



WHAT IS RISK ALL ABOUT?

“CONVERTING RISKS INTO SPRINGBOARDS OF SUCCESS”

CIFE SEMINAR ROMA-BERLIN-NICE 2024-25
MICHEL-HENRY BOUCHET

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CAN YOU PREDICT RISK? RISK = UNCERTAINTY = INFORMATION DEFICIT

The collage consists of several distinct images:

- Top left: A protest scene with a person holding a sign that says "NO HAY COMIDA" (No food) in front of riot police.
- Top center: A line graph titled "Brent crude prices spike on Saudi disruption" showing price fluctuations from Sep 09 to Sep 14, with a price of \$5 per barrel.
- Top right: A stock market chart for "CAC 40" showing a variance of -6.62% over 3 months, with a price of 5,421.
- Bottom left: A North Korean nuclear missile being launched from a mobile launcher vehicle.
- Bottom center-left: A woman carrying a flag in a conflict zone.
- Bottom center-right: A portrait of Donald Trump.
- Bottom right: The World Trade Center towers on 9/11, with one tower engulfed in flames and smoke.

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2 TYPES OF CRISES:



► Type 1 Crisis

It emerges brutally, its timing cannot be anticipated, and it requires drastic adjustment

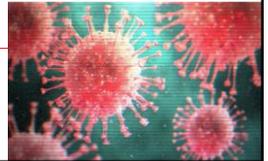
1. 1929 crisis
2. 1973 OPEC oil crisis
3. 12/2004 Asian tsunami
4. 2011 earthquake-driven Fukushima disaster
5. Twin Towers 1/11
6. Turkish lira crisis 04/2021



► Type 2 Crisis

It emerges brutally, it is unprecedented but probable, and it could have been expected

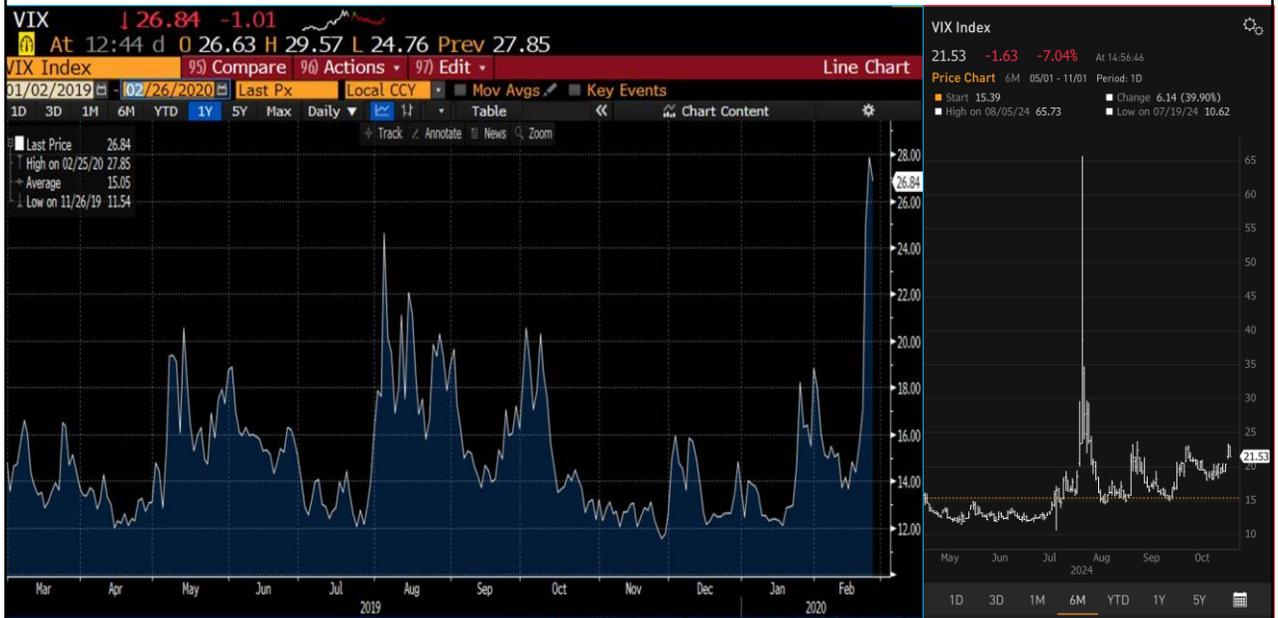
1. 1985 EMCs debt crisis
2. 1986 Chernobyl
3. 1999 Asian banking crisis
4. 2008 financial crisis
5. **Covid-19** (CIA 2005 report, Bill Gates 2015 TED talk, 2016 World Bank Facility, Obama 2016 pandemic report, 10/2019 Crimson Contagion planning)
6. **Russia's war against Ukraine**
7. **10/7/24 Hamas attack and subsequent retaliatory spiral**
8. (next) **Climate change crisis!**



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VIX = « FEAR INDEX » : Q1-2020 AND Q4-2024



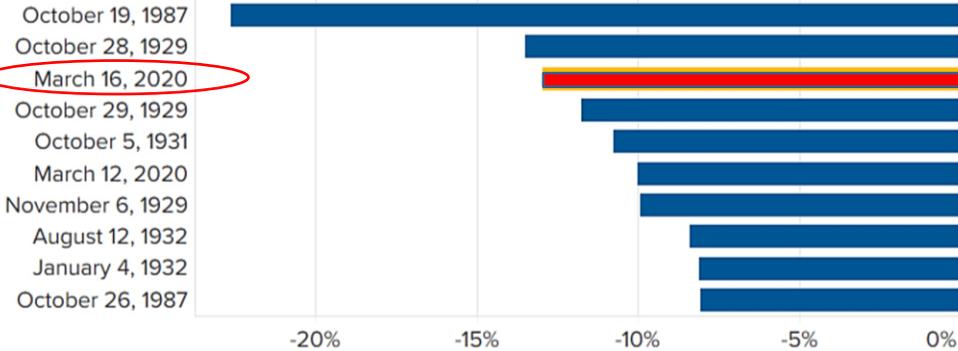
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ANTICIPATING ABRUPT STOCK MARKET DOWNTURNS WHAT IS THE ULTIMATE TRIGGER?

Biggest Dow losses of all time

Dow Jones Industrial Average's 10 largest one-day percentage drops



SOURCE: FactSet. Data as of market close on 3/16/2020.



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TOTAL SOVEREIGN DEBT IN DEFAULT 1975-2024

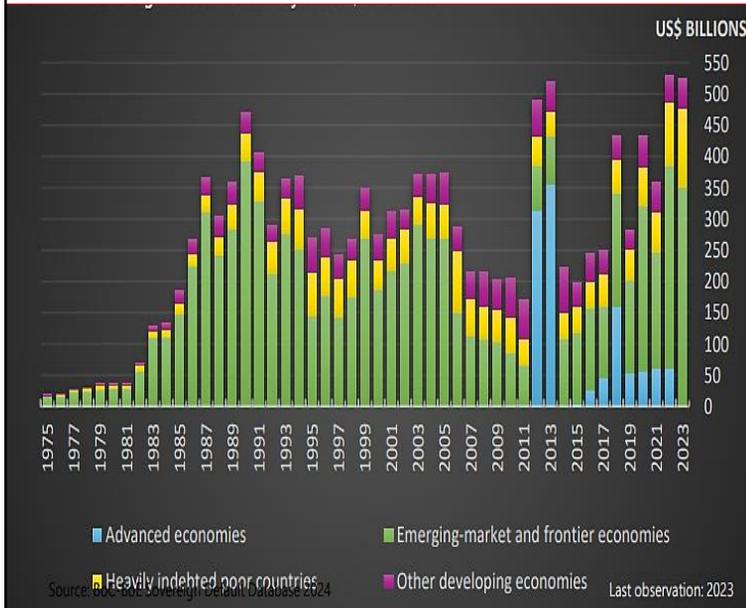
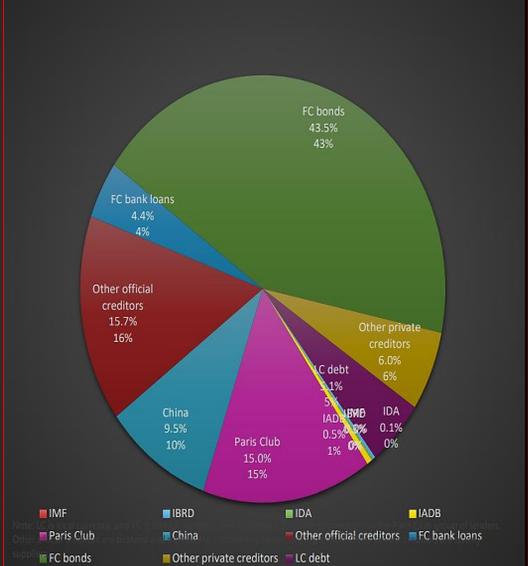


Chart 1: Total share of debt in default by creditor, 2023



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WHICH KEY QUESTIONS WILL UNDERPIN RISK ASSESSMENT STRATEGIES?

