita estimates using PPP (US Dollars) and Private consumption as a percentage of GDP (%)) with a weight of 7/50 4. Market Consumption Capacity (Percentage share of middle-class in consumption/income) with a weight of 5/50 5. Commercial Infrastructure (variables include Telephone mainlines (per 100 habitants), Cellular mobile subscribers (per 100 habitants), Number of PC's (per 100 habitants), Paved road density (km per million people), Internet hosts (per million people), Population per retail outlet, Television sets (per 1000 persons)) with weight of 7/50 6. Economic Freedom (variables include Economic Freedom Index by Heritage Foundation Political Freedom Index by Freedom House) with weight of 5/50 7. Market Receptivity (variables Per capita imports from US (US Dollars) and Trade as a percentage of GDP (%)) with weight of 6/20 and 8. Country Risk (Country risk rating by Euromoney) with

weight of 4/50. The index is based on a scale of 0-100 and countries are ranked from highest market potential (the maximum being 100) to lowest (the minimum being 0).

#### 17. *QUALITATIVE RISK MEASURE IN FOREIGN LENDING (QLM-FE)*

Developer 1	BERI
Description of Main Dimensions (Weights in Parenthesis)	Level of resolve toward honoring international obligations 3.0, Foreign loan structure and terms: 3.0, Corruption in financial transactions: 3.5, Concessionary loans and grants: 3.0, Net technocratic competence: 4.0, Legal framework: 3.5

<http://www.beri.com/qlm.asp>

It measures factors that have a direct influence on meeting international obligations but that cannot be assessed through regularly published statistics. The 11 criteria listed below have a weighted total of 20. Each criterion is rated from 5 (best case) to zero (worst case). Therefore, a perfect country would receive a score of 100 (20 x 5).

	<i>Weighting</i>
Level of resolve toward honoring international obligations	3.0
Foreign loan structure and terms:	
Range, concessionary to short term	2.0
Current market terms	1.0
Corruption in financial transactions:	
Direct fraud	2.0
Indirect diversion of funds	1.5
Concessionary loans and grants:	
Level of access	1.5
Influence of strategic importance	1.5
Net technocratic competence:	
Overall assessment	2.5
Political interference	1.5
Legal framework:	
Convertibility for principal, interest, fees	2.0
Taxation constraints	1.5

## 18. SOVEREIGN CREDIT RATING (BY FITCHIBCA DUFF&PHELPS)

Developer 1

FitchIBCA Duff&Phelps

[http://www.fitchratings.com/index\\_fitchratings.cfm](http://www.fitchratings.com/index_fitchratings.cfm)

(The methodology can be accessed in the US Department of State website or the Fitch website – login required): ratings are based on a series of analysis of data. Questionnaires are sent to relevant officials seeking information about indebtedness and debt servicing capacity. A series of interviews are conducted where policy is assessed together with the tradable sector, the country's sensitivity to shocks and availability to absorb them, an assessment of political risk as well as a set of orthodox indicators (such as the ratio of debt to exports and the like). Subject areas covered are the following: i. Demographic, educational and structural factors ii Labor market analysis iii Structure of output and trade iv. Dynamism of the private sector v. Balance of supply and demand vi. Balance of payments vii. Analysis of medium-term growth constraints viii. Macroeconomic policy ix. Trade and foreign investment policy x. Banking and finance xi. External assets xii. External liabilities xiii. Politics and the state xiv. International position. Countries are assigned a short term and a medium/long term rating. One key factor in assigning the short term rating is the country's official foreign reserve holding compared to imports. Other factors are taken into account as well, such as export earnings volatility or high level of overseas short term investments. The ratings assigned to countries are as follows:

### *Long-Term Credit Ratings*

#### Investment Grade

AAA Highest credit quality. 'AAA' ratings denote the lowest expectation of credit risk. They are assigned only in case of exceptionally strong capacity for timely payment of financial commitments. This capacity is highly unlikely to be adversely affected by foreseeable events.

AA Very high credit quality. 'AA' ratings denote a very low expectation of credit risk. They indicate very strong capacity for timely payment of financial commitments. This capacity is not significantly vulnerable to foreseeable events.

A High credit quality. 'A' ratings denote a low expectation of credit risk. The capacity for timely payment of financial commitments is considered strong. This capacity may, nevertheless, be more vulnerable to changes in circumstances or in economic conditions than is the case for higher ratings.

BBB Good credit quality. 'BBB' ratings indicate that there is currently a low expectation of credit risk. The capacity for timely payment of financial commitments is considered adequate, but



adverse changes in circumstances and in economic conditions are more likely to impair this capacity. This is the lowest investment-grade category.

### Speculative Grade

BB Speculative. 'BB' ratings indicate that there is a possibility of credit risk developing, particularly as the result of adverse economic change over time; however, business or financial alternatives may be available to allow financial commitments to be met. Securities rated in this category are not investment grade.

B Highly Speculative. 'B' ratings indicate that significant credit risk is present, but a limited margin of safety remains. Financial commitments are currently being met; however, capacity for continued payment is contingent upon a sustained, favorable business and economic environment.

CCC, CC, C High default risk. Default is a real possibility. Capacity for meeting financial commitments is solely reliant upon sustained, favorable business or economic developments. A 'CC' rating indicates that default of some kind appears probable. 'C' ratings signal imminent default.

DDD, DD, and D Default. The ratings of obligations in this category are based on their prospects for achieving partial or full recovery in a reorganization or liquidation of the obligor. While expected recovery values are highly speculative and cannot be estimated with any precisions, the following serve as general guidelines. 'DDD' obligations have the highest potential for recovery, around 90%-100% of outstanding amounts and accrued interest. 'DD' indicates potential recoveries in the range of 50%-90% and 'D' the lowest recovery potential, i.e. below 50%.

### *Short-Term Credit Ratings*

F1 Highest credit quality. Indicates the strongest capacity for timely payment of financial commitments; may have an added "+" to denote any exceptionally strong credit feature.

F2 Good credit quality. A satisfactory capacity for timely payment of financial commitments, but the margin of safety is not as great as in the case of the higher ratings.

F3 Fair credit quality. The capacity for timely payment of financial commitments is adequate; however, near-term adverse changes could result in a reduction to non-investment grade.

B Speculative. Minimal capacity for timely payment of financial commitments, plus vulnerability to near-term adverse changes in financial and economic conditions.

