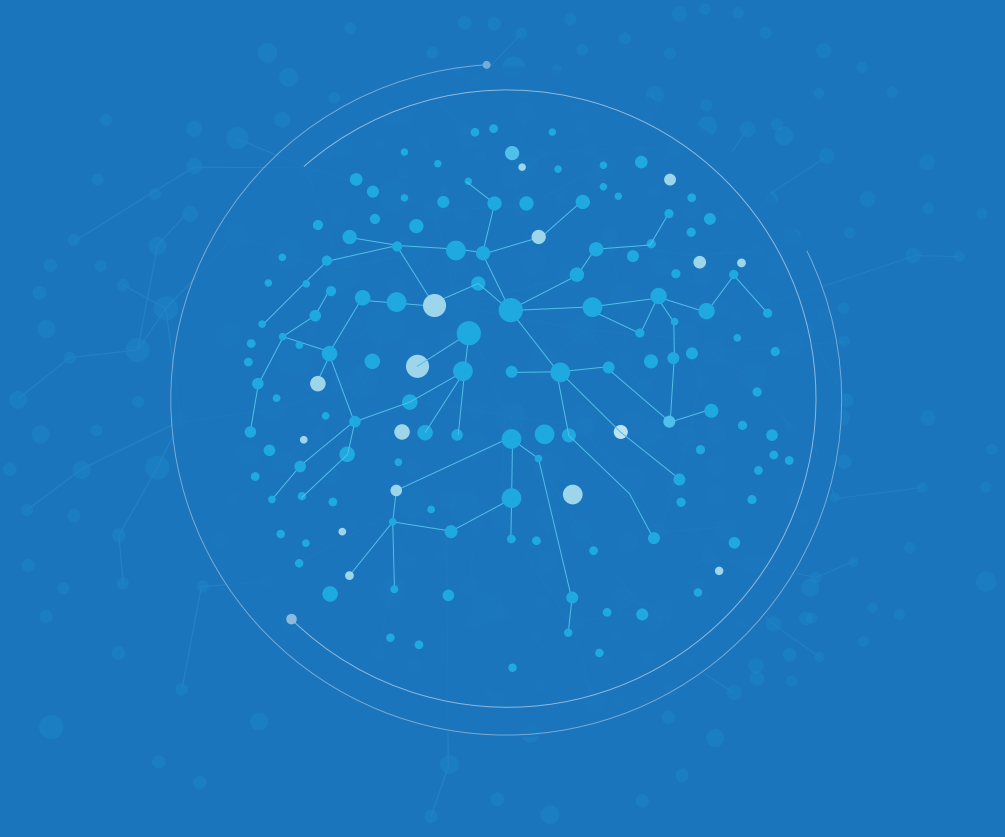
Institute for Economics & Peace
Advancing a systems-based approach to understanding and building peace

HALO, POSITIVE PEACE & SYSTEMS THINKING

- Analysing Societal Systems Using Halo
- Positive Peace & Ecological Shocks
- Systems Thinking & Peace Trajectories
- Understanding Country Intent



IEP Institute for Economics & Peace

Quantifying Peace and its Benefits

The Institute for Economics & Peace (IEP) is an independent, non-partisan, non-profit think tank dedicated to shifting the world's focus to peace as a positive, achievable, and tangible measure of human well-being and progress.

IEP achieves its goals by developing new conceptual frameworks to define peacefulness; providing metrics for measuring peace; and uncovering the relationships between business, peace and prosperity as well as promoting a better understanding of the cultural, economic and political factors that create peace.

IEP is headquartered in Sydney, with offices in New York, Brussels, The Hague, Mexico City and Nairobi. It works with a wide range of partners internationally and collaborates with intergovernmental organisations on measuring and communicating the economic value of peace.

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Please cite this report as:
Institute for Economics & Peace. Halo, Positive Peace and Systems Thinking 2024: Advancing a systems-based approach to understanding and building peace, Sydney, March 2024. Available from: http://visionofhumanity.org/resources (accessed Date Month Year).

Content

Executive Summary

The Institute for Economics and Peace (IEP) is dedicated to advancing the understanding of the operations of societal systems. To this end, this report brings together research conducted by IEP over the last decade and includes two conceptual approaches that are distinct but highly compatible: Positive Peace and *Halo*. These two concepts guide the organisation's research, mission, and theory of social change. In addition, the report covers other related work including attempts to measure national intent, predict future substantial declines in peace, and to measure societal shocks and resilience in relation to the ecology.

In the broadest sense, Halo refers to IEP's wide-ranging efforts to apply systems thinking to the measurement of the interrelated dynamics of peacefulness, development, and societal resilience. The term Halo captures the ways in which a systems-based approach encircles and illuminates all of IEP's efforts on these fronts.