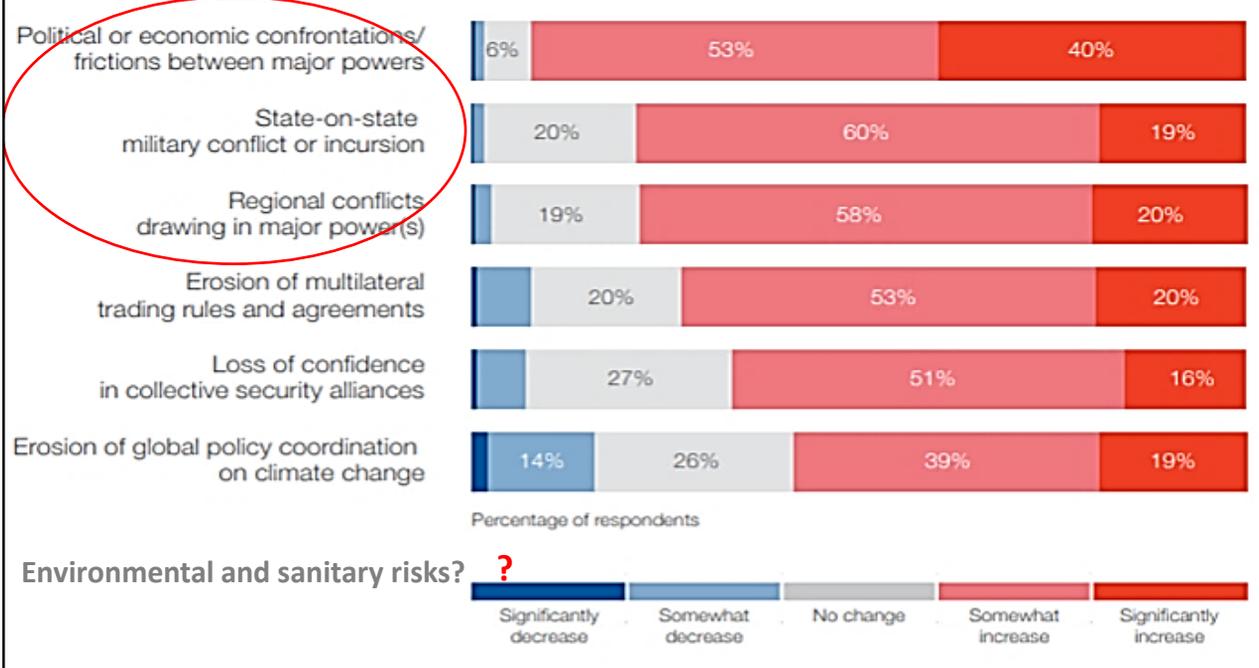
1. What about the **time frame**?
2. What about the risk **exposure**? (investor, exporter, importer, banking, NGO, IFI)
3. What is the **type** of risk? (direct, indirect, spill-over?)
4. What is the risk **profile**, e.g., sectoral, global, economic, socio-political, institutional, country specific?
5. Can the risk be **mitigated**?
6. Can the risk consequences be **insured**? e.g. MIGA, OPIC, Coface...

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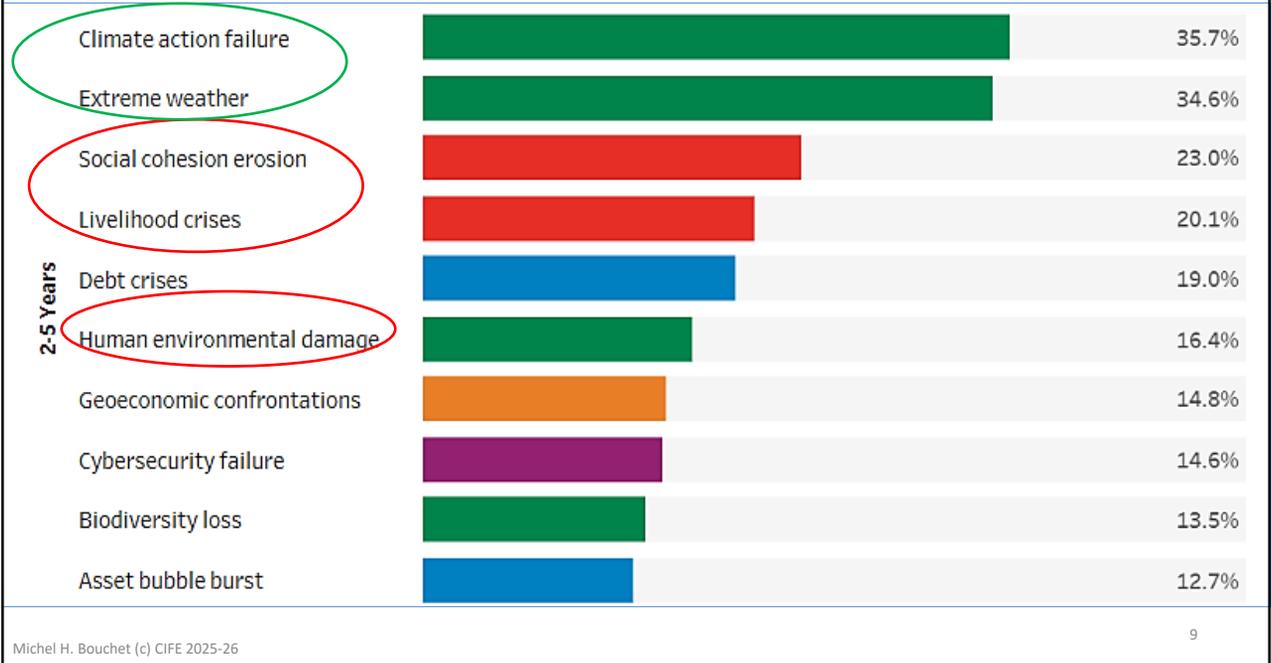
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2020 WEF SURVEY: RISKS ARE ABOUT TO INCREASE OR DECLINE IN 2020-25?



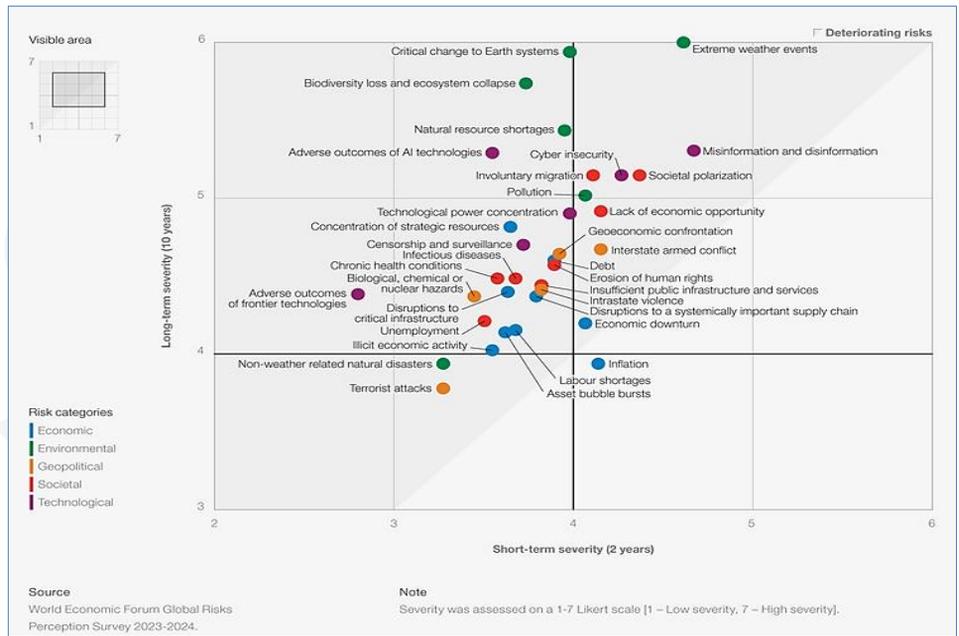
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WEF 2023-24 GLOBAL RISK PERCEPTION SURVEY