C High default risk. Default is a real possibility. Capacity for meeting financial commitments is solely reliant upon a sustained, favorable business and economic environment.

D Default. Denotes actual or imminent payment default.

19. *SOVEREIGN CREDIT RATING (BY STANDARD AND POOR'S)*

Developer 1

Standard and Poor's

<http://www.standardandpoors.com/ratings/sovereigns/ratings-list/en/us/?sectorName=Governments&subSectorCode=39&subSectorName=Sovereigns>

Sovereign credit ratings reflect S&P's opinions on the ability and willingness of sovereign governments to service their commercial financial obligations in full and on time. A rating is a forward-looking estimate of default probability. Standard & Poor's appraisal is both quantitative and qualitative. Standard & Poor's divides the analytical framework for sovereigns into 10 categories and each sovereign is ranked on a scale of one (the best) to six for each of the 10 analytical categories. There is no exact formula for combining the scores to determine ratings. The analytical variables are interrelated and the weights are not fixed, either across sovereigns or over time. Most categories incorporate both economic and political risk, the key determinants of credit risk. Economic risk addresses the government's ability to repay its obligations on time and is a function of both quantitative and qualitative factors. Political risk addresses the sovereign's willingness to repay debt. The 100 sovereigns Standard & Poor's monitors carry ratings between 'AAA' and 'SD' (Selective Default).

## 20. STATE TECHNOLOGY AND SCIENCE INDEX

Developer 1	Milken Institute
Description of Main Dimensions (Weights in Parenthesis)	1. Research and development inputs 2. Risk capital and entrepreneurial infrastructure 3. Human capital investment 4. Technology and science workforce 5. Technology concentration and dynamism

<http://www.milkeninstitute.org/publications/publications.taf?function=indexes>

The State Technology and Science Index looks at the ecosystem of economic development and sustainability, such as a State's research and development capabilities, entrepreneurial capacity and risk capital infrastructure, human capital, and the intensity of its technology and science workforce, and gauges the technology and science assets that can be leveraged to promote economic development. The five pillars are: 1. Research and development inputs 2. Risk capital and entrepreneurial infrastructure 3. Human capital investment 4. Technology and science workforce 5. Technology concentration and dynamism.

## 21. CLIMATE CHANGE VULNERABILITY INDEX (CCVI) AND CLIMATE CHANGE RISK ATLAS

Developer 1	Maplecroft
Description of Main Dimensions (Weights in Parenthesis)	1. Exposure to climate related disasters 2. human sensitivity 3. Future Vulnerability

[http://www.maplecroft.com/about/news/climate\\_change\\_risk\\_list\\_highlights\\_vulnerable\\_nations\\_and\\_safe\\_havens\\_05.html](http://www.maplecroft.com/about/news/climate_change_risk_list_highlights_vulnerable_nations_and_safe_havens_05.html)

The Climate Change Vulnerability Index (CCVI) enables organizations to identify areas of risk within their operations, supply chains and investments. It evaluates 42 social, economic and environmental factors to assess national vulnerabilities across three core areas. These include: exposure to climate-related natural disasters and sea-level rise; human sensitivity, in terms of population patterns, development, natural resources, agricultural dependency and conflicts; thirdly, the index assesses future vulnerability by considering the adaptive capacity of a country's government and infrastructure to combat climate change.

## 22. CLIMATE COMPETITIVENESS INDEX (CCI)

Developer 1 UNEP

Description of Main

Dimensions (Weights in Parenthesis) 1. Climate Accountability Index 2. Climate Performance Index (equally weighted)

[http://www.climatecompetitiveness.org/images/CCI\\_Download\\_Main\\_Report\\_PDF/cci-exec-summary.pdf](http://www.climatecompetitiveness.org/images/CCI_Download_Main_Report_PDF/cci-exec-summary.pdf)

The Climate Competitiveness Index is a new analysis of how countries create enduring economic value through low carbon technology, products and services. The 2010 Climate Competitiveness Index assesses climate accountability and performance to identify how 95 countries are progressing towards the low carbon economy. CCI is the largest data-set and largest country-sample index to have been developed in the climate competitiveness space. It is a dynamic index with two components:

1. The Climate Accountability Index includes 13 variables examining the degree to which a country has the leadership, institutions, systems and practices in place to deliver climate competitiveness. So in addition to government actors, it considers the role of business associations, investment promotion agencies and consumer groups. The Climate Accountability Index is drawn from national disclosures, gathered by a multilingual team of trained analysts using a checklist of over 150 parameters.
2. The Climate Performance Index pulls together a broad range of national-level climate indicators, containing 13 hard and soft climate-related datasets from IEA, WEF, Gallup, Swiss RE and AccountAbility. Performance covers price signals, energy networks, carbon management by businesses and the decarbonisation track record to date. Countries that combine high performance on both dimensions are considered best placed to thrive in the low carbon economy.

The Climate Performance Index combines equally weighted sub-themes to analyse incentives and price signals, awareness and risk management, access to clean electricity and intensity emissions trends. The results show a mild positive correlation between accountability and performance in 95 countries. The mean of the two sub-indexes can be taken as the Climate Competitiveness Index.

### 23. ENVIRONMENTAL VULNERABILITY INDEX (EVI)

Developer 1	SOPAC
Description of Main	1.Climate Change = CC 2. Biodiversity = CBD 3.
Dimensions (Weights in	Water = W 4. Agriculture and fisheries = AF 5. Human
Parenthesis)	health aspects = HH 6.Desertification = CCD 7.
	Exposure to Natural disasters = D

<http://vulnerabilityindex.net/Files/EVI%20Final%20Report%202005.pdf>

The EVI is based on 50 indicators for estimating the vulnerability of the environment of a country to future shocks. These indicators are combined by simple averaging and reported simultaneously as a single index, a range of policy-relevant thematic sub-indices and as a profile showing the results for each indicator. Simple averages across indicators were used because they can be easily understood and more complex models do not appear to offer any advantages to the expression or utility of the index.