Systems thinking, when applied to societies, encapsulates the dynamic and complex interactions of individuals, their networks, institutions, cultures, and environments, in which an incalculable number of component parts each play a role in shaping the overall functioning of the system. As a result, the interactions within a society are often nonlinear, self-organising, and self-regulating, involving feedback loops as well as emerging and sunsetting properties to name some, where changes in one part of the system can have cascading effects throughout the entire society. The functioning of a society can thus be analysed through the lens such concepts. Emergence, for example, can manifest itself in many forms, such as the invention of a new technology, the outbreak of war, the formation of a new political party, or the appearance of a new cultural norm. Similarly, self-organisation highlights a society's tendency to organically structure itself with or without explicit directives, leading to the establishment of social institutions, hierarchies, and cultural systems as individuals adapt to their environment.

Although societies can often be best understood through a holistic, systems-based perspective, the application of systems thinking to societal systems is still in its infancy. Halo helps fill this gap, as it focuses on mapping human systems to discover their dynamic evolution and develop approaches for change. This approach recognises the momentum and direction of societal systems, identifying them as either moving in virtuous or vicious cycles, influenced by stimuli and shocks. Halo offers a means to better understand these dynamics in order to redirect societal systems towards better outcomes.

In addition to this broad conception, Halo also refers to a specific, multi-step process for mapping and assessing specific systems within societies. The process combines concepts from systems thinking with stakeholder insights and quantitative data, employing both workshopping and computer-based modelling. It allows for the evaluation of system dynamics and the testing of potential interventions and their resilience to change. It illustrates how Halo can be applied in real-world scenarios, highlighting its practical effectiveness in analysing and modelling complex societal dynamics.

IEP's evolving work on Halo flows from its longstanding work in Positive Peace, a concept that originated in the quantitative analysis of the factors that create peaceful societies and then developed into a broader framework for societal advancement. In contrast to negative peace, which focuses on the outward manifestations of violence, Positive Peace is concerned with the underlying and interconnected factors – attitudes, institutions, and structures – that create and sustain peaceful societies. IEP's conception of Positive Peace in grounded in the eight Pillars of Positive Peace, which provide a comprehensive framework for understanding the elements that contribute to societal advancement and peace. What separates this body of work from others is that it is empirically derived, whereas most notions of peace are morally based. These Pillars form the basis of IEP's Positive Peace Index (PPI), which is composed of 24 indicators and ranks 163 countries, covering 99.7 per cent of the world's population, on their levels of Positive Peace. Each indicator was selected based on the strength of its statistical relationship with the Global Peace Index (GPI), IEP's measure of negative peace. Positive Peace thus represents both a goal toward which societies should aspire as well as a theoretical and a practical framework for measuring a society's resilience, peacefulness, and capacity to flourish. Positive Peace is also statistically associated with many other attributes that are considered desirable, including stronger per capita economic growth, better measures of wellbeing and happiness, and better ecological outcomes.

On this basis, the report explores how a systems-driven conception of Positive Peace allows for the prediction of countries' peace trajectory over the long term – specifically through the Positive Peace deficit model. Most countries with high levels of peacefulness also enjoy high levels of Positive Peace, and most countries with low levels of peace also have low levels of Positive Peace. However, this is not always the case, as some countries may exhibit high levels of peace but without the socio-economic development needed to sustain it. This manifests as a PPI rank that is materially inferior to its corresponding GPI rank.

Countries displaying this dynamic are said to have a Positive Peace deficit, and such deficits are strong predictors of future deteriorations in peacefulness. For example, of the 30 countries with highest Positive Peace deficits in 2009, 90 per cent recorded deteriorations in their GPI internal peace scores by 2023. Many of these countries lacked the social and institutional resilience to allow groups to resolve their grievances through non-violent means and to absorb negative shocks without resorting to violence.

The relevance of Positive Peace, systems thinking, and Halo are not limited to purely social systems; they also have applicability in humanity's relationships with the natural world. As such, this report also addresses the relationship between these concepts and a society's resilience to ecological shocks. It discusses how societies with higher levels of Positive Peace are better equipped to handle environmental challenges and disasters. When countries with high levels of Positive Peace do experience ecological shocks, they tend to suffer less and recover more quickly due to their higher levels of preparedness and adaptability.

The report concludes with an exploration of countries' unique "intents". It finds that countries, as collections of individuals and institutions, possess collective intents that are influenced by those in power and historical legacies. Relying on a methodology composed of four dimensions – political, economic, international relations, and social policy – the intents of countries are mapped on scales. Reflecting the insights advanced in both the Positive Peace and Halo frameworks, the analysis finds that, as countries become more developed, they become more alike in their intents across the four dimensions. Conversely, less developed countries tend to be more dissimilar, in that there are fewer countries that are close to each other on the intent scales. This highlights the importance of path dependence, a key concept in systems thinking, to the formation of national systems. Even where the destination of development is clear, each country's path of progress begins at a unique starting point.

INTRODUCTION

This report outlines the dynamics of the relationship between Positive Peace and systems thinking and how they operate – two complementary concepts which guide the research, mission, and theory of social change for the Institute for Economics and Peace (IEP). The report contains the summary of research conducted over many years into the dynamics of societal systems by IEP, the theoretical construction of Halo as well as providing an example of its use.

Toward this end, the report introduces Halo and Positive Peace, describing the positioning of the two bodies of work and how they can be used. Both Halo and Positive Peace are practical applications of systems thinking to the measurement and understanding of the interconnected dynamics of peacefulness, development, and societal resilience.