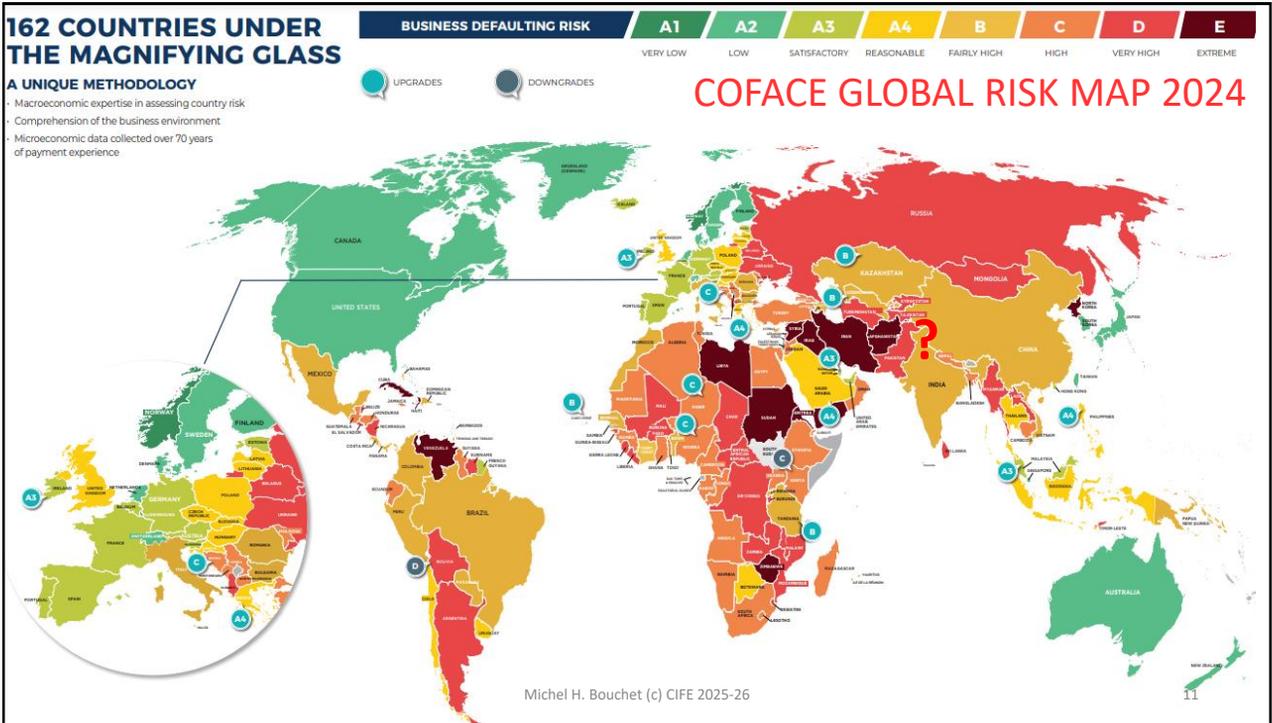


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WEF RISK PERCEPTIONS OVER 2-10 YEAR HORIZON



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WHAT IS RISK?

► Risk stems from all the negative consequences of the Unknown

- “Risk means more things **can** happen than will happen.” Elroy Dimson
- “Risk” derives from the early Italian *risicare* = “to dare” : risk is a **choice** rather than a fate.

(Peter L. Bernstein- *Against the Gods: The Remarkable Story of Risk*)

Risk is always related to Uncertainty!

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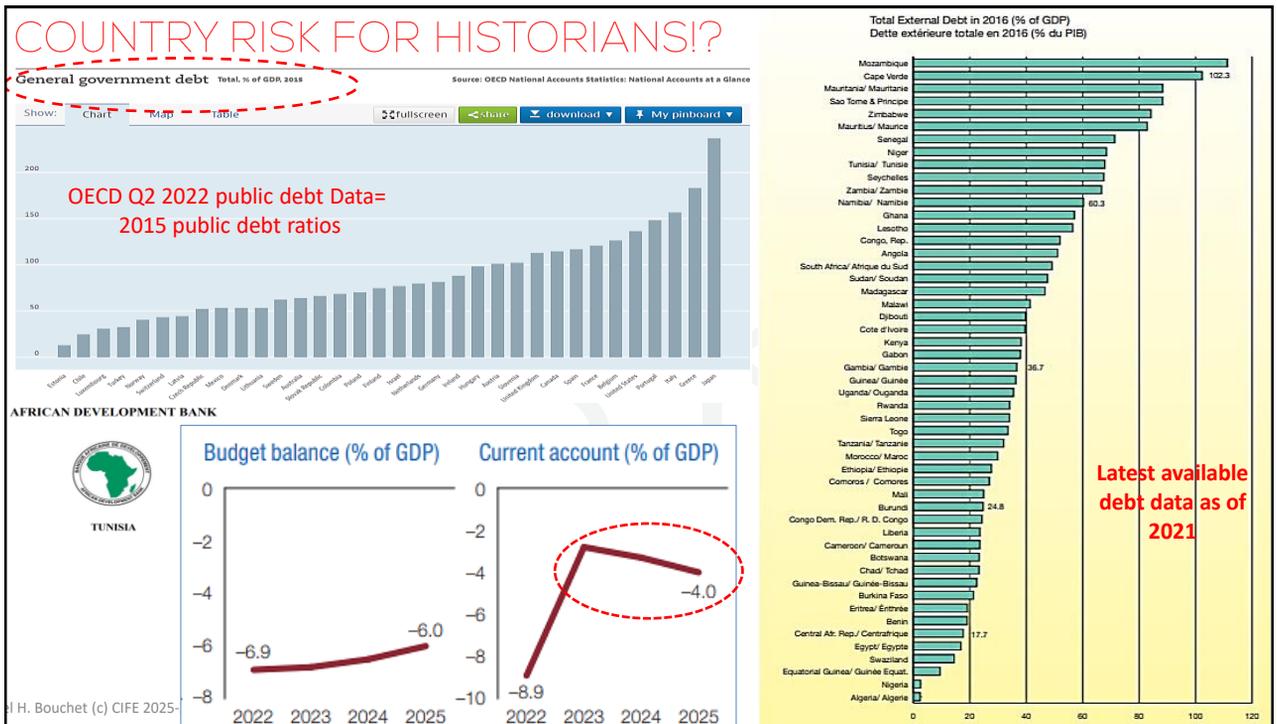
► Risk stems from all the uncertainty regarding current or future situations, where information about the situation's outcome is **insufficient, lacking or wrong**

- Information availability = measure of risk (BOP, debt data, income gaps, governance, corruption...)
- Information scarcity = taking action might produce negative and costly consequences (investigation time, transaction cost, delays...)

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RISK & UNCERTAINTY

► **Frank Knight: 1921** Risk stems from **outcomes that are unknown** but can be tackled with probability distribution....
Uncertainty stems from a deficit of information, hence randomness of results

► **Harry Markowitz: 1959:** Risk = probability of loss = historical volatility in returns as measured by standard deviation or Beta.
But **risk diversification** and tolerance also matter!

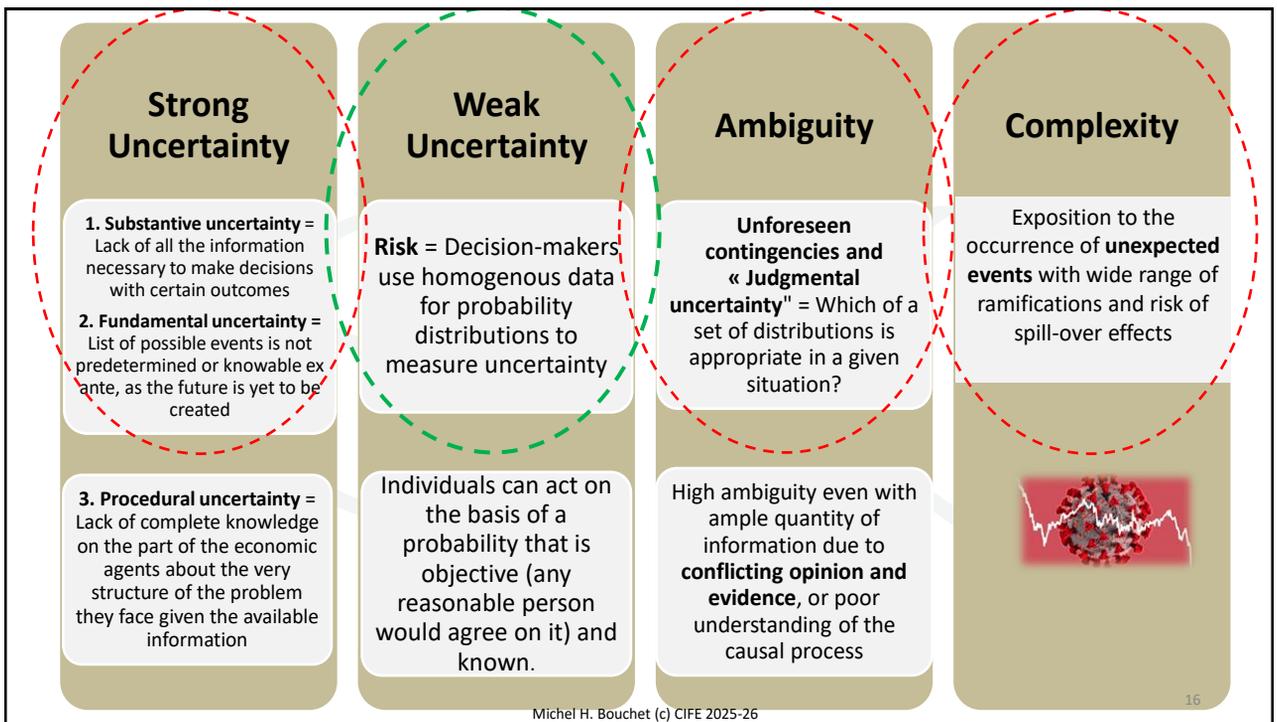
► **J M. Keynes: (Treatise on Probability 1921):** **Non-linear nature** of risks and danger of expecting the future as simple projection of the past: Role of animal spirits in volatility spill-over and herd behavior

► **Ulrich Beck: 2010:** « Global risk society where current decisions and technological developments trigger **long-term global impact** » (warming, terrorism, pollution, financial deregulation...)= secular stagnation?