There are three distinct aspects of vulnerability recognisable for environmental, economic and social aspects of countries, all of which need to be evaluated to provide an overall sense of the issues at play. These are the risks associated with hazards, resistance and acquired vulnerability (damage). The first aspect relates to the likelihood of hazards coming into play, while the latter two aspects are related to the ability of the environment to withstand the effects of hazards. In the EVI, indicators were specifically selected to ensure that information on these three aspects is incorporated in the overall vulnerability of countries. There are 32 indicators of hazards, 8 of resistance and 10 that measure damage. The hazard indicators relate to the frequency and intensity of hazardous events. The resistance indicators refer to the inherent characteristics of a country that would tend to make it more or less able to cope with natural and anthropogenic hazards. Damage indicators relate to the vulnerability that has been acquired through loss of ecological integrity or increasing levels of degradation of ecosystems. For most indicators, signals are based on average levels observed over the past 5 years, but may include data for much longer periods for geological events. All of the EVI's indicators are transformed to a common scale so that they can be combined by averaging, and to facilitate the setting of thresholds of vulnerability. This new scale has been designed to reflect the environmental vulnerability associated with each indicator, regardless of any other scale on which an indicator could simultaneously exist. The EVI scale was defined as ranging between a value of 1 (indicating high resilience / low vulnerability) and 7 (indicating low resilience / high vulnerability). The EVI scale

was determined separately for each indicator, is designed to be policy-levant, and is based on the best available scientific information.

Each indicator is classified into a range of sub-indices including the three aspects of hazards; resistance and damage and into policy-relevant sub-indices including: Climate Change = CC , Biodiversity = CBD, Water = W, Agriculture and fisheries = AF, Human health aspects = HH, Desertification = CCD, Exposure to Natural disasters = D. EVI reports for countries are organised as a single-page, information-dense report card. The information available on the report includes overall EVI score in points, with percent of data over which it was calculated and a classification of overall vulnerability. Vulnerability classification:

Extremely vulnerable 365+

Highly Vulnerable 315+

Vulnerable 265+

At risk 215+

Resilient < 215

The EVI is unlike other environmental indices that describe the relative position of a country in relation to worldwide observed values. The EVI has been designed using thresholds which have been built in to the 1-7 EVI scale to create a link or anchor between what conditions are observed in countries and those that are environmentally sustainable. Using this approach, indicators are scaled independently of the observed values, providing an in-built mechanism by which countries can immediately assess their vulnerability, rather than identifying their position in relation to others.

#### 24. GLOBAL CLIMATE CHANGE POLICY TRACKER

Developer 1	Deutsche Bank
Description of Main Dimensions (Weights in Parenthesis)	1.Incentives 2. Public Financing 3. Enforcement 4. Monitoring 5. Sovereign credit risk 6. Integrated plan 7. Implementation capacity 8. Historical Achievement
	<a href="http://www.dbcca.com/dbcca/EN/investment-research/investment_research_1780.jsp">http://www.dbcca.com/dbcca/EN/investment-research/investment_research_1780.jsp</a>

This Global Climate Change Policy Tracker provides investors with an analysis of climate change policies and assigns a risk rating to 109 countries, states and regions based on key government mandates and supporting policy frameworks. It incorporates results of a model prepared by Columbia Climate Center researchers that estimates the impacts on carbon emissions of each of 270 major climate policies, and aggregates them at country, regional and global levels. The "Climate Tracker" provides a risk rating of countries and regions based on their relative attractiveness to investors. It is designed to help investors identify the best risk-adjusted returns in climate change investment opportunities around the world.

From this database we have:

1. Analyzed each mandated target to assess its risk level and ability to deliver its goal;
2. Developed an investor risk assessment of country policy regimes by aggregating these individual mandates;
3. Modeled the impact of all the targets on emissions through 2020. The modeling was conducted by researchers at the Columbia Climate Center at Columbia University's Earth Institute.

We have developed a robust, qualitative assessment framework to rate each target, which is in turn fed into a quantitative risk rating score. Each target is assessed against 8 key criteria, which are then used collectively to develop a composite risk rating. As already discussed, incentives are particularly important. Given the importance of these, we use five sub-criteria to assess them. While these evaluations are qualitative in nature, we have attempted to be as methodical as possible in our assessment.

*8 criteria:* 1.Incentives 2. Public Financing 3. Enforcement 4. Monitoring 5. Sovereign credit risk 6. Integrated plan 7. Implementation capacity 8. Historical Achievement

In the overall assessment, each of the criteria has been given equal weighting. This results in a composite score of between 8 and 24 points, with lower scores indicating a relatively lower-risk policy environment:

- For all targets with a score of 12 points or less, the composite score is 1 – lower risk;
- for all targets with a score of between 13 and 20, the composite score is 2 – moderate risk;
- and for all targets with a score of 21 and above, the composite score is 3 – higher risk.

We have developed a view of the most attractive geographies for investment, based on the strength of the policy regime in place. Where multiple targets are rated in a single geography, we have weighted their ratings (based on the emissions impact) for the average rating for the region.

## 25. GLOBAL CLIMATE RISK INDEX (CRI)

Developer 1	Germanwatch
Description of Main Dimensions (Weights in Parenthesis)	1. Number of deaths, 2. Number of deaths per 100 000 inhabitants, 3. Sum of losses in US\$ in purchasing power parity (PPP) as well as 4. Losses per unit of Gross Domestic Product (GDP).

<http://www.germanwatch.org/klima/cri.htm>

The Global Climate Risk Index (CRI) analyses the quantified impacts of extreme weather events<sup>2</sup> - both in terms of fatalities as well as economic losses that occurred - based on data from Munich Re NatCatSERVICE which is worldwide one of the most reliable and complete data bases on this matter. The CRI looks both at absolute and relative impacts, and results in an average ranking of countries in four indicators, with a stronger weighting of the relative indicators. The countries ranking highest are the ones most impacted and should see the CRI as a “warning signal” that they are at risk either from frequent events or rare, but extraordinary catastrophes.

The Climate Risk Index does not provide an all-encompassing analysis of the risks from anthropogenic climate change to countries, but should be seen as one analysis informing countries’ exposure and vulnerability to climate-related risks along with other analyses, based on the most reliable quantified data.

Analysed indicators: For this examination the following indicators were analysed in this paper: 1. Number of deaths, 2. Number of deaths per 100 000 inhabitants, 3. Sum of losses in US\$ in purchasing power parity (PPP) as well as 4. Losses per unit of Gross Domestic Product (GDP).



For the indicators 2. to 4., economic and population data primarily by the International Monetary Fund was taken into account. However, it has to be added that especially for small (e.g. Pacific small island states) or politically extremely instable countries (e.g. Somalia), the required data is not always available in sufficient quality for the whole observed time period. Those countries have to be left out of the analyses.

