VAPOR

THE VAPOR ADVANTAGE

Putting a price on political risk

Willis

Oxford Analytica

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The Oxford Analytica Willis VAPOR (Value at Political Risk) model allows global companies to assess and compare the financial implications of exposure to a suite of political risks – in individual countries, regionally, or globally.

This capacity **does not currently exist** anywhere. Even a basic ability to compare the financial impact of political risk exposure, in real dollar-value terms and by industry, will give corporate risk managers and financial planners a competitive edge.

Companies that can estimate the cost of political risk contingencies over time to their underlying business operations will see a step-change improvement in their strategic planning and risk management processes, and can expect a lasting financial performance gain over time.

WHAT IS POLITICAL RISK?

Political risk is the threat posed to businesses by political upheavals or social change: common examples include expropriation or mass strikes. These events are significantly more difficult to manage than other business risks, such as exchange rate volatility, for two key reasons:

- they are *inherently unpredictable* – arising from complex, dynamic human societies
- they often have *catastrophic consequences* – as in the Argentine government's 2012 expropriation of YPF from Spanish multinational Repsol

Indeed, political risks can emerge in societies that have enjoyed stable business conditions for years; conversely, countries that have long been subject to severe internal violence can also see abrupt improvements in business conditions.

Simple trend assessments or data analysis (via 'big data') tend to have relatively little utility in gauging political risk over time.

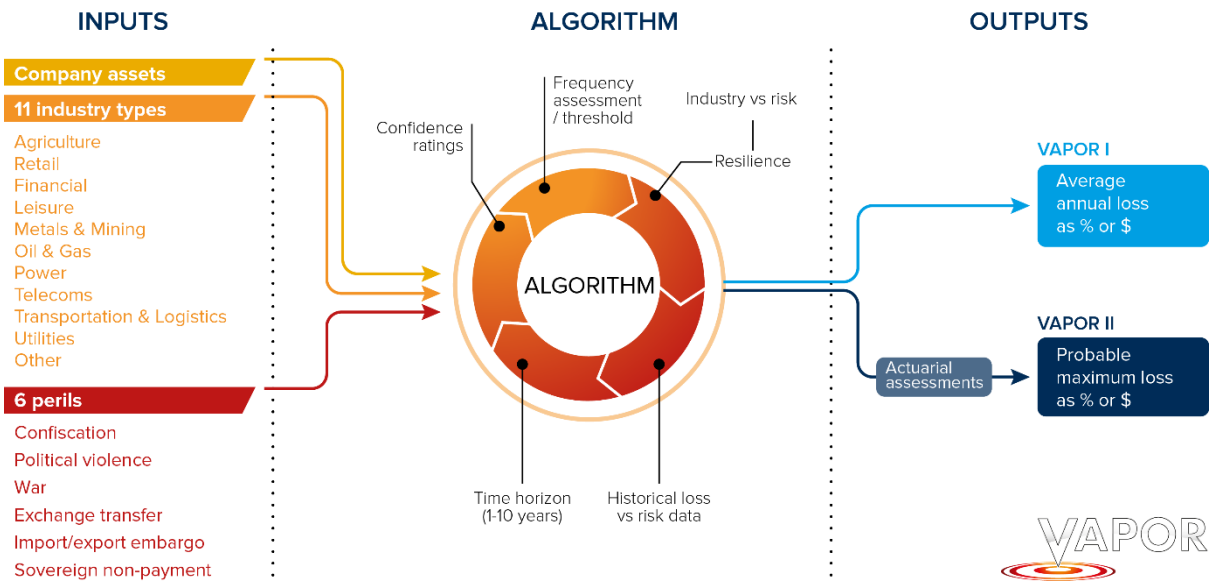
VAPOR offers a potential solution to this challenge – for the first time.

HOW DOES VAPOR WORK?

VAPOR was inspired by the catastrophe (cat) risk modelling industry, which for over two decades has allowed insurers reliably to estimate the financial impact – over time – of inherently unpredictable events such as hurricanes and earthquakes.