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ILLUSTRATION OF COUNTRY RISK EXAMPLES OF EVENT UNCERTAINTY

Country Risk Event	Strong uncertainty ?	Weak & measurable uncertainty	Ambiguity ?	Complexity ?
Economic events	FDI decision in post-Brexit UK	Exchange rate depreciation	Inflation decrease; growth slowdown	Sharp fall in oil prices Corona Virus
Socio-political events	Revolution, strikes and coup d'état	New market-oriented and pro-business government	High rate of electoral abstention	Upcoming elections; mounting corruption
Financial events	Nationalization of banking system	Interest-rate increase	Over-valuation of tech companies QE & ultra-low rates	External debt default
Spill-over events	Regional crisis contamination	US economic recession	€/USD volatility	Regional competitive devaluations Systemic crisis

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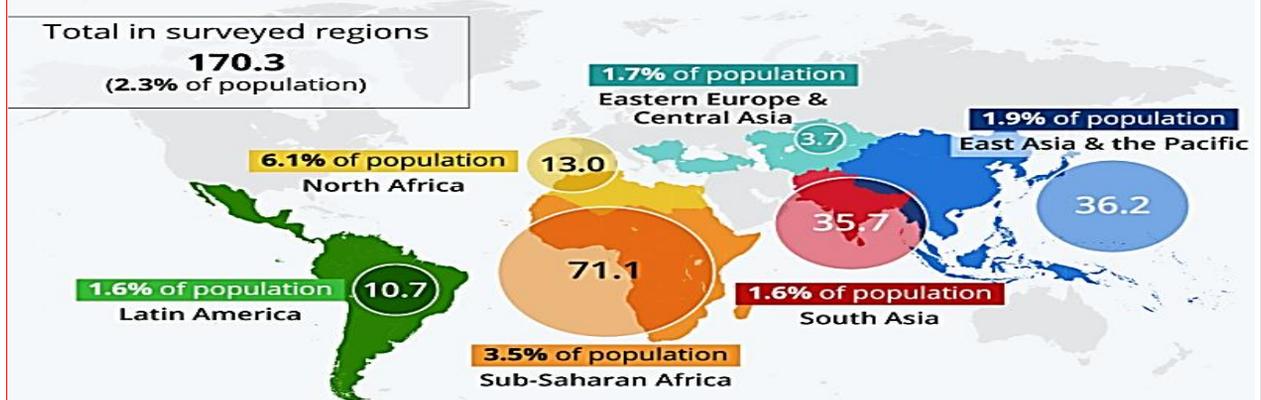
ECONOMIC AND SOCIO-POLITICAL + REGIONAL CONTAMINATION

Climate Change, the Great Displacer

Average number of internal climate migrants by 2050 per region (in millions)*



Total in surveyed regions
170.3
(2.3% of population)



* Modeled on pessimistic reference = High emission & unequal development scenarios concerning water availability, crop productivity and sea-level rise
Source: World Bank

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THE DISCOVERY OF RISK



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**XIII° CENTURY:
GRADUAL SHIFT
FROM CIRCULAR
TIME TO
LINEAR TIME**

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RISK HAS TO DO WITH **UNCERTAINTY** REGARDING THE FUTURE,
HENCE THE NEED OF TACKLING FUTURE PROSPECTS!



« Ancient times » = circular time... until the Middle Age
XV^o century Renaissance = « Modern time » & Merchant time
= linear time of economic & financial transactions +
secular progress



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THE « DISCOVERY » OF RISK



Pascal 1654



Fermat 1654



Leibniz 1703



Markowitz 1959



M. Scholes 1990

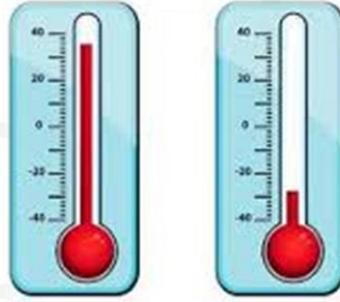


B. Mandelbrot 1990

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THE DISCOVERY OF THE MEASURE OF RISK



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NICOLAS DE CONDORCET: 1765: PROBABILITY DISTRIBUTION AND STATISTICS (BEGINNING OF BIG DATA?)



Robert Brown: Scottish botanist: in 1827, while examining grains of pollen suspended in water under a microscope, Brown observed minute particles ejected from the pollen grains, **executing a continuous jittery motion**



Jules Regnault (1863): « Le calcul des chances » : random walk model of stock price variations (good/bad speculation)



Louis Bachelier (1900): **stock price forecasting** is impossible due to endless number of influences though it is possible to study **probability distribution of price variations** (sigma) = volatility risk



Alfred Cowles (1933): forecasting stock market prices is impossible (large gap between actual stock prices and professional forecasting)

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LOOKING TOWARD EARLY WARNING SIGNALS OF UPCOMING CRISIS

THE CANARI IN THE COAL MINE?



- ▶ IMF & WB + UN reports?
 - ▶ Rating agencies?
 - ▶ CDS prices?
- ▶ Stock market volatility
 - ▶ Vix Index
 - ▶ Spreads and yields
- ▶ Minsky's speculative bubbles and herd-instinct
- ▶ B. Mandelbrot's fractal geometry
- ▶ N. Taleb's Black Swans
- ▶ D. Sornette's Dragon-Kings (extreme events)
 - ▶ Capital Flight?
- ▶ Cife governance barometer?

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MEASURING UNCERTAINTY IS CHALLENGING!

High levels of uncertainty can freeze investment and consumption, tank markets, and help spark a recession! The three main measures rely on textual analysis, financial markets, and business surveys.

1. Text-based measures (newspapers, country reports & official publications) show exceptionally high levels of uncertainty. The **Economic Policy Uncertainty index (EPU-2016)** analyzes articles in hundreds of newspapers for mentions of terms related to economics, policy, and uncertainty. The US EPU has typically surged during crises, spiking after 2008 financial crisis and 2020 COVID pandemic. In 2025, the EPU reached a record high, indicating extensive discussions of uncertainty in national and local newspapers.

To reduce media bias: **EIU-based World Uncertainty Index (WUI)**.

2. Financial-market-based measures show only moderate levels of uncertainty at end-2025 despite trade and geopolitical tensions. Chicago Board Options Exchange Volatility Index (VIX) calculates the one-month-ahead implied volatility of the S&P 500 Index of US stocks, based on a basket of put and call options.

3. Survey-based measures (US Survey of Business Uncertainty SBU-Atlanta Federal Reserve Bank) which spiked during the pandemic, have largely flatlined.

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MEASURING UNCERTAINTY?

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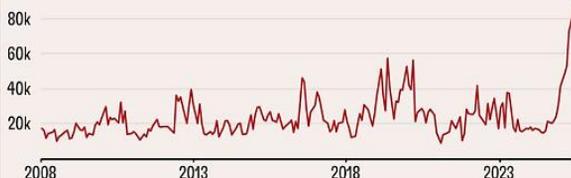
Words point to turmoil

Text-based measures of uncertainty reach new heights in 2025.

US Economic Policy Uncertainty Index



World Uncertainty Index



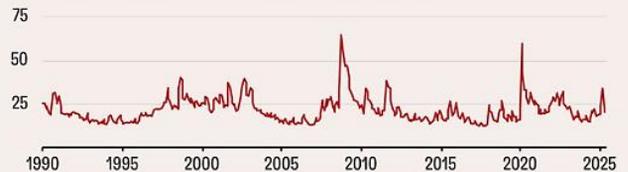
SOURCES: Baker, Bloom, and Davis 2016; and Ahir, Bloom, and Furceri 2022.

NOTE: An increase in the index means that uncertainty is rising and vice versa.

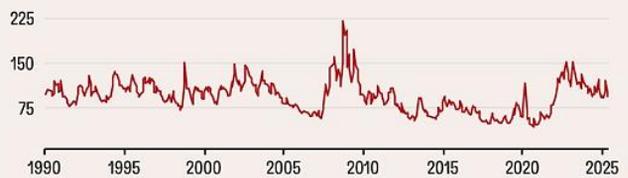
Markets stir, don't shake

Financial market measures signal modest rise in uncertainty.

Chicago Board Options Exchange Volatility Index (VIX)



Intercontinental Exchange Bank of America MOVE Index



SOURCES: Federal Reserve Economic Data; and Haven Analytics.

NOTE: The VIX measures expected stock market volatility and reflects investor fear about equity markets; the MOVE Index gauges volatility in US Treasury bond markets.

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MEASURING « EXPECTED GLOBAL ECONOMIC UNCERTAINTY » 2007-25

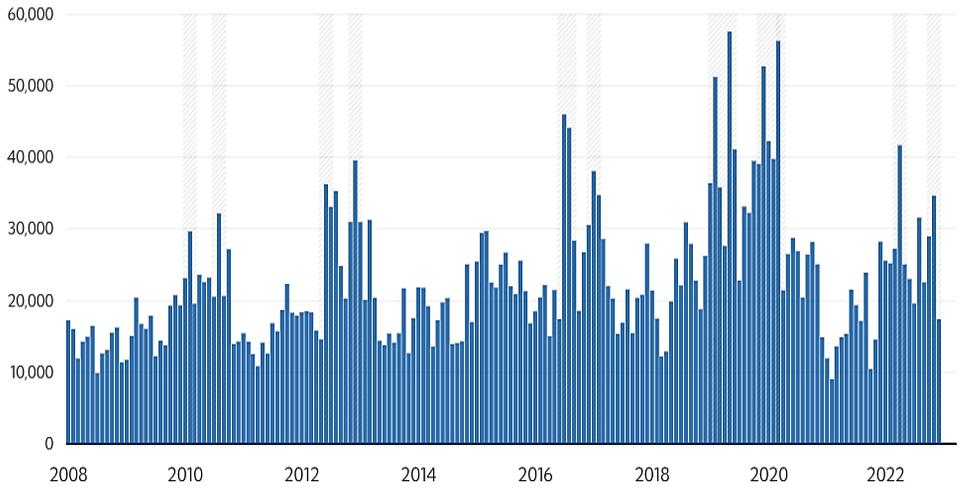
Monthly Index with 3 underlying components:

- 1. EIU coverage of policy-related economic uncertainty.
- 2. number of federal tax code provisions set to expire in future years.
- 3. disagreement among economic forecasters as a proxy for uncertainty.