Positive Peace and Halo are complementary, but they provide different approaches to understanding and applying systems thinking to societal challenges. Positive Peace provides a measurement platform and actionable approach that can be used by any level of society to understand and alter societal systems, whereas Halo provides a theoretical understanding of how societal systems operate and how to map and model system changes and dynamics over time and under different conditions.

What is Positive Peace?

Much of the research into peace is focused on negative peace, which refers to the absence of violence or the fear of violence, and which is usually viewed in terms of cause and effect. In contrast, Positive Peace is defined as the *attitudes*, *institutions*, and *structures* that create and sustain peaceful societies, based on a systemic approach to the functioning of society[1]. The same factors that create peace also create many other outcomes to which societies aspire, such as thriving economies, higher levels of happiness and well-being, stronger social inclusion, and increased resilience and adaptability. Therefore, Positive Peace can be described as defining an optimal environment for human potential to flourish. It is also easily understood and therefore can be used by groups who do not have a deep understanding of systems theory.

Positive Peace refers to a state that arises out of a dynamic interaction of a wide array of societal forces and patterns of collective behaviour. As such, measuring peace and building peace necessitates an approach that takes into account the complex interplay of a range of social dynamics.

Positive Peace represents a holistic framework that encompasses a range of socio-economic, political, and cultural factors contributing to the overall wellbeing of a society. It recognises that there is never a single root cause of an issue, but rather a variety of drivers, and therefore many factors are needed to build resilient, peaceful and flourishing societies.

IEP's conception of Positive Peace in grounded in eight Pillars of Positive Peace, which provide a comprehensive framework for understanding the elements that contribute to sustainable and peaceful societies. These Pillars are: *Well-Functioning Government, Sound Business Environment, Equitable Distribution of Resources, Free Flow of Information, Good Relations with Neighbours, High Levels of Human Capital, Acceptance of the Rights of Others, and Low Levels of Corruption*. Each Pillar represents a critical aspect of societal development and cooperation that, when collectively strengthened, contributes to the establishment and maintenance of peace.

Changes in Positive Peace precede societal changes in peacefulness and other important measures of social wellbeing, for better or worse. Through building Positive Peace, a country, state, or community can improve its overall trajectory in social development and peacefulness. Systems-driven analyses oriented toward the goal of Positive Peace provides the roadmap to create better societal outcomes, either by strengthening virtuous cycles or by breaking vicious ones.

What is Systems Thinking?

Systems thinking represents a potent framework for analysing complex phenomena, offering a means to understand the networks of relationships within systems. Derived from the study of biological, ecological, and mechanical systems, the approach has been employed in fields ranging from business management to public health, from manufacturing logistics to urban planning, though for social systems, systems thinking is still in its early stages of development.

The strength of systems thinking lies in its capacity to reveal patterns, interdependencies, and feedback loops, and thereby model outcomes based on systemic interactions. It offers a particularly useful approach for understanding how changes in one part of a system can have flow-on effects throughout the system, allowing for more informed and forward-looking decision-making and policy-making.

This is facilitated by understanding that such systems have momentum and direction. They can be described as moving in virtuous or vicious cycles, with stimuli and shocks having cascading effects and social feedback loops amplifying the drivers of either progression or deterioration. By recognising the dynamics that lock systems into such cycles, the cycles can be redirected, either through small-scale nudges or larger-scale reforms, to produce better social outcomes.

Systems thinking is central to IEP's conception of Halo and Positive Peace. It represents a holistic approach to understanding and solving complex problems by assessing them in terms of interconnected wholes, rather than breaking them down into isolated components. It is a way of analysing the world which entails focusing on the connections between the relationships and flows of the components of the system to understand the dynamics of the whole.

What is Halo?

Recognising the great promise of systems thinking, IEP is dedicated to advancing this approach in the analysis of societal systems. IEP employs the term Halo in reference to its efforts to apply systems thinking across a wide range of projects and analyses. The term Halo is used to capture the ways in which a systems-based approach *encircles* and *illuminates* IEP's body of work on the functioning of societies, particularly in relation to the analysis of social progress, including peacefulness, development, and societal resilience. Central to the Halo approach is the mapping of human systems, with the view of discovering their dynamic evolution and developing a practical approach to defining change.

Much in the same way that the operations of the human body cannot be perceived directly, but rather through measurements such as heart rate, temperature, and blood pressure, the operations of societies also cannot be perceived directly. Therefore, the word Halo was selected to indicate that the data and values that emanate from a societal system sheds light on its underlying functioning.

To date there are few holistic frameworks that explain how societal systems operate, and fewer that can be implemented. Halo helps fill this gap, providing a unique and practical theory of social change. With Halo, IEP draws on its robust experience in employing data to measure multifaceted social dynamics to bolster the evidence base for social systems analysis.

In view of the depth of complexity and inherent unpredictability of human societies, IEP understands the limitations in extracting hard or immutable *facts* from social analysis of this kind. Therefore, its principal objective with Halo is to understand the key relationships that foster societal wellbeing and to glean actionable *insights* for the construction of more prosperous, resilient and peaceful societies.