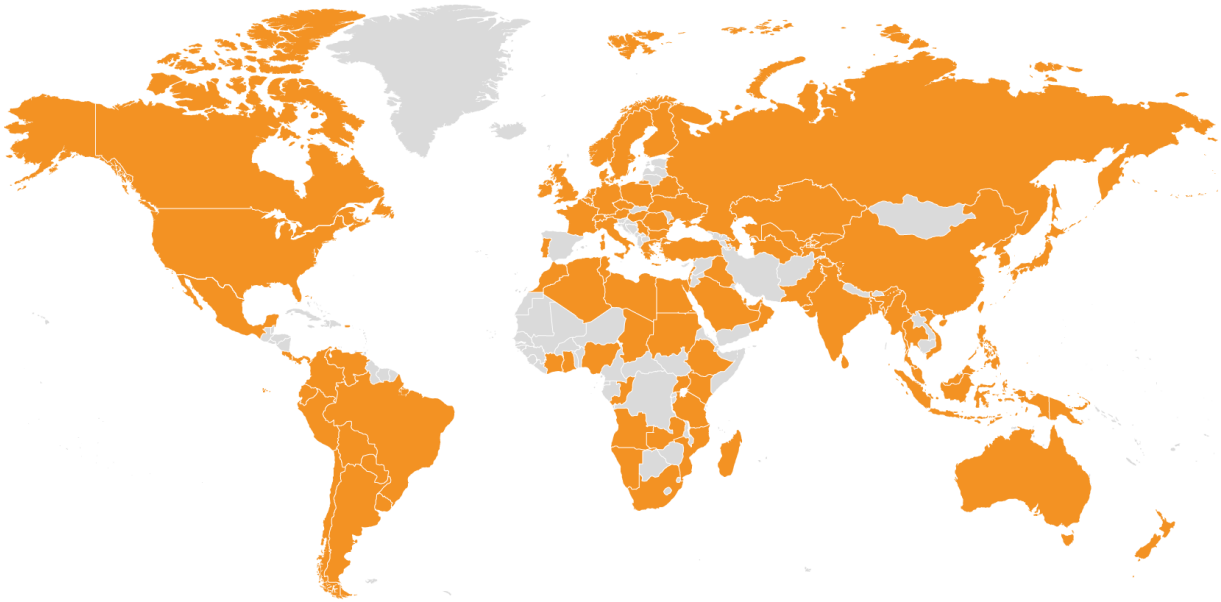
Using a proprietary approach, VAPOR takes historically validated qualitative analytical inputs and client asset data, and feeds them through a modified cat risk algorithm to produce a pair of expected loss estimates. These loss estimates are:

- **VAPOR I – Average Annual Loss (AAL)** – a reliable forecast of the expected cost of doing business for a generic industry type, in a particular jurisdiction, over a given time horizon.
- **VAPOR II – Probable Maximum Loss (PML)** – our best estimate of the cost of a serious 'tail risk' political contingency.



VAPOR takes a *probabilistic approach* to assess whether a particular society is more or less vulnerable to experiencing a suite of discrete political contingencies over time – and then estimates the possible cost, over time, of these contingencies to the business.

The VAPOR model covers six different political risk perils, across eleven different industry types, in 100 countries.