World Uncertainty Index

Uncertainty surged again following Russia's invasion of Ukraine.

(Index, GDP weighted average)



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Source= IMF, Stanford, Chicago + Northwestern-Kellogg School universities (143 countries)

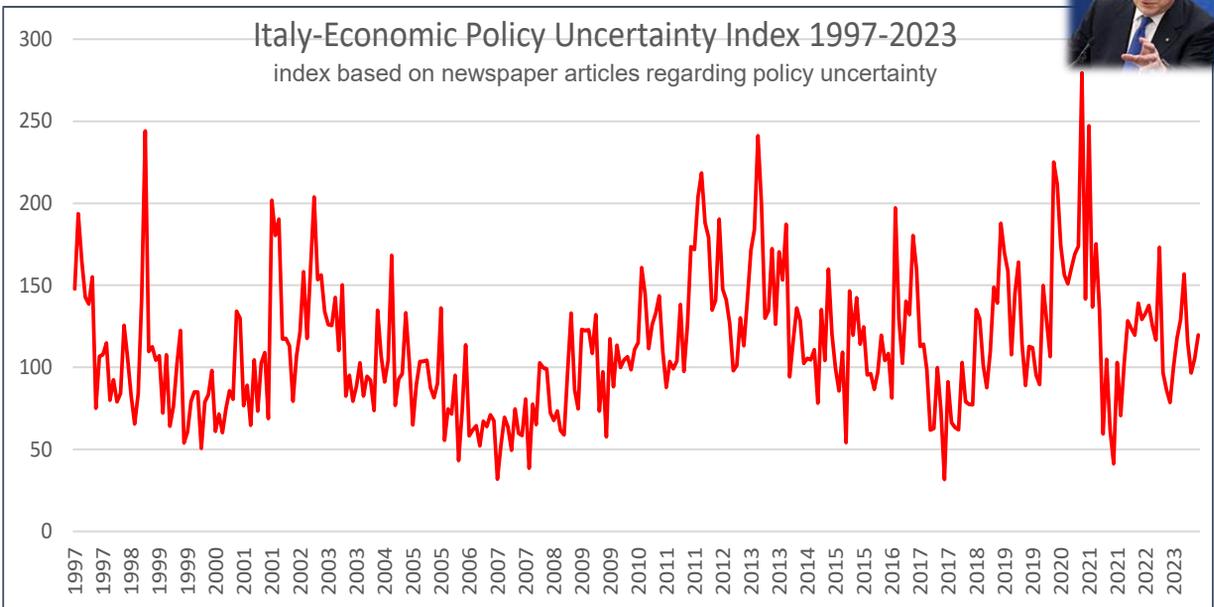
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THE UPS AND DOWNS OF ECONOMIC POLICY RISK & UNCERTAINTY



Italy-Economic Policy Uncertainty Index 1997-2023

index based on newspaper articles regarding policy uncertainty

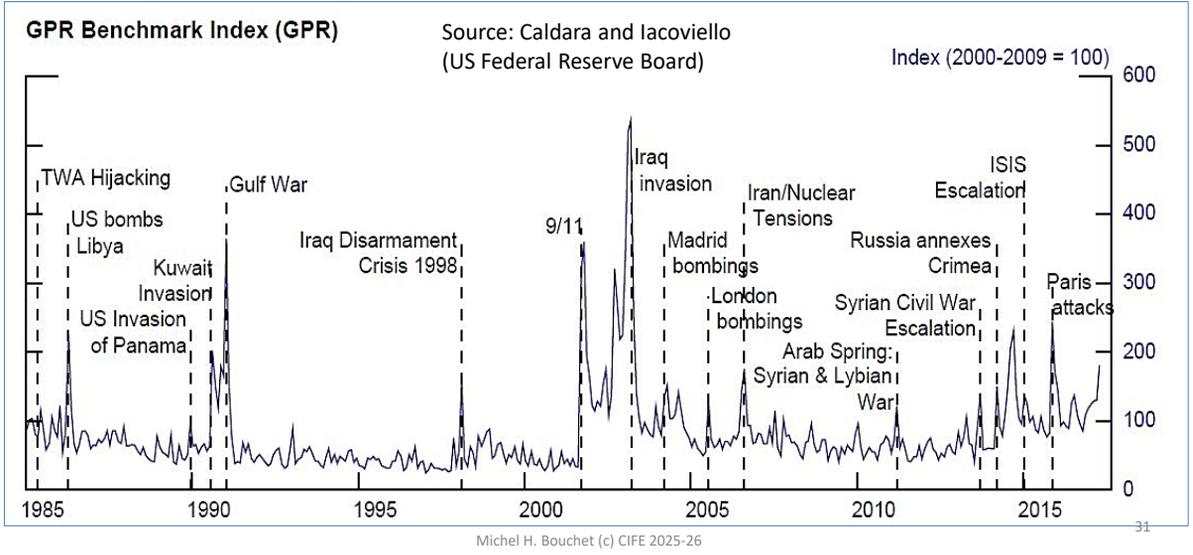


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THE GEOPOLITICAL RISK INDEX

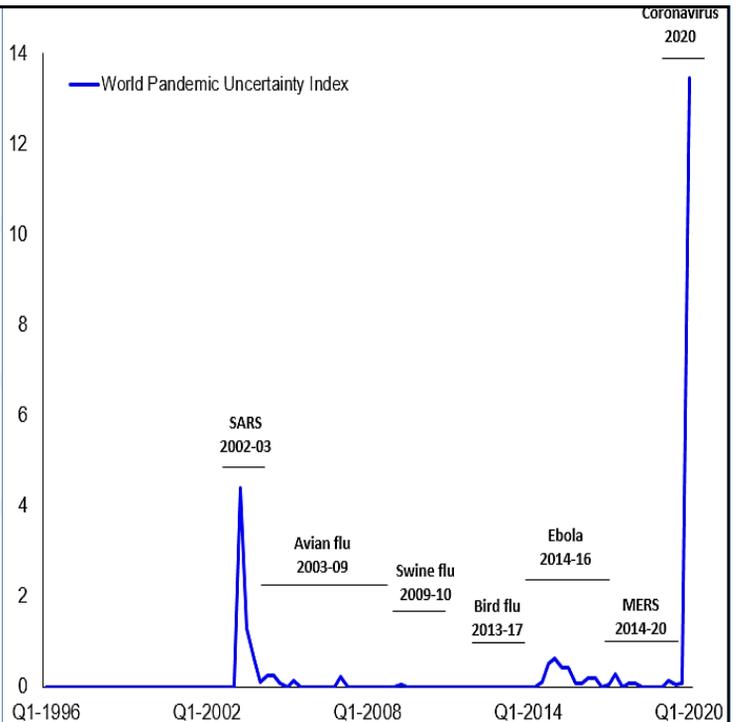
MONTHLY INDEX OF GEOPOLITICAL RISK COUNTING THE OCCURRENCE OF WORDS RELATED TO GEOPOLITICAL TENSIONS IN 11 LEADING INTERNATIONAL NEWSPAPERS. THE INDEX IS NORMALIZED TO AVERAGE A VALUE OF 100 IN THE 2000-2009 DECADE. KEY INPUTS = GEOPOLITICAL RISK, MILITARY-RELATED TENSIONS, NUCLEAR TENSIONS. WAR THREATS AND TERRORIST THREATS, TERRORIST ACTS OR THE BEGINNING OF A WAR.



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THE WORLD PANDEMIC UNCERTAINTY INDEX 1996-2020