## 26. SUSTAINABILITY RATING

Developer 1

Zurich Cantonal Bank (ZKB)

[http://www.zkb.ch/etc/ml/repository/textdokumente/english/corporate/kurzfassung\\_nachhaltigkeitsrating\\_2009\\_en.pdf](http://www.zkb.ch/etc/ml/repository/textdokumente/english/corporate/kurzfassung_nachhaltigkeitsrating_2009_en.pdf).File.pdf

The sustainability ratings intend to fill a gap left by traditional credit ratings, which include only minimal information on the environmental situation and on social factors. For many investors, a key factor when deciding to make a sustainable investment is the conviction that in the end sustainable business practices pay off, since risks can be recognized at an early stage and new opportunities can be exploited. Both natural resources and stable political and social conditions are key preconditions for a healthy economy. The evaluation of sustainability is based on 100 largely quantitative, but in part also qualitative, environmental and social aspects. Environmental and social aspects each receive a 50 % weighting in the rating. The sustainability rating is based on a scale of 1 to 10 points and is calculated using the arithmetic mean of the environmental and social ratings. The sub-areas include the following: 1) Environment: energy, water, resources, greenhouse effect, air quality, biodiversity, mobility and environmental policy 2) Social Area: security and stability, human rights, standard of living, health, education and culture, progress, equality, international commitments, In each area, the country with the poorest performance receives 1 point and that with the best performance 10 points.

## 27. EIU POLITICAL INSTABILITY INDEX

Developer 1	Economist Intelligence Unit (EIU)
Description of Main Dimensions (Weights in Parenthesis)	1. Index of underlying vulnerability and 2. an economic distress index (simple average of both)
<a href="http://viewswire.eiu.com/site_info.asp?info_name=social_unrest_table&amp;page=no_ads&amp;rf=0">http://viewswire.eiu.com/site_info.asp?info_name=social_unrest_table&amp;page=no_ads&amp;rf=0</a>	

The Political Instability Index shows the level of threat posed to governments by social protest. The index scores are derived by combining measures of economic distress and underlying vulnerability to unrest. The final PITF model that had the greatest predictive power is a simple model that is based on only four factors: the level of development as measured by the infant mortality rate; extreme cases of economic or political discrimination against minorities (according to assessments and codings by the Minorities at Risk Project); "a bad neighbourhood" (if a country has at least four neighbours that suffered violent conflicts); and regime type (intermediate regimes that are neither consolidated democracies nor autocratic regimes combined with the existence in these regimes of intense factionalism in domestic politics, as coded by the Polity Project on democracy). Although over 80% of outbreaks of instability could be predicted (a very high "hit rate"), the model cannot predict the intensity or duration of the instability, or its exact timing. We also look and measure other factors associated with instability that have been identified in the literature, such as inequality, a prior history of instability, ethnic fragmentation, poor governance, a proclivity to labour unrest, the level of provision of public services and state strength.

We define social and political unrest or upheaval as those events or developments that pose a serious extra-parliamentary or extra-institutional threat to governments or the existing political order. The events will almost invariably be accompanied by some violence as well as public disorder. These need not necessarily be successful in the sense that they end up toppling a government or regime. Even unsuccessful episodes result in turmoil and serious disruption. The assessment of what constitutes a "serious threat" still requires judgment and can be arbitrary, but this is a step forward from having no definition at all.

The overall index on a scale of 0 (no vulnerability) to 10 (highest vulnerability) has two component indexes—an index of underlying vulnerability and an economic distress index. The overall index is a simple average of the two component indexes. There are 15 indicators in all—12 for the underlying vulnerability and 3 for the economic distress index.

I. Underlying vulnerability: 1. Inequality 2. State history 3. Corruption 4. Ethnic fragmentation 5. Trust in institutions 6. Status of minorities 7. History of political instability 8. Proclivity to labour unrest 9. Level of social provision 10. A country's neighbourhood 11. Regime type 12. Regime type and factionalism

II. Economic distress: 1. Growth in incomes 2. Unemployment 3. Level of income per head  
In the compilation of the economic distress sub-index, growth in GDP per head and unemployment have weights of 40% each, and GDP per head has a weight of 20%.

## 28. *GLOBAL POLITICAL RISK INDEX (GPRI)*

Developer 1	Eurasia Group
Description of Main Dimensions (Weights in Parenthesis)	Four equally weighted subcategories: government, society, security, and economy.

<http://blogs.reuters.com/andrew-marshall/files/2010/08/GPRI.pdf>

The GPRI is an index of country stability ratings for 24 emerging market countries. Its unique methodology measures a country's ability to absorb political shocks. The GPRI evaluates political, social, economic, and security factors, using a combination of quantitative and qualitative data that is collected on the ground and through open source methods. Ratings are expressed on a scale of 0 to 100. Clear and concise analysis accompanies the index to illustrate what events impacted each country's stability rating and make forecasts for the coming month. Each country's score is based on 20 indicators in four equally weighted subcategories: government, society, security, and economy.

## 29. *HUMAN RIGHTS RISK ATLAS*

Developer 1	Maplecroft
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[http://www.maplecroft.com/portfolio/human\\_rights/atlas/](http://www.maplecroft.com/portfolio/human_rights/atlas/)

The Human Rights Risk Atlas 2011 includes interactive maps and indices for 30 human rights categories and scorecards for 196 countries. It also features sub-national mapping of human rights violations and human security incidents down to site-specific levels worldwide. It is supported by sector specific country human rights risk reports.