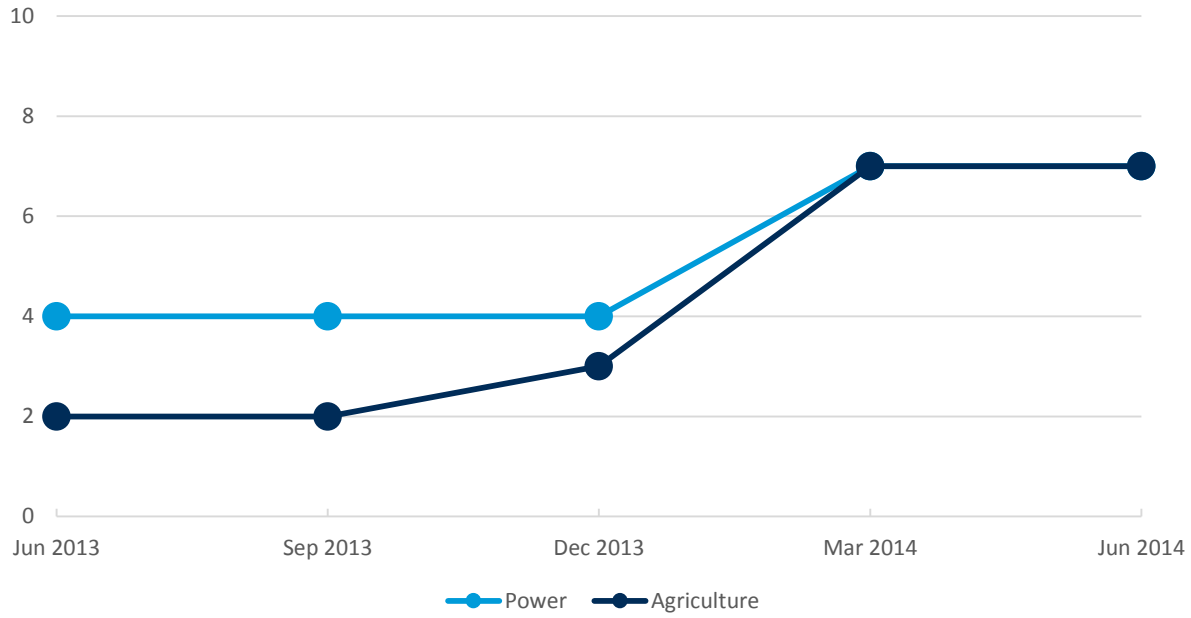


HOW ARE VAPOR'S QUALITATIVE ASSESSMENTS PRODUCED?

Oxford Analytica, a leading provider of global qualitative political risk analysis for over 30 years, provides the qualitative risk metrics and monitoring that feed the VAPOR model.

In producing these metrics, Oxford Analytica draws on a global network of over 1,400 academics, experts, and former government officials. The experts' analysis is then fact-checked, empirically tested, and vetted by a skilled internal staff of regional specialists using a methodology designed to increase accuracy.

Historical case of escalating risk: sovereign non-payment in Ghana



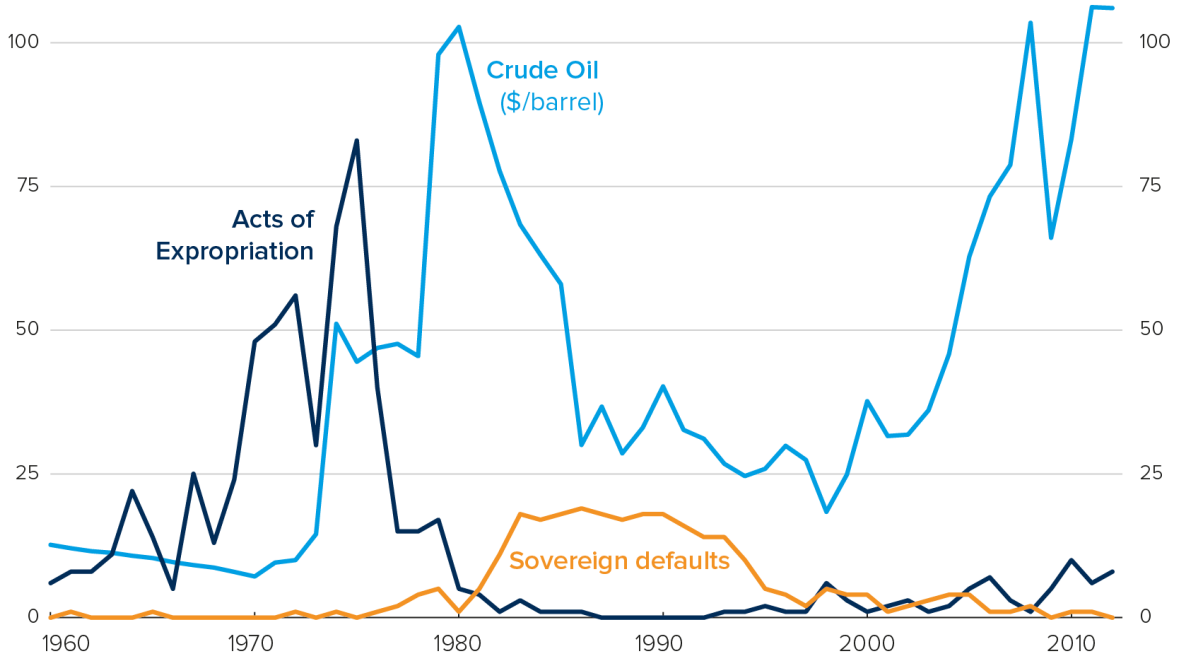
As with most classic cat models, Oxford Analytica's assessments provide several key inputs.