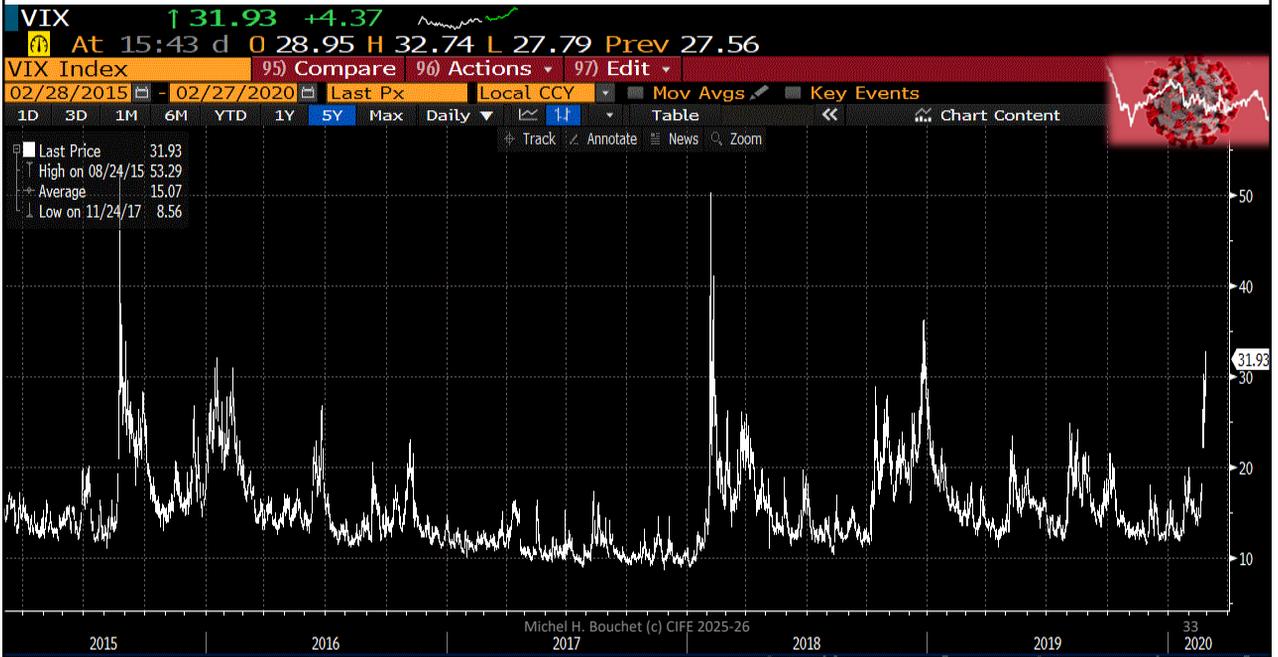
Note: The WPUI is the number of times that a word out of 100,000 in a given EIU country report mentions the word uncertainty near a word related to pandemics or epidemics. A higher number means higher global uncertainty around pandemics/epidemics and vice-versa. The numbers for 2020Q1 are based on the reports for March or the latest available. The WPUI is a sub-index of the World Uncertainty Index (<https://worlduncertaintyindex.com/>).



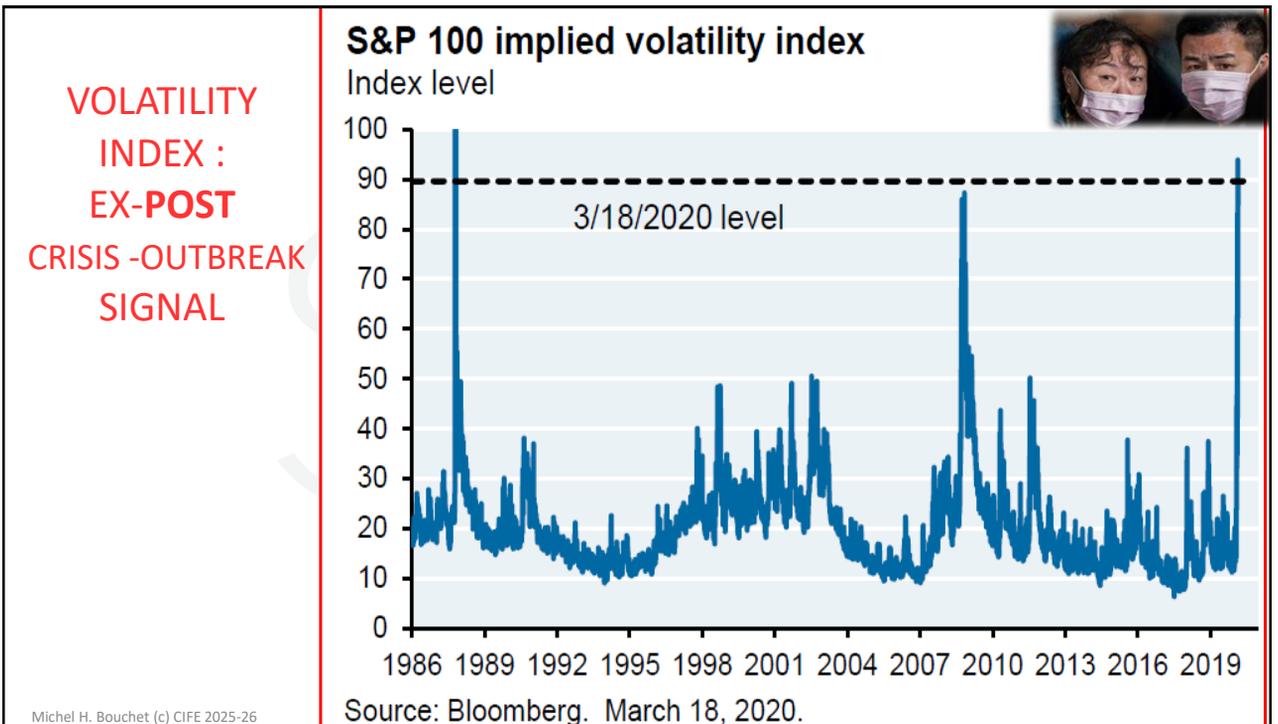
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VIX INDEX IN PERSPECTIVE: 2015-2021



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CHALLENGE? HOW PREDICTING AN ABRUPT SOCIO-POLITICAL CRISIS?



Liquidity indicators

- ▶ Inflation
- ▶ Foreign-exchange reserves
- ▶ interest rates differential
- ▶ Non-compressible import cover
- ▶ Debt servicing ratio and current account deficit
- **Socio-political and behavioral indicators**
 - Corruption and institutional weaknesses
 - Political turmoil
 - Capital flight
 - Bank run : number of customers withdraw their deposits simultaneously due to concerns about banking solvency

Solvency and structural indicators

- ▶ Debt levels (Debt/GDP, Debt/X, ST Debt)
- ▶ Worsening terms of trade
- ▶ Productivity's protracted weakness
- **Exogenous and global indicators**
 - Systemic crisis
 - Regional crisis contagion
 - Commodity prices
 - \$ Exchange rate volatility

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THE COMPLEXITY OF FINANCIAL RISK!

Cost to protect against Turkish debt default abruptly jumps
Five year CDS spread (basis points)



Source: Refinitiv
© ET



Naci Agbal in his office in February 2021, and his successor, Sıhıp Kavcıođu, less than two months later © Reuters