### 30. PEACE AND CONFLICT INSTABILITY LEDGER

	Center for International Development and Conflict Management
Developer 1	Management
Description of Main Dimensions (Weights in Parenthesis)	1. Regime consistency 2. Economic openness 3. Infant mortality rates 4. Militarization 5. Neighborhood security (no weights)
	<a href="http://www.cidcm.umd.edu/pc/">http://www.cidcm.umd.edu/pc/</a>

It is a ranking of countries in terms of their risk of future state instability. The risk estimate for each country was obtained using a statistical model based on several variables known to be strongly related to the onset of instability events (or armed civil conflict). These include the incoherence of the governing regime, high infant mortality rates, lack of integration with the global economy, the militarization of society, and the presence of armed conflict in neighboring states. For each country, the ledger presents a single score that captures the overall risk of future instability. In addition, the ledger gives information about the level of statistical confidence corresponding to the risk estimate. The analysis draws from four domains, identifying five factors that are closely related to the onset of political instability. 1- From the political domain, the ledger accounts for the impact of *institutional consistency*. Regimes lacking institutional consistency—possessing a mix of both democratic and autocratic features—are more likely to experience instability. 2- The ledger accounts for the impact of the economic domain by accounting for *economic openness*, which is the extent to which a country's economy is integrated with the global economy. Countries that are more tightly connected to global markets have been found to experience less instability. 3- For the social domain, the ledger examines the impact of *infant mortality rates*, an indicator that serves as a proxy for a country's overall economic development and the level of advancement in social welfare policy. 4- To account for the security domain, the ledger focuses on a country's *level of militarization* and *neighborhood security*. Instability is most likely in countries with higher levels of militarization. Also, the likelihood of instability increases substantially when a neighboring state is currently experiencing armed conflict. For each country, the ledger presents an array of information about the risks of future instability. The score for each country's likelihood of future instability is presented as a *risk ratio*. The risk ratio gives the relative risk of instability in a country compared to the average estimated likelihood of instability for 28 member countries of the Organization for Economic Cooperation and Development (OECD). For example, Guatemala's score of 7.3 should be interpreted as

meaning that the risk of instability in that country is more than seven times greater than the average country in the OECD. Countries with scores in the top 25th percentile are categorized as high risk (denoted with a red circle in the ledger). Countries with scores falling below the global median are denoted as low risk (denoted with a green circle). The remaining countries are classified as moderate risk (denoted with a gold circle). Finally, the ledger reports a confidence range for every country's estimate. Statistically speaking, the "true" risk of instability lies within this range with a 95 percent probability.

### 31. *POLITICAL AND ECONOMIC RISK MAP*

Developer 1

AON

Developer 2

Oxford Analytica

<http://www.oxan.com/About/Media/News/AONRiskMap2010.aspx>

It rates the economic and political risks in more than 200 territories worldwide, and includes a table of key supply chain disruption events and threats, and a list of 2006's most significant global stress points. Political, economic and social environments can shift at a moment's notice, disrupting business operations for anyone involved in international commerce. Companies can be subjected to discriminatory action – or inaction – of foreign governments and third parties, potentially leading to forced shutdowns, relocations and other unforeseen expenses. It classifies countries into low risk, medium-low risk, medium risk, medium-high risk and high risk.

### 32. *POLITICAL RISK ATLAS*

Developer 1

Maplecroft

[http://www.maplecroft.com/portfolio/political\\_risk/atlas/](http://www.maplecroft.com/portfolio/political_risk/atlas/)

The Atlas offers 41 indices and maps, as well as scorecards for each country, sub-national mapping of terrorism and conflict, plus two years of trends.

### 33. GLOBAL BURDEN OF DISEASE (GBD)

Developer 1	WHO
Description of Main Dimensions (Weights in Parenthesis)	1. Childhood and maternal under nutrition: Underweight, Iron deficiency, Vitamin A deficiency, Zinc deficiency, Suboptimal breastfeeding, 2. Other nutrition-related risk factors and physical activity: High blood pressure, High cholesterol, High blood glucose, Overweight and obesity, Low fruit and vegetable intake, Physical inactivity 3. Addictive substances: Tobacco use, Alcohol use, Illicit drug use, 4. Sexual and reproductive health, Unsafe sex, Unmet contraceptive need 5. Environmental risks: Unsafe water, sanitation, hygiene, Urban outdoor air pollution , Indoor smoke from solid fuels, Lead exposure, Global climate change, 6. Occupational risks: Risk factors for injuries, Carcinogens, Airborne particulates, Ergonomic stressors, Noise 7. Other selected risks: Unsafe health-care injections, Child sexual abuse

[http://www.who.int/topics/global\\_burden\\_of\\_disease/en/](http://www.who.int/topics/global_burden_of_disease/en/)

The global burden of disease (GBD) measures burden of disease using the disability-adjusted life year (DALY). This time-based measure combines years of life lost due to premature mortality and years of life lost due to time lived in states of less than full health. The DALY metric assesses the burden of disease consistently across diseases, risk factors and regions. The principle guiding the burden of disease approach is that the best estimates of incidence, prevalence, and mortality can be generated by carefully analyzing all available sources of information in a country or region, and correcting for bias. The disability-adjusted life year (DALY), a time-based measure that combined years of life lost due to premature mortality and years of life lost due to time lived in health states less than ideal health, was developed to assess the burden of disease.

DALYs are a common currency by which deaths at different ages and disability may be measured. One DALY can be thought of as one lost year of “healthy” life, and the burden of disease can be thought of as a measurement of the gap between current health status and an ideal situation where everyone lives into old age, free of disease and disability. DALYs for a disease or injury are calculated as the sum of the years of life lost due to premature mortality (YLL) in the population and the years lost due to disability (YLD) for incident cases of the

disease or injury. YLL are calculated from the number of deaths at each age multiplied by a global standard life expectancy of the age at which death occurs. YLD for a particular cause in a particular time period are estimated as follows:

YLD = number of incident cases in that period × average duration of the disease × disability weight

The disability weight reflects the severity of the disease on a scale from 0 (perfect health) to 1 (death). In the standard DALYs in recent WHO reports, calculations of YLD used an additional 3% time discounting and non-uniform age weights that give less weight to years lived at young and older ages. Using discounting and age weights, a death in infancy corresponds to 33 DALYs, and deaths at ages 5–20 years to around 36 DALYs.

### 34. REPRODUCTIVE RISK INDEX

Developer 1	Population Action International
Description of Main Dimensions (Weights in Parenthesis)	1. adolescent fertility 2. contraceptive prevalence 3. antenatal care 4. skilled attendance at delivery 5. anemia among pregnant women 6. HIV/AIDS prevalence among adult females 7. HIV/AIDS prevalence among adult males 8. abortion policy 9. L Lifetime risk of death from Pregnancy and Childbirth (total fertility rate (TFR), and maternal mortality ratio (MMR))
<a href="http://www.populationaction.org/Publications/Reports/A_World_of_Difference/Trends_in_Reproductive_Health_Worldwide.shtml">http://www.populationaction.org/Publications/Reports/A_World_of_Difference/Trends_in_Reproductive_Health_Worldwide.shtml</a>	

The index is composed of 10 indicators of reproductive health. The ten indicators of reproductive health composing the Reproductive Risk Index are: adolescent fertility, contraceptive prevalence, antenatal care, skilled attendance at delivery, anemia among pregnant women, HIV/AIDS prevalence among adult females, HIV/AIDS prevalence among adult males, abortion policy, total fertility rate (TFR), and maternal mortality ratio (MMR).