1. Frequency assessment

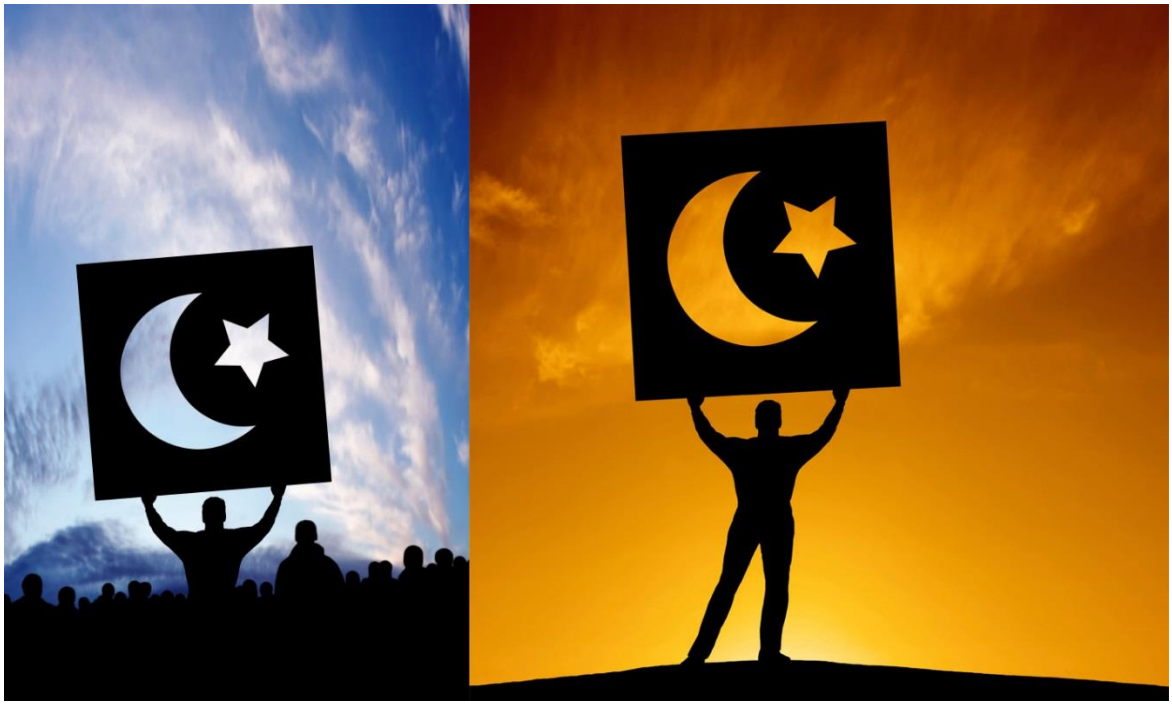
How often will a major risk contingency have a material impact on a particular industry, operating in a given jurisdiction?