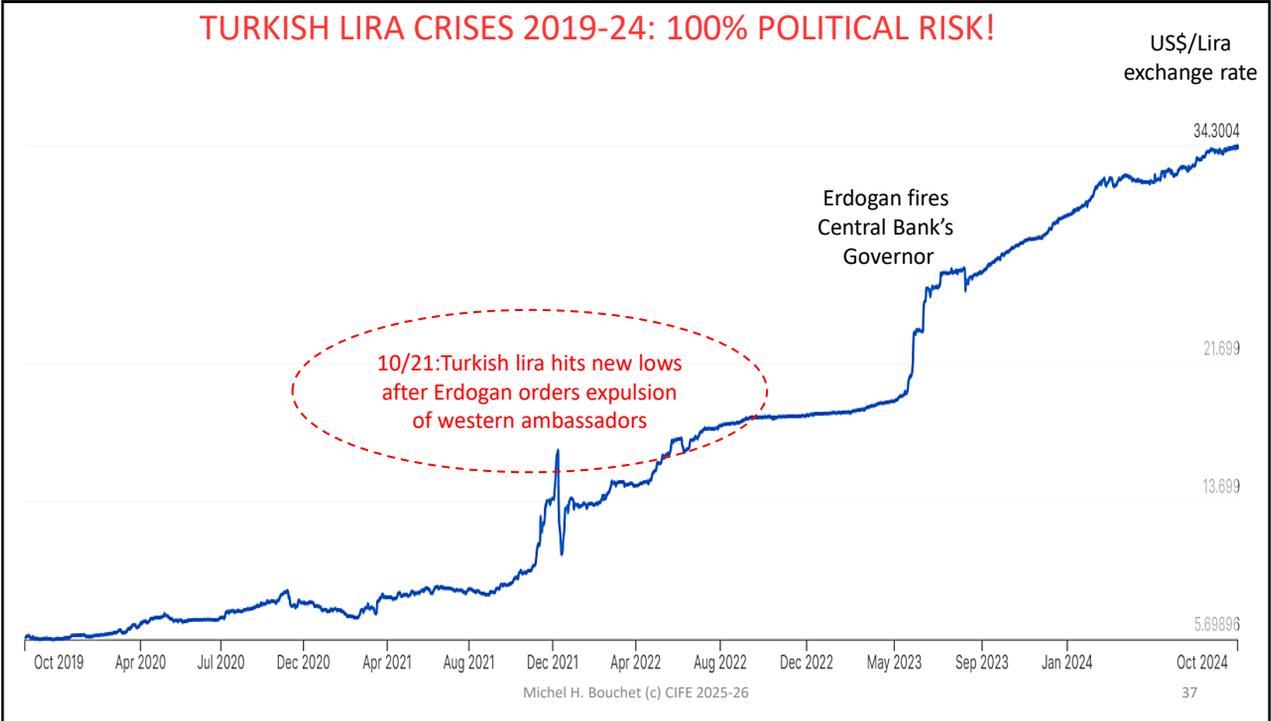


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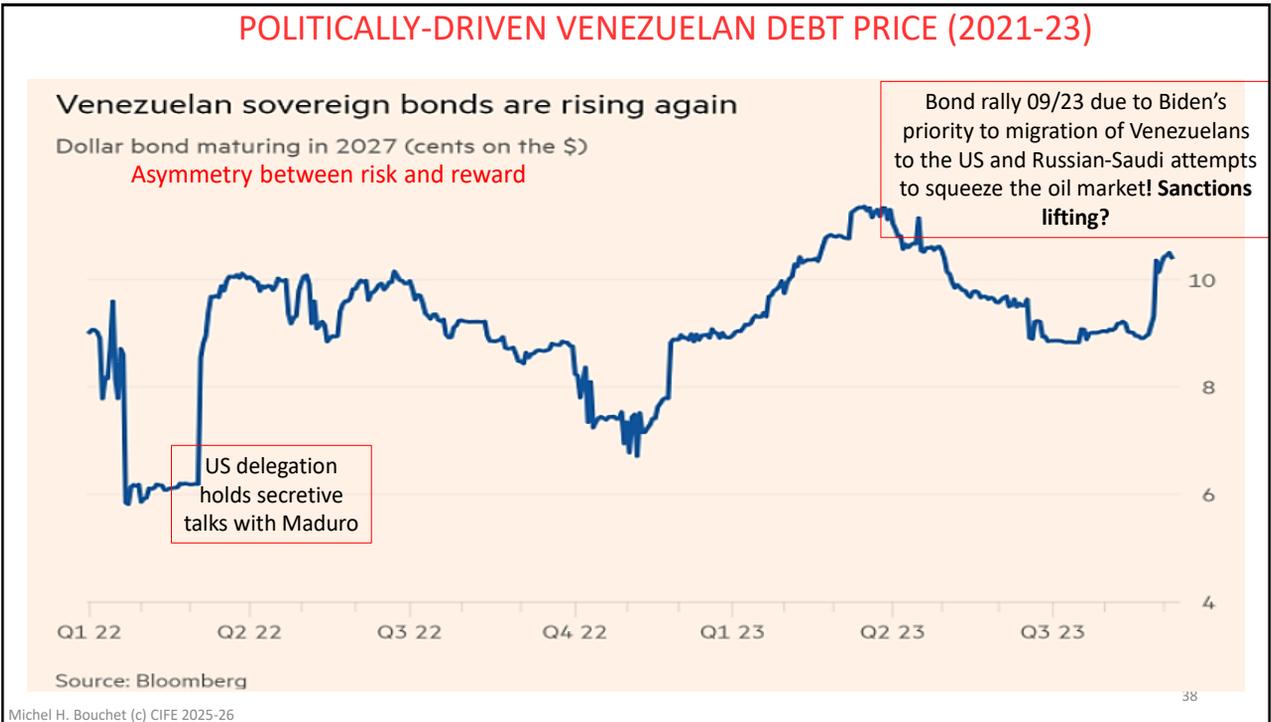


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BUT HOW TACKLING AN « ABNORMAL » RISK?
LARGE, ABRUPT, AND OUTSIDE THE STANDARD TOOLKIT OF RISK INDICATORS?



Gradual trend of mounting riskiness

- ▶ Liquidity indicators
- ▶ Solvency ratios
- ▶ Ratings and rankings
- ▶ Surveys and polls
- ▶ Behavioral change
- ▶ Institutional weaknesses
- ▶ Growth slowdown
- ▶ Inflation rise

= « Gaussian law »

Abrupt turmoil and crisis

- War
- Coup d'état and Revolution
- Pandemic crisis (Ebola, HIV, Covid-19)
- Commodity crisis
- Sharp Exchange rate devaluation
- Bank run
- Global virus contamination
- Debt crisis and default
- Nationalization & confiscation

= « Fat tails and Black swans »

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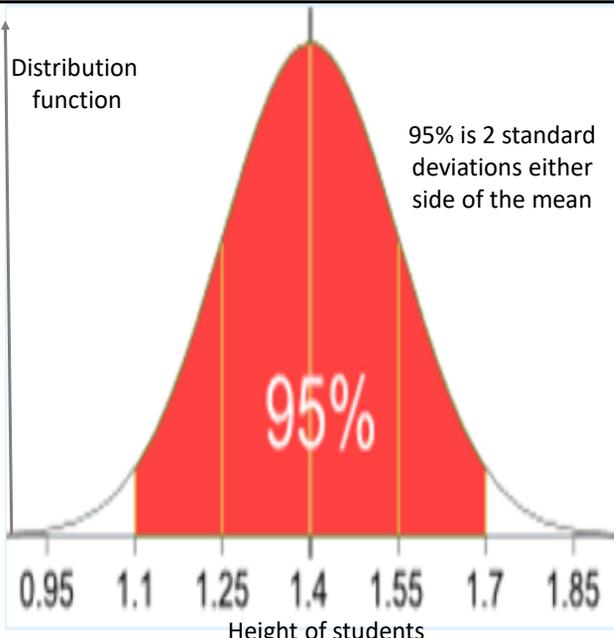
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BELL-SHAPED CURVE
NORMAL
DISTRIBUTION AND FAT
TAILS?

As the number of discrete events increases, the function looks like a normal distribution
 Values < one standard deviation away from the mean account for 68% of the set

Distribution function

95% is 2 standard deviations either side of the mean



Height of students
Solvency ratios
Current account deficits

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WHAT ABOUT RARE BUT CONSEQUENTIAL RISK AND FAT TAILS?

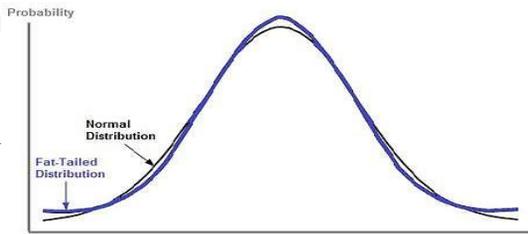
► Measuring average height

We select randomly two persons on earth and their total height is ... 4 m
 What is the most likely correlation between them??

► Measuring growth inequality within and between rich and poor nations?

We select randomly two persons on earth and their combined income is \$40 million: What is the most likely correlation between them?

Globally an additional 88 million to 115 million people fell into extreme poverty in 2020, a number that could rise to 150 million in 2021-22.



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FAT TAILS:
 OUTSIDE THE
 COMFORT
 OF THE
 « BELL CURVE »

Good morning Britain. This is what happened to your currency while you were asleep.

Sterling dives into uncharted waters
 Daily moves in the UK pound vs the US dollar (%)



Source: FT John Authers

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BLACK SWANS AND DRAGON KINGS

- **Nassim Taleb's Black Swans:** Major catastrophes are just events that started small and did not stop growing to develop into extreme sizes. These events are **unpredictable!** Black Swans are quantified by heavy-tailed distributions of event sizes ("fat tails" in Gaussian distributions). These outliers come from a small number of observations with a very large impact!



- **Sornette's Dragon Kings:** Very large in impact and born out of unique origins: non-linear systems. These **extreme events** are generated by herd-instinct, feedbacks, and unsustainable super-exponential acceleration before collapse. DKs are beyond the extrapolation of the fat tail distribution. Their occurrences **can be diagnosed ex-ante**, bringing back responsibility and accountability.

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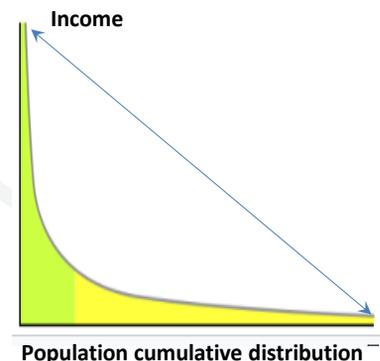
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POWER LAWS AND EXTREME RISKS?

Power law probability distributions = Functional relationship between 2 quantities, where a relative change in one quantity results in a proportional relative change in the other quantity, independent of the initial size of those quantities: one quantity varies as a power of another.

- Considering the area of a square in terms of the length of its side, if the length is doubled, the area is multiplied by a factor of four!
- Car exhaust is distributed according to a power-law among cars : very few cars contribute to most contamination
- Wealth gap and Pareto distribution: The net worth of Americans is distributed according to a power law with an exponent of 2 (the average income hides fat-tails!)
- Power-law distributions are plotted on doubly logarithmic axes, which emphasizes the upper tail region ("extreme events")
- Log-log plot and power-law graph of cumulative distribution of ranking of popularity: right= long tail and left= the few that dominate, also known as the 80-20 rule



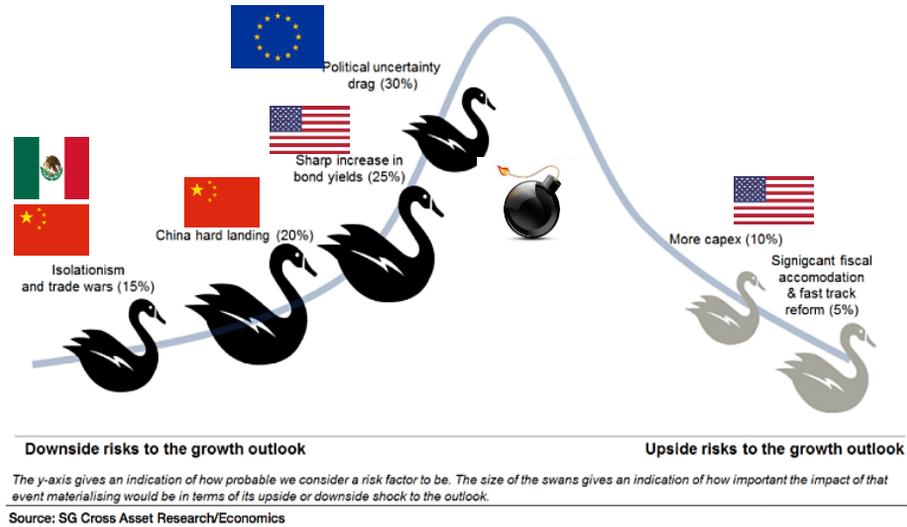
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HOW DOES A GLOBAL BANK LIKE SOCIETE GENERALE MEASURE THE RISK OF « BLACK SWANS »?