The Halo Process

In addition to this broad conception of Halo, IEP has also developed a bespoke Halo process as a methodology to map and assess the functioning of specific systems within societies. Drawing on the direct knowledge of stakeholders from within these systems as well as available quantitative data on the systems, the *Halo process* combines workshopping and computer-based modelling to evaluate system dynamics, with the view of testing assumptions, potential interventions, and resilience to changes. This process is described in greater detail in Section 2 of this report.

WHY ARE POSITIVE PEACE AND HALO TRANSFORMATIONAL?

Positive Peace is a transformational concept because it shifts the focus away from the negative to the positive by describing the necessary conditions for peace and society to flourish. Due to its systemic nature, improvements in Positive Peace not only strengthen peace, but are also associated with many other desirable outcomes for society, such as higher GDP growth, better measures of wellbeing, higher levels of resilience and more harmonious societies. Importantly, it provides a theory of social change, explaining how societies transform and evolve. Positive Peace describes an optimal environment under which human potential can flourish.

A parallel can be drawn with medical science. The discipline of pathology has led to numerous breakthroughs in our understanding of how to treat and cure disease. However, it was only when medical science turned its focus to the study of healthy human beings that we understood what was needed to do to stay healthy: physical exercise, a good mental disposition, a balanced diet, and a sense of purpose. This could only be learned by studying what was working. In the same way, the study of conflict is different from the study of peace, producing very different insights. Understanding what creates sustainable peace cannot be found in the study of violence alone.

Humanity is nearing a tipping point and facing challenges unparalleled in its short history. Many of these problems are global in nature, such as climate change, ever decreasing biodiversity, depletion of the earth's freshwater, and overpopulation. Such global challenges call for global solutions and require cooperation on a scale unprecedented in human history. In a hyper-connected world, the sources of many of these challenges are multidimensional, increasingly complex and span national borders. For this reason, finding solutions requires fundamentally new ways of thinking.

Peace is the prerequisite for the survival of humanity in the 21st century. Without peace, it will not be possible to achieve the levels of trust, cooperation, and inclusiveness necessary to solve these challenges, let alone empower international institutions and organisations necessary to address them. In the past, peace may have been the domain of the altruistic, but in the current interconnected and highly mobile global society it is clearly in everyone's self-interest.

Positive Peace provides a framework to understand and address many of the complex challenges the world faces. It is transformational in that it is a cross-cutting facilitator of progress, making it easier for businesses to sell, entrepreneurs and scientists to innovate, individuals to produce and governments to effectively regulate.

Positive Peace is systemic and understanding systems thinking is required to grasp it in its entirety.

Halo describes IEP's approach to systems and how to evaluate them. Positive Peace and Halo are complementary approaches, with Halo describing the theoretical approach to understanding how societal systems operate and how to map them and Positive Peace providing a measurement platform and an actionable approach and goal for pursuing systemic change.

Systems thinking originated in the study of organisms and has been extended into sociology. A system is a set of parts that interact to achieve a desired purpose/function or intent.

Systems thinking can also assist in understanding the way countries function and evolve. When combined with Positive Peace, it provides new ways of conceptualising and explaining societal change. A system cannot be understood merely by breaking it down and analysing its constituent parts in isolation. Positive Peace consists of eight Pillars, but none of these Pillars correlates with negative peace as strongly as the sum of all components. This highlights that the whole is more than the simple sum of its components.

Such an approach contrasts with the traditional notion of linear causality, which dominates decision making today: identify a problem, decide upon its causes, and tackle them in isolation. Without a fuller understanding of the underlying system dynamics, the linear approach is often ineffective and creates unintended consequences. The failure to solve some of society's fundamental challenges is a testimony to this. Even when most people talk of societal systems, they lack a theoretical grounding in the way systems operate. This body of work is aimed at helping to address this gap.

In systems, relationships and flows are more important than events. Events or problems represent the outcomes of the relationships and flows. This is why it is important to look at the multidimensional concept of Halo as a holistic, systemic framework.

Positive Peace defines the goals that a system needs to evolve too. Halo explains the mechanisms by which a societal system operates. When attempting to improve the system, interventions should incrementally nudge the system towards ever higher levels of Positive Peace, rather than creating radical change, which is disruptive. Small changes from many directions stimulate many parts of a system and, if unsuccessful, have less impact and are more likely to be reversible. In contrast, large changes can fundamentally change the system making it impossible to correct the course.

Importantly, viewing countries as systems provides a framework for understanding the relationships between humanity and the broader systems, such as the atmosphere and biosphere, with which we intersect with and depend upon. Systems are self-regulating and self-modifying and operate on two levels: first as a collection of interconnected subsystems and second as part of the larger systems surrounding it.

Understanding these interdependencies is essential to meeting the global challenges of our age.

Different countries have different aims, or intent. Societies also have both formal and informal rules, referred to as encoded norms, which govern social behaviour, and serve to maintain the system in a stable state. They regulate inputs, creating feedback loops. This can be observed in many societal processes, such as when a government stimulates the economy in response to a drop in GDP or deploys more policing resources when there is a rise in crime. Each country's system will be unique, with different social norms and governance, although following the same general principles.