This exercise involves both historical analysis and a non-linear assessment of the outlook for similar risk events over the time horizon in question.

Real crude oil prices set against expropriation, sovereign default perils



Societies and political economies change – for better or for worse – and sometimes very quickly, which sometimes makes past experience of limited use in risk assessment.



VAPOR frequency metrics are necessarily calculated using a *threshold assessment.* Even the best model cannot be relied upon to predict every minor contingency that may affect the bottom line for businesses in a particular sector. By focusing only on severe events that have a lasting, material impact on business conditions, the VAPOR model can be more accurate in its probabilistic assessments of the potential cost of political risk events to a business over time.

For example, peaceful protest movements that have limited economic effects would not 'trigger' the model – but mass demonstrations that block mining activity, would do so.

2. Vulnerability assessment

Oxford Analytica feeds the model with a vulnerability assessment, a historically derived assessment of business losses experienced in the face of certain kinds of severe political risks.

For example, expropriation events tend to generate exceptionally high losses, which often amount to the full value of the investment and expected future earnings. On the other hand, some industries can be relatively resilient in the face of capital controls.

3. Confidence assessment

The forecasts are finally calibrated through the confidence assessment, asking whether the society in question is subject to any potential foreseeable contingencies that might alter political risk conditions.

For example, if a country is facing an election that might bring a resource nationalist party to power, the team might reduce its confidence assessment regarding political risks confronting the mining or oil and gas sectors.

Confidence shifts are expressed in the VAPOR model by widening the upper and lower bands of expected dollar-value losses over time, and increasing the upper and lower range of the probable maximum loss estimate.

The research that feeds all three of these assessments takes account of the historical experience of the society or industry in question, and then makes judgments about whether such trends are likely to persist. Past is not necessarily prologue in political risk, so a simple assessment of the historical trend – or of current conditions – would often prove deceptive.

THE VAPOR QUANTITATIVE MODEL

Willis Analytics, a global leader in cat risk modelling, manages the VAPOR algorithm that produces the above mentioned outputs. The algorithm is underpinned by the approach taken by the cat risk modelling industry, which involves *probabilistically modelling the relative chances of a major negative event over time* – a strategy that has saved the insurance and reinsurance industries billions of dollars over the past two decades.

Cat risk modelling emerged due to a crisis in the reinsurance industry during the 1980s and early 1990s involving a spate of natural catastrophe-related losses: insolvencies became more common, confidence in the global risk industry dropped, capital withdrew from these markets and insurance became more expensive. Following the 26 billion dollars in losses inflicted by Hurricane Andrew in 1992 (chiefly in the southern United States), it was feared that private reinsurers would pull out of the storm damage industry entirely.

This did not occur, thanks to the advance in risk assessment science represented by cat risk modelling: the industry would go on to weather much more severe periods of losses without major insolvencies, including:

- 2005, with over 50 billion dollars in insured losses following Hurricanes Katrina, Rita and Wilma
- 2011's massive 350 billion dollars in insured losses (the highest loss in history, following Tohoku earthquake, Thailand flood and New Zealand earthquake)

Thanks to cat risk modelling, the reinsurance market was sufficiently capitalised to cover the enormous losses created by the Tohoku quake and tsunami, despite their unprecedented magnitude (Tohoku was the most powerful earthquake in Japanese history).

A key reason for this success is that cat risk models avoid the inherent bias of actuarial models, which are calibrated on historical losses, factoring in expected future frequencies and severities. VAPOR leverages these techniques (e.g. frequency/severity modelling, correlations, modelling uncertainty), with the added twist of qualitative risk assessments that change over time, sometimes abruptly, in-line with social and political change.

The VAPOR tool arrives at a particularly opportune time for global business, as multinationals move into new, higher risk jurisdictions and markets – and as a global commodity price correction stimulates new political volatility. Just as these advanced modelling techniques helped reinsurers manage an increase in extreme weather events 20 years ago, they can be a powerful aid to businesses seeking to manage today's political risk challenges.

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