Reproductive Risk Index combines TFR and MMR into the indicator Lifetime Risk of Death from Pregnancy and Childbirth (LTR) to which a logarithmic function is applied. LTR indicates the risk associated with each pregnancy and the number of times a woman becomes pregnant.

The observed range for seven of the resulting nine indicators is then transformed into a range of 0 to 100. For each of these seven indicators, each country is located in the new range, giving the country at the top of the range for each indicator a score of 100 and the country at the bottom of the range a score of zero. For the construction of the Reproductive Risk Index, LTR is given

a weight of two to reflect the importance of the two indicators from which it is derived. The final composite index score is derived by dividing the sum of the eight-scaled values and the two assigned scores by 10. The maximum value of the index a country can have is 95 because the maximum scores assigned to prevalence of anemia and abortion policies are 70 and 80 respectively.

### 35. *FAMINE EARLY WARNING SYSTEM (FEWSNET)*

Developer 1	USAID, Chemonics International, Inc., United States Geological Survey (USGS), National Aeronautics and Space Administration (NASA), National Oceanographic and Atmospheric Administration (NOAA), United States Department of Agriculture (USDA)
Description of Main Dimensions (Weights in Parenthesis)	Crude mortality rate (# deaths per 10,000 people per day), Acute malnutrition (weight/height $\lt - 2 z$ -scores), Food access/ availability, Coping, Livelihood assets (5 capitals: human, social, financial, natural, physical)
	<a href="http://www.fews.net/Pages/default.aspx">http://www.fews.net/Pages/default.aspx</a>

The primary purpose of the FEWS NET Food Insecurity Severity Scale is to provide a common classification of the severity of food insecurity, which can be used to highlight priority areas and populations in need of emergency response that have been identified based on food security analysis. Achieving statistically comparable measures of food insecurity is not currently possible, even with a major investment – nor necessarily required for early warning purposes. Therefore, the FEWS NET Food Insecurity Severity Scale aims to support the development of the most comparable analysis possible to support decision making and planning at different levels. FEWS NET fully recognizes the significant amount of judgment that underlies this type of analysis. FEWS NET uses the latest available assessment and monitoring data, as well as baseline and historical data, to inform its scenario analysis. A consensus-based process engaging relevant experts in each country is conducted to determine the appropriate level of food insecurity to assign to each area.



Since FEWS NET performs food security outlook analyses regularly over the course of the year, FEWS NET has designed this food security classification to be dynamic. For example, an area or population may be classified by FEWS NET as no acute food insecurity, moderately food insecure, or highly food insecure at different times over the course of the year depending on seasonality and the timing of specific shocks, coping strategies, and other factors. Also, in the interest of highlighting key areas of concern for decision-makers, FEWS NET explicitly incorporates assumptions about likely humanitarian assistance in its analysis of food security outcomes.

### 36. *FOOD INSECURITY*

Developer 1	FAO
Description of Main Dimensions (Weights in Parenthesis)	Progress World Food Summit (WFS) goal of halving undernourished people
<a href="http://www.fao.org/publications/sofi/en/">http://www.fao.org/publications/sofi/en/</a>	

FAO reports on global and national efforts to reach the goal set by the 1996 World Food Summit: to reduce by half the number of undernourished people in the world by the year 2015. It monitors progress in hunger reduction based on accurate, reliable and timely methods that measure the prevalence of hunger, food insecurity and vulnerability and that also illustrate changes over time. FAO presents the latest estimates of the number of undernourished people and the proportion by country. It also presents the countries with food emergencies and their causes (“hunger hotspots”).

### 37. *FOOD SECURITY RISK INDEX*

Developer 1

Maplecroft

<http://www.maplecroft.com/about/news/food-security.html>

The Food Security Risk Index 2010, released by risk analysis and rating firm Maplecroft, evaluates the risks to the supply of basic food staples for 163 countries. It uses 12 criteria developed in collaboration with the World Food Programme, to calculate the ranking including: the nutritional and health status of populations, cereal production and imports, GDP per capita, natural disasters, conflict, and the effectiveness of government.

### 38. *DISASTER DEFICIT INDEX (DDI)*

Developer 1

InterAmerican Development Bank (IDB)

Description of Main

Dimensions (Weights in

Parenthesis)

1. Loss 2. Public sector resilience

<http://www.iadb.org/exr/disaster/ddi.cfm?language=EN&parid=2>

This index measures the economic loss that a particular country could suffer when a catastrophic event takes place, and the implications in terms of resources needed to address the situation. Construction of the DDI requires undertaking a forecast based on historical and scientific evidence, as well as measuring the value of infrastructure and other goods and services that are likely to be affected. In order to do this, we must define an arbitrary reference point in terms of the severity or periodicity of dangerous phenomena. The DDI captures the relationship between the demand for contingent resources to cover the losses caused by the Maximum Considered Event (MCE), and the public sector's economic resilience (that is, the availability of internal and external funds for restoring affected inventories).

$DDI = MCE \text{ Loss} / \text{Economic resilience}$

Potential losses were calculated using a model that takes into account different hazards (which are calculated in probabilistic form according to historical data on the intensity of past phenomena) and the actual physical vulnerability of the elements exposed to such phenomena. This analytical and predictive model is not based on historical measures of losses (deaths and

number of people affected), but rather on the intensity of the phenomena. Actuarial requirements imply that we must avoid making estimates of risk based on previous damage statistics over short time periods. Modeling must be done by inference, by evaluating the likelihood of high-impact, low probability events, as well as the vulnerability of infrastructure and other elements that are exposed to hazard. MCE has been defined with an arbitrary return period (we used three scenarios) as the worst situation, which requires feasible corrective or prospective planning actions to mitigate it in order to reduce potential negative effects for each country or subnational unit under study. The economic loss or demand for contingent resources (the numerator of the index) is obtained from modeling the potential impact of the MCE for three return periods: 50, 100 and 5004 years, whose probability during any 10 years exposure period is 18 percent, 10 percent and 2 percent, respectively. A particularly useful indicator for risk assessment is the expected annual loss,  $L/P$ , which is defined as the expected loss value in any one year. It is also known as the pure or technical premium. This value is equivalent to the annual average investment or saving that a country would have to make in order to approximately cover losses associated with future major events.