With the diversity in intent and encoded norms, any two countries may react differently to the same stimulus. Tipping points also occur within systems due to lagged and non-linear relationships. IEP's research uncovers evidence of tipping points in relation to peace and corruption, and peace and per capita income, to name just two examples. In the past, societies have been investigated through the lens of linear causality; in the future, embracing these holistic, systemic approaches will enhance our ability to navigate an age of unprecedented challenges.

Seen in this light, Positive Peace and Halo represent an overarching framework for understanding and achieving progress not only in the level of global peacefulness, but in many other interrelated areas, including better economic progress, better ecological performance, happiness, stronger development and social advancement, each of which has a robust statistical relationship with Positive Peace.

Positive Peace: A Measure of Societal Resilience

- Positive Peace is a gauge for societal resilience. Communities, societies and countries that operate with high levels of Positive Peace are more capable of protecting their populations against adverse shocks, such as economic downturns, political crises or natural disasters. These societies also tend to rebuild their internal structures and recover more rapidly in the aftermath of such shocks.

- Positive Peace is defined as the attitudes, institutions and structures that create and sustain peaceful societies. These same factors also lead to many other positive outcomes that society feels are important. Higher levels of Positive Peace are statistically linked to higher GDP growth, better environmental outcomes, higher measures of wellbeing, better developmental outcomes and stronger resilience.

- Positive Peace has been empirically derived by IEP through the analysis of tens of thousands of cross-country measures of socio-economic development, including surveys and expert assessments, to determine which have statistically significant relationships with actual peace as measured by the Global Peace Index (GPI).

- Positive Peace is measured by the Positive Peace Index (PPI), which consists of eight Pillars, each containing three indicators. This provides a baseline measure of the effectiveness of a country's capabilities to build and maintain peace. It also provides a measure for policymakers, researchers and corporations to use for effective interventions, design, monitoring and evaluation.

- Positive Peace can be used as the basis for empirically measuring a country's resilience — its ability to absorb, adapt and recover from shocks, such as climate change or economic transformation. It can also be used to measure fragility and help predict the likelihood of conflict, violence and instability.

1 Positive Peace, Systems Thinking and Halo

A system at its most simplistic level can be understood as a collection of components which interact together to perform a function. A simple example of this is a forest, comprised of individual components such as trees, grass, soil and fauna. Each of these individual components interact and share varying degrees of dependence with each other. The collection of the individual components and their interactions form the system and together, the interdependent system is more than the sum of the component parts.

In systems, the whole is much more than the sum of the parts and cannot be fully understood by describing its components individually. When thinking of complex systems and how this idea pertains to peaceful environments, it is not possible to simply isolate cause from effect because of the multitudinous ways in which different variables react to each other. Violence, governance, poverty, wealth, ecology, rule of law, and corruption are just some of the factors that determine societal outcomes.

Consider the example of an increase in the incidence and perception of corruption. This will undoubtedly have an effect on business, the functioning of government, and the free flow of information. But changes in corruption may also in part be caused by negative or positive changes in the very same variables. Alternatively, consider restrictions on the free flow of information and its impact on financial transparency, which thereby affects business, the functioning of government and the ability for individuals to engage in corruption. It is not possible to say that when certain attributes reach a certain level we will see certain outcomes, but rather that when one variable changes, others are likely to change as well.

Positive Peace as a term was first introduced in the 1960s by Norwegian sociologist Johan Galtung and has historically been understood qualitatively based on idealistic or moral concepts of a peaceful society. The distinguishing feature of IEP's work on Positive Peace is that it is empirically derived and therefore conceptually different from Galtung's version. Statistical analysis and mathematical modelling were used to identify the common characteristics of the world's most peaceful countries. It therefore forms an important evidence base to understand Positive Peace and avoids subjective value judgements. It is also associated with many other factors that are considered important: more wealth, higher levels of happiness, stronger ecologies, and better developmental outcomes[2].

To construct the Positive Peace Index, nearly 25,000 national data series, indexes and attitudinal surveys were statistically compared to the internal measures of the Global Peace Index to determine which factors had the highest statistical correlations. Indicators were then qualitatively assessed and where multiple variables measured similar phenomena, the least significant or indicators with the poorer data were dropped. The remaining factors were clustered using statistical techniques into the eight Pillars of Positive Peace. Three indicators were selected for each Pillar that represent distinct but complementary conceptual aspects. The index was constructed with the weights for the indicators being assigned according to the strength of the correlation coefficient to the GPI Internal Peace score. This empirical approach to the construction of the index means it is free from pre-established biases or value judgements. It is also highly robust. Various tests have been performed, including using alternative methods of weighting which have produced similar results.

Human beings encounter conflict regularly — whether at home, at work, among friends or on a more systemic level between ethnic, religious, or political groups. But most of these conflicts do not result in violence. Conflict provides the opportunity to negotiate or renegotiate to improve mutual outcomes[3]. Conflict, provided it is non-violent, can be a constructive process. There are aspects of society that enable this, such as attitudes that discourage violence or legal structures designed to reconcile grievances.