SG Swan Chart



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CONCLUSION

► Transforming information
into knowledge & economic intelligence =
Best risk mitigation strategy!

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Hello CIFE students! HELP!
I need a *quick* risk assessment of Italy vs Spain!

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COFACE + UNDP + TI + WORLD BANK= BETTER OFF IN ITALY OR IN SPAIN?



ITALY

- ▶ GDP Per capita ppp= \$43000
- ▶ HDI= 29
- ▶ Life expectancy f = 85,5
- ▶ Infant mortality= 3/1000
- ▶ Gender inequality: 0,07
- ▶ Doing Business= **58/190**
- ▶ Corruption = **52/180** ↑
- ▶ **Debt/GDP = 135%**
- ▶ **Unemployment = 6%**
- ▶ **Budget Deficit: -3%**



SPAIN

- ▶ GDP Per capita ppp=\$41000
- ▶ HDI= 28
- ▶ Life expectancy f= 86
- ▶ Infant mortality= 2,5/1000
- ▶ Gender inequality: 0,07
- ▶ Doing Business= **30/190**
- ▶ Corruption = **46/180** ↓
- **Debt/GDP 2025 = 103%**
- **Unemployment= 11%**
- **Budget Deficit = -2,7%**

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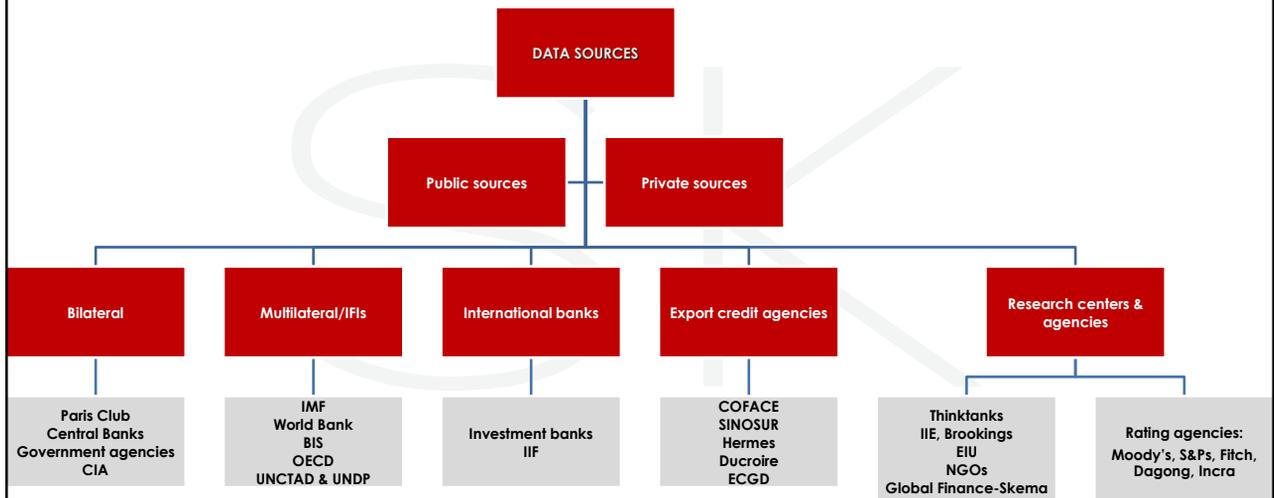
COUNTRY RISK ASSESSMENT IN AN AGE OF GLOBALIZATION?

Reliable and updated information
= Economic intelligence
→ **Robust risk analysis**



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MAJOR SOURCES OF COUNTRY RISK INTELLIGENCE



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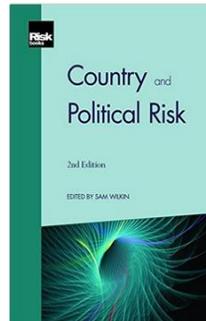
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INFORMATION SOURCES & ANALYSIS



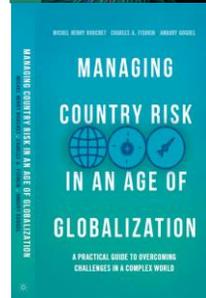
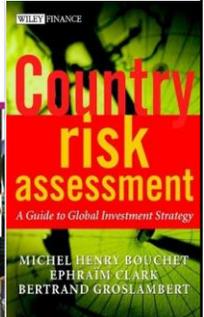
IMF, World Bank, IFC & MIGA
UNCTAD & UNDP
Fed Reserve Bk of St Louis
BIS, OECD, EBRD, EIB
Coface, Euler-Hermes
Moody's, S&P, Fitch, Dagong
Euromoney, Institutional Investor
CIA & US State Dept, ICRG
Transparency International
Hiscox, AON, Control Group
DEFI www.developingfinance.org



La globalisation

Introduction à l'économie du nouveau monde

Michel-Henry Bouchet



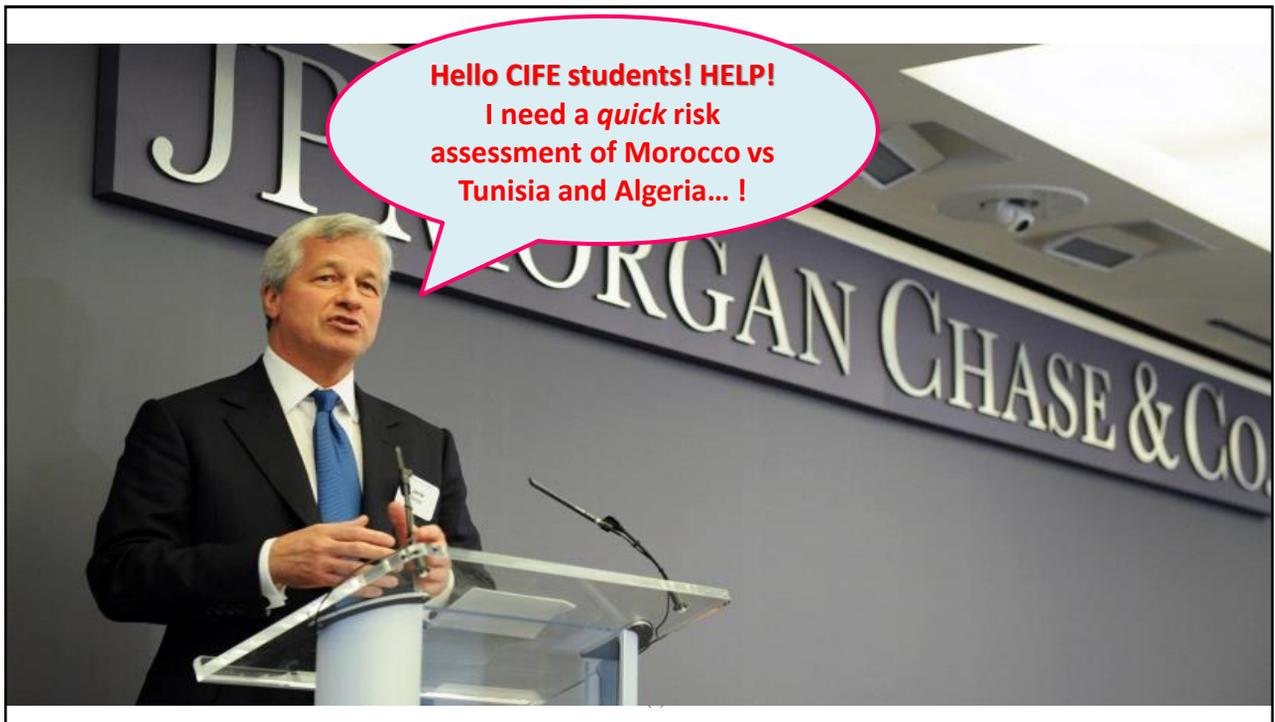
Control Risks



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COFACE + UNDP + TI + WORLD BANK= BETTER OFF IN TUNISIA, MOROCCO OR ALGERIA?



TUNISIA



ALGERIA



MOROCCO

- ▶ GDP Per capita = \$10700
- ▶ HDI= 101
- ▶ Life expectancy f = 75
- ▶ Infant mortality= 13/1000
- ▶ Gender inequality: 0,28
- ▶ Doing Business= **78/190**
- ▶ CPI Corruption = **92/180**
- ▶ **MDPov Index: 2,8% of pop**

- ▶ GDP Per capita=\$11800
- ▶ HDI= 93
- ▶ Life expectancy f= 76
- ▶ Infant mortality= 22/1000
- ▶ Gender inequality: 0,43
- ▶ Doing Business= **157/190**
- ▶ CPI Corruption = **107/180**
- ▶ **MDPov Index: 4%**

- ▶ GDP per capita ppp= \$8300
- ▶ HDI = 120
- ▶ Life expectancy= 73
- ▶ Gender inequality = **0,49**
- ▶ Infant mortality= **23,7/1000**
- ▶ Doing Business = **53/190**
- ▶ CPI corruption= **99/180**
- ▶ **MDPov Index: 11%**

UNDP: Pop vulnerable to multidimensional poverty

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