Economic resilience (the denominator of the index) represents internal and external resources that were available to the government when the evaluation was undertaken. However, access to these resources has limitations and costs that must be taken into account. Seven constraints are explicitly taken into consideration in this study: 1. *Insurance and reinsurance payments* for insured government-owned goods and infrastructure; 2. *Disaster reserve funds*; 3. Public, private, national or international *aid and donations*; 4. *New taxes*; 5. *Budgetary reallocations*, which usually corresponds to the margin of discretionary expenses available to the government; 6. *External credit* that the country could obtain from multilateral organizations and in the external capital market; and 7. *Internal credit* the country may obtain from commercial banks as well as the central bank.

The DDI captures the relationship between the demand for contingent economic resources to cover the economic losses that the public sector must assume, and the nation's economic resilience, that is, its ability of generate internal and external funds to replace the affected infrastructure and goods. A DDI greater than 1.0 reflects the country's inability to cope with extreme disasters even by going into as much debt as possible. The greater the DDI, the greater the gap between losses and the country's ability to face them. Government responsibility was restricted to the sum of losses associated with public sector buildings and housing for the lowest income population.

### 39. DISASTER RISK INDEX (DRI)

Developer 1	UNDP
Description of Main	
Dimensions (Weights in	1. Physical exposure 2. Relative vulnerability 3.
Parenthesis)	Vulnerability indicators
<a href="http://www.undp.org/cpr/disred/english/wedo/rrt/dri.htm">http://www.undp.org/cpr/disred/english/wedo/rrt/dri.htm</a>	

DRI measures the risk of death in disaster. The DRI enables the calculation of the average risk of death per country in large- and medium-scale disasters associated with earthquakes, tropical cyclones and floods, based on data from 1980 to 2000. It also enables the identification of a number of socio-economic and environmental variables that are correlated with risk to death and which may point to causal processes of disaster risk. In the DRI, countries are indexed for each hazard type according to their degree of physical exposure, their degree of relative vulnerability and their degree of risk. It does not provide an overall score nor does it rank countries.

The key steps involved in producing the DRI were:

*Calculation of physical exposure:* The DRI identified the areas exposed to each of the four hazard types (earthquakes, tropical cyclones, floods and droughts) and the population living in these areas to arrive at a calculation of physical exposure for each country. This is the average number of people exposed to a hazard event in a given year. Physical exposure for each hazard was mapped in a Geographical Information System. Physical exposure varies both according to the number of people as well as to the frequency of hazard events. In the DRI, physical exposure is expressed both in absolute terms (the number of people exposed in a country) and in relative terms (the number exposed per million people).

*Calculation of relative vulnerability:* The risk of death in a natural disaster is a function of physical exposure to a hazardous event and vulnerability to the hazard. People are more or less vulnerable to a given hazard depending on a range of social, economic, cultural, political and physical variables. The DRI has used the number of people actually killed by each hazard type in each country as a proxy for manifest risk. In other words, the occurrence of past disasters manifests, by definition, the existence of conditions of physical exposure and vulnerability.

The DRI, therefore, was able to calculate the relative vulnerability of a country to a given hazard by dividing the number of people killed by the number exposed. When more people are killed with respect to the number exposed, the relative vulnerability to the hazard in question is higher.

Calculation of vulnerability indicators: The DRI then examined the manifest risk for each hazard type against a bundle of social, economic and environmental indicators through a statistical analysis using a multiple logarithmic regression model. A total of 26 variables selected through expert opinion were available as global datasets and analysed for each hazard type. This enabled the selection of those vulnerability indicators that were most associated with risk for each hazard type.

#### 40. *GLOBAL NATURAL DISASTERS RISKS HOTSPOTS*

Developer 1	Columbia University
Description of Main	Earthquakes, volcanoes, landslides, foods, drought
Dimensions (Weights in	and cyclones
Parenthesis)	
<a href="http://www.ldeo.columbia.edu/chrr/research/hotspots/">http://www.ldeo.columbia.edu/chrr/research/hotspots/</a>	

Natural disaster risk hotspots are countries or regions whose populations or economic activities are at extreme risk from multiple natural hazards. The hotspots project team compiled event data for six natural hazards—earthquakes, volcanoes, landslides, floods, drought, and cyclones—to identify regions of significant hazard activity throughout the world. The hotspots maps show the specific regions of the world at highest risk from natural disasters. Using population data and Gross Domestic Product (GDP) at the sub-national level, the team and their international partners then assessed the risks of mortality and economic loss for combined hazards.

#### 41. LOCAL DISASTER INDEX (LDI)

Developer 1	InterAmerican Development Bank (IDB)
Description of Main Dimensions (Weights in Parenthesis)	1. Deaths 2. Number of people affected and 3. Losses
<a href="http://www.iadb.org/exr/disaster/ldi.cfm?language=EN&amp;parid=3">http://www.iadb.org/exr/disaster/ldi.cfm?language=EN&amp;parid=3</a>	

This index represents the propensity of a country to experience small-scale disasters and their cumulative impact on local development. The index attempts to represent the spatial variability and dispersion of risk in a country resulting from small and recurrent events. This approach is concerned with the national significance of recurrent small scale events that rarely enter international, or even national, disaster databases, but which pose a serious and cumulative development problem for local areas and, more than likely, also for the country as a whole. These events may be the result of socio-natural processes associated with environmental deterioration and are persistent or chronic in nature. They include landslides, avalanches, flooding, forest fires, and droughts as well as small earthquakes, hurricanes and volcanic eruptions. For the purposes of this study, we classified the various types of events registered in the DesInventar database into six phenomena: geodynamic (internal and external), hydrological, atmospheric, technological, and biological. To further simplify, external geodynamic phenomena are referred to as landslides and debris flows, whereas internal geodynamic phenomena are referred to as seismo-tectonic. Hydrological and atmospheric phenomena were grouped and are referred to as floods and storms. Finally, technological and biological phenomena are simply referred to as other events. In addition, the database was standardized to take into account three variables: i) the number of deaths, ii) the number of people affected by the events, and iii) direct losses (that is, the economic value of housing and crops lost or damaged) for the four types of event.