BOX 1.1

Measuring peace: the Positive Peace Index and the Global Peace Index

The Global Peace Index (GPI) is produced annually by IEP and ranks 163 independent states and territories according to their level of peacefulness and stands as the world's leading measure of global peacefulness. The GPI is composed of 23 qualitative and quantitative indicators from highly respected sources, covering 99.7 per cent of the world's population. The index measures global peace using three broad themes: the level of safety and security in society; the extent of domestic or international conflict; and the degree of militarisation. For the full 2023 report or to explore the interactive map of global peace, visit www.visionofhumanity.org.

The Positive Peace Index (PPI) measures the level of Positive Peace in 163 countries. The PPI is composed of 24 indicators that capture the eight Pillars of Positive Peace. Each indicator was selected based on the strength of its statistically significant relationship with the GPI. For more information and the latest results of the PPI, refer to Section 3 of this report.

FIGURE 1.1

The Pillars of Positive Peace

A visual representation of the factors comprising Positive Peace. All eight factors are highly interconnected and interact in varied and complex ways.

The Pillars of Positive Peace

IEP has identified eight key factors, or Pillars, that comprise Positive Peace[4]:

- ***Well-functioning government*** – A well-functioning government delivers high-quality public and civil services, engenders trust and participation, demonstrates political stability and upholds the rule of law.

- ***Sound Business Environment*** – The strength of economic conditions as well as the formal institutions that support the operation of the private sector. Business competitiveness and economic productivity are both associated with the most peaceful countries and are key to a robust *business environment*.

- ***Equitable Distribution of Resources*** – Peaceful countries tend to ensure equity in access to resources such as education, health and equity in income distribution.

- Acceptance of the Rights of Others – Peaceful countries enforce formal laws that guarantee basic human rights and freedoms and the informal social and cultural norms that relate to behaviours of citizens.

- ***Good Relations with Neighbours*** – Harmonious relations with other countries or between ethnic religious, cultural groups within a country are vital for peace. Countries with positive internal and external relations are more peaceful and tend to be more politically stable, have better functioning governments, are regionally integrated and have lower levels of organised internal conflict.

- ***Free Flow of Information*** – Free and independent media disseminates information in a way that leads to greater knowledge and helps individuals, business and civil society make better decisions. This leads to better outcomes and more rational responses in times of crisis.

- ***High Levels of Human Capita l*** – A skilled human capital base reflects the extent to which societies educate citizens and promote the development of knowledge, thereby improving economic productivity, care for the young, political participation and social capital.

- ***Low Levels of Corruption*** - In societies with high levels of corruption, resources are inefficiently allocated, often leading to a lack of funding for essential services, which in turn can lead to dissatisfaction and civil unrest. Low corruption can enhance confidence and trust in institutions as well as improve the efficiency of business and the competitiveness of the country.

IEP does not specifically set out what interventions should be carried out for each of the Pillars, as these will very much be dependent on cultural norms and development path of a specific country. What is appropriate in one country may not be appropriate in another. The ways in which *High Levels of Human Capital* or *Acceptance of the Rights of Others*, for example, manifest in each society will be unique to some degree. However, the composite scores for each Pillar capture the dynamics at play in each society.

What sets Positive Peace apart from other studies of peace is that its framework is empirically derived. The indicators chosen to measure each Pillar are based on the factors that have the strongest statistically significant with peacefulness and as such form both a holistic and empirical framework[5].

BOX 1.2

Characteristics of Positive Peace

Positive Peace has the following characteristics:

- **Systemic and complex:** progress occurs in non-linear ways and can be better understood through relationships and communication flows rather than through a linear sequence of events.
- **Virtuous or vicious:** it works as a process where negative feedback loops or vicious cycles can be created and perpetuated. Alternatively, positive feedback loops and virtuous cycles can likewise be created and perpetuated.
- **Preventative:** though overall Positive Peace levels tend to change slowly over time, building strength in relevant Pillars can prevent violence and violent conflict.
- **Underpins resilience and nonviolence:** Positive Peace builds capacity for resilience and incentives for non-violent conflict resolution. It provides an empirical framework to measure an otherwise amorphous concept: resilience.
- **Informal and formal:** it includes both formal and informal societal factors. This implies that societal and attitudinal factors are as important as state institutions.
- **Supports development goals**: Positive Peace provides an environment in which development goals are more likely to be achieved.
- **Underpins progress more generally.** Positive Peace also creates an environment of better performance for the environment, wellbeing, economic development and inclusion.

Implementing Positive Peace

IEP implements Positive Peace in communities around the world using two approaches. The first approach is predicated on Systems Thinking. It uses the concepts of societal systems to guide the design of intervention programs and organisations dedicated to building resilience in fragile regions as well as developed states. This approach is discussed in Section 3 of this Report. The Positive Peace framework has been used in over 1,000 projects globally and in over 50 countries.

The second approach uses targeted interventions through workshops and direct training to shore up resilience at the local community level. In some cases, these interventions engage The Charitable Foundation (TCF), IEP's sister organisation, which develops programs for communities to improve their physical infrastructure and become progressively self-reliant. This is discussed in Section 4 of this Report.