The database also combines disaggregated data for the number of people affected by disasters with that for people left homeless. The reason for doing this is that in some countries both designation depict the same thing. Destroyed and affected housing are also aggregated; an “affected” house is equivalent to one-quarter of a destroyed house. The cost of rebuilding destroyed houses is taken to be the average cost of a social housing unit during the period of analysis. The value of one hectare of crops was calculated on the basis of the weighted average price of crop areas that are usually affected by disasters, taking into account expert opinion in the

country at the time of analysis. The LDI is equal to the sum of three local disaster subindicators that are calculated based on data from the DesInventar database for number of deaths, number of people affected and losses in each municipality.

$$\text{Deaths Affected Losses LDI} = \text{LDI}_K + \text{LDI}_A + \text{LDI}_L$$

The Local Disaster Index captures simultaneously the incidence and uniformity of the distribution of local effects. That is, it accounts for the relative weight and persistence of the effects attributable to phenomena that give rise to municipal scale disasters. The higher the relative value of the index, the more uniform the magnitude and distribution of the effects of various hazards among municipalities. A low LDI value means low spatial distribution of the effects among the municipalities where events have occurred. Figure 5 shows the total LDI in 2000, which was obtained by adding its three components: the LDI related to the number of deaths (K), the number of people affected (A), and total losses (L).

#### 42. PREVALENT VULNERABILITY INDEX (PVI)

Developer 1	InterAmerican Development Bank (IDB)
Description of Main	1. Exposure 2. Fragility 3. Resilience (equal weights)
Dimensions (Weights in Parenthesis)	
<a href="http://www.iadb.org/exr/disaster/pvi.cfm?language=En&amp;parid=4">http://www.iadb.org/exr/disaster/pvi.cfm?language=En&amp;parid=4</a>	

This index depicts predominant vulnerability conditions by measuring exposure in prone areas, socioeconomic fragility and lack of social resilience. These items provide a measure of direct as well as indirect and intangible impacts of hazard events. The index is a composite indicator that provides a comparative measure of a country's pattern or situation.

The PVI is an average of these three types of composite indicators:

$$PVI = (PVI_{\text{Exposure}} + PVI_{\text{Fragility}} + PVI_{\text{Resilience}}) / 3$$

The indicators used for describing exposure, prevalent socioeconomic conditions and lack of resilience have been estimated in a consistent fashion (directly or in inverse fashion, accordingly), recognizing that their influence explains why adverse economic, social and environmental impacts take place following a dangerous event. Each one is made up of a set of indicators that

express situations, causes, susceptibilities, weaknesses or relative absences affecting the country, region or locality under study, and which would benefit from risk reduction actions. The indicators were identified based on figures, indices, existing rates or proportions derived from reliable databases available worldwide or in each country

#### 43. RISK MANAGEMENT INDEX (RMI)

Developer 1	InterAmerican Development Bank (IDB)
Description of Main Dimensions (Weights in Parenthesis)	1. Identification of risk, 2. Risk reduction, 3. Disaster management, and 4. Governance and financial protection
	<a href="http://www.iadb.org/exr/disaster/rmi.cfm?language=EN&amp;parid=5">http://www.iadb.org/exr/disaster/rmi.cfm?language=EN&amp;parid=5</a>

This index was designed to assess risk management performance. It provides a qualitative measure of management based on predefined targets or benchmarks that risk management efforts should aim to achieve. The design of the Risk Management Index involved establishing a scale of achievement levels or determining the “distance” between current conditions and an objective threshold or conditions in a reference country.

The RMI was constructed by quantifying four public policies, each of which has six indicators. The policies include the identification of risk, risk reduction, disaster management, and governance and financial protection. Risk identification (RI) is a measure of individual perceptions, how those perceptions are understood by society as a whole, and the objective assessment of risk. Risk reduction (RR) involves prevention and mitigation measures. Disaster management (DM) involves measures of response and recovery. And, finally, governance and financial protection (FP) measures the degree of institutionalization and risk transfer. The RMI is defined as the average of the four composite indicators:

$$RMI = (RMI_{RI} + RMI_{RR} + RMI_{DM} + RMI_{FP})/4$$

Each indicator was estimated based on five performance levels (*low, incipient, significant, outstanding, and optimal*) that correspond to a range from 1 (low) to 5 (optimal). This methodological approach permits the use of each reference level simultaneously as a “performance target” and allows for comparison and identification of results or achievements. Government efforts at formulating, implementing, and evaluating policies should bear these performance targets in mind.



44. *TERRORISM RISK INDEX (TRI)*

Developer 1

Maplecroft

<http://maplecroft.com/about/news/terrorism.html>

The Terrorism Risk Index (TRI) is developed by global risks advisory firm, Maplecroft, to enable organisations to identify and monitor terrorism risks to human security and international assets.

The index uses data from June 2009 to June 2010 to assess the frequency of terrorist incidents and the intensity of attacks, which includes the number of victims per attack and the chances of mass casualties occurring. It also includes a historical component assessing the number of attacks between 2007 and 2009 and looks at whether a country is at risk from a long-standing militant group operating there.

## About the author

**Michaela Saisana** has been a Scientific Officer at the Joint Research Centre (JRC) of the European Commission (Italy) since 1998. She has audited more than 60 composite indicators, upon request of their developers, including Yale and Columbia University, World Economic Forum, Harvard School of Economics, INSEAD, World Intellectual Property Organization, Bertelsmann Foundation, New York Medical College, University of S. Carolina- Criminology and Criminal Justice, World Justice Project, Transparency International and others. She is offering regularly courses on the development and robustness assessment of composite indicators to the academia, international organizations, and European Commission officials. She is a principal author of the 2008 OECD/JRC Handbook on Composite Indicators, co-author of the book *Global Sensitivity Analysis: The Primer* (2008), and developer and moderator of the JRC Information server on composite indicators. Her publications deal with sensitivity analysis, composite indicators, multicriteria analysis, multivariate analysis, multi-objective optimization, and air quality modelling and forecasting (20 peer-reviewed publications, 50 working papers). In 2004 she won the European Commission – JRC Young Scientist Prize in Statistics and Econometrics, awarded by the then Commissioner for Research Janez Potočnik. She has a PhD and an MSc in Chemical Engineering from the National Technical University of Athens (received with Awards from the Technical Chambers of Greece).

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**Abstract**

The document presents an overview of some popular risk-related and resilience-related composite indicators and ratings that are currently available in the literature. The description of these indices is taken directly from the author or organization, that is, they are excerpts from websites and publications. The sources from which these excerpts were taken are clearly listed in each index entry.

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