Halo and Systems Thinking

Systems theory first originated while attempting to better understand the workings of biological systems and organisms, such as cells or the human body. Through such studies, it became clear that understanding the individual parts of a system was inadequate to describe a system, as systems are much more than the sum of their parts. Extending this principle to societal systems is a paradigm shift, allowing for a more complete understanding how societies work, how to better manage the challenges they face and how to improve overall wellbeing. This approach offers alternatives to traditional understanding of change.

One of the clear distinctions between organisms and societies is that organisms have very clear physical boundaries. Societal systems, such as the education system, an ethnic grouping or health systems do not have clear boundaries. Other societal systems do, such as a country. Most countries have a concept of self-identity, where citizens see themselves as belonging to it, it has control over its territory with defined borders, and it can regulate and enforce laws[6].

All systems are considered open, interacting with the sub-systems within them, other similar systems and the super-system within which they are contained. A societal system is made up of many actors, units and organisations spanning the family, local communities and public and private sectors. As all of these operate individually and interact with other institutions and organisations, each can be thought of as their own open system within the societal system. Sub-systems may, for instance, include companies, families, civil society organisations, or public institutions, such as the criminal justice system, education or health. All have differing intents and encoded norms[8]. Similarly, a country interact with other countries through trading relations, regional body membership and diplomatic exchanges, such as peace treaties or declarations of war.

BOX 1.3

A Summary Of The Properties Of Systems[7]

These are some of the key properties of complex systems:

- **The system is a whole.** It cannot be reduced to its component parts. The simple aggregation or combination of behaviour patterns of individual parts is insufficient to describe the full operation of the whole. This is known as *systemic complexity.*

- **It is difficult or impossible to ascertain causality.** Given this systemic complexity, the notion of causality – so commonly used in traditional socio-economic analysis - loses meaning in systems thinking. Rather, systems' components are thought of as mutually determining one another.

- **The evolution of a system is path-dependent**. Systems have *memory*, in that they retain information about the path taken to reach a given state. For example, consider two countries now experiencing the same degree of peacefulness and social order. If one country has just emerged from a long period of internal conflict, while the other has always been peaceful, the first country will more easily be nudged into unrest and turmoil by a negative shock, as old rivalries and resentments flare up again.

- **The social system has intent.** The intent of a system is its willing pursuit of desired outputs or states. For example, the intent of a school system is to provide pupils with the best possible education through the most efficient use of resources.

- **The social system has norms.** Norms are patterns of conduct that members should or usually follow. Norms can change over time or in response to a disruptive shock. For example, the COVID-19 pandemic changed social norms about how individuals greet one another, congregate and work. Norms can also be expressed through the legal frameworks.

- **The system is self-regulating.** It aims to maintain a steady state by stabilising itself through feedback loops. The system adjusts to create balance between inputs, outputs and internally coded requirements. Feedback loops may lead to *virtuous* or *vicious cycles*, depending on whether the self-regulation mechanism places the system in states of greater or lesser peacefulness.

- **The system is self-modifying.** When there is a persistent mismatch between inputs and desired outputs, the system searches for a new pattern of operation. For example, a corporation that is consistently not achieving its profit goals, will modify itself by reducing or re-purposing the workforce, redesigning production processes or changing the product it manufactures.

- **The system does not operate in isolation.** Social systems interact with one another, for example as two countries interact through trade, economic investment, migration, exchange of knowledge and other means. Systems interact with other systems of higher or lower hierarchy, as for example, a city interacts with both the national 'super-system' and the household 'sub-system', as well as the household interacting with the state.

- **The system operates non-linearly and may contain tipping points.** The interrelationships among components of a system are often non-linear. That means the relationship changes depending on the level of development of a country. In some cases, relationships change more abruptly when certain thresholds are reached. These thresholds are called *tipping points.* For example, corruption and per capita income exhibit tipping points. Changes in corruption only have a small effect on the overall peace until a certain point is past, after which small changes have large impacts.and inclusion.

Figure 1.2 illustrates the different levels that are relevant to the country. It shows that the country state itself is made up of many sub-systems, including the individual, civil society, and business community. Scaling up, the country can be seen as a sub-system of the international community, in which it builds and maintains relationships with other countries and international organisations. Finally, the international community forms a sub-system of a number of natural systems, such as the atmosphere and biosphere.

It should be noted that any sub-system within the following diagram can interact with a super system at any level. For example, an individual can interact with the country to which they belong, other countries, the international community or the natural environment. Therefore, the systems are not hierarchical in structure, rather they co-evolve and change together.

Systems thinking offers a more complex view of causality. Causal thinking is generally used in problem solving — find the cause of the problem and fix it. Such an approach is useful for explaining discrete and well-isolated physical phenomena. However, when multiple variables are involved, it becomes increasingly difficult to identify a cause.

Through the mechanics of mutual feedback loops, systems thinking blurs the separation between cause and effect. A mutual feedback loop is where two interacting entities modify each other through feedback. Conversations and negotiations are good examples of mutual feedback loops. A further example can be observed in the relation between the *Free Flow of Information* and a *Well-Functioning Government.* Governments can regulate what information is available; however, information can also change governments. Both will respond to the action of the other. In systems thinking, a "cause" is seen not as an independent force, but as an input into a system which then reacts, thereby producing an effect. The difference in reaction is due to different encoded norms, or values by which society self-organises. The same input can have very distinct results in different societies.

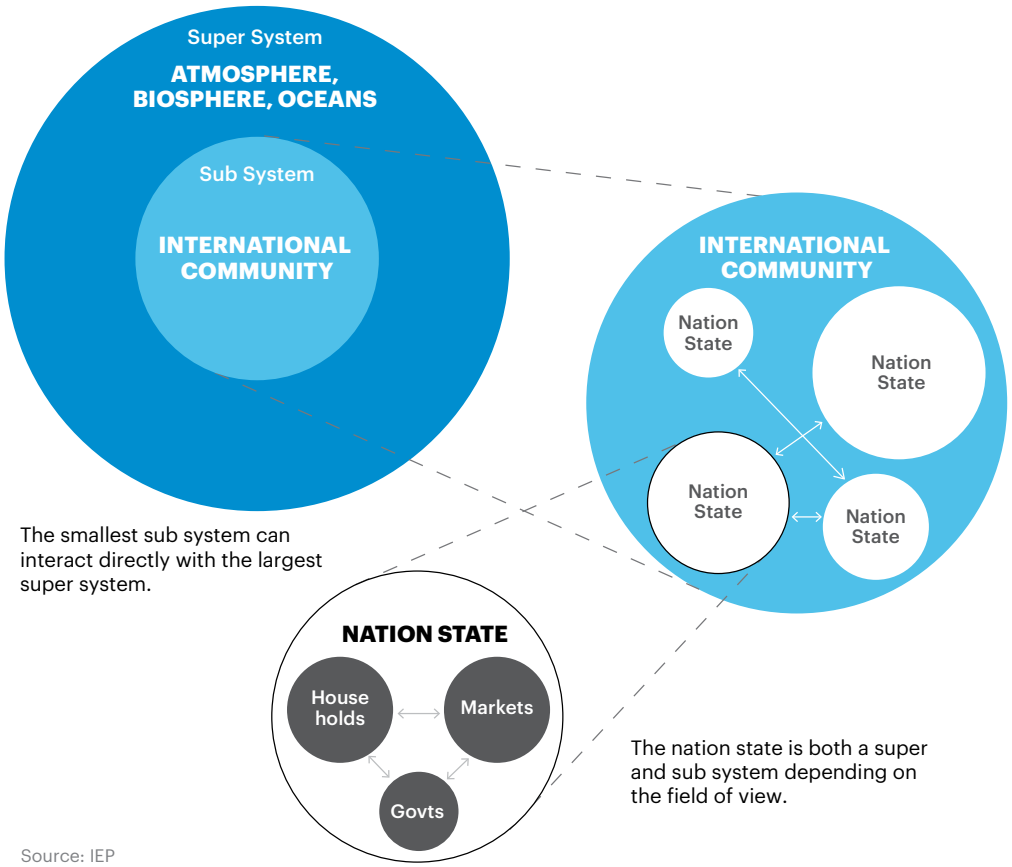
The concept of mutual feedback loops gives rise to the notion of causeless correlations and forms the basis of Positive Peace. Statistically significant correlations describe macro relationships, but the interactions within the dynamics of the system and the causal relationships will vary depending on the particular circumstances.

Furthermore, from a systems perspective, each 'causal' factor does not need to be understood. Rather, multiple interactions that stimulate the system in a particular way negate the need to understand all the causes. Processes can also be mutually causal. For example, as corruption increases, regulations are created, which in turn changes the way corruption is undertaken. Similarly, improved health services provide for a more productive workforce, which in turn provides the government with revenue and more money to invest in health. As conflict increases, the mechanisms to address grievances are gradually depleted increasing the likelihood of further violence.

FIGURE 1.2

Systems and countries

A country is both a super system and subsystem depending on the field of view. The smallest subsystem can interact directly with the largest super-system.



Source: IEP

Systems are also susceptible to tipping points in which a small action can change the structure of the whole system[9]. The Arab Spring began when a Tunisian street vendor who set himself[10] alight because he could not earn enough money to support himself. The relationship between corruption and peace follows a similar pattern. IEP's research has found that increases in corruption have little effect until a certain point, after which even small increases in corruption can result in large deteriorations in peace. Similar tipping points can be seen between peace and per capita income, inflation and inequality.

Causality

Causality works well in understanding the physical world and is the basis of empiricism. In the physical world, actions produce reactions that tend to consistent across time and environment – for example, throwing a ball into the air or boiling water. This stands in contrast to societal systems where the same input can result in a multitude of different reactions depending on context.

Inherent in our understanding of the world and the way we interact within it is the concept of causality. We take an action and expect an outcome. We are so attuned to this concept that it is built into our subconscious. In everyday life, physical actions have an effect that always results in the same outcome. Catching a ball or walking down the street, for example, involve a subconscious understanding of causality. The repeatability of certain scientific laws in terms of causality has enabled great strides in human progress, including in many of the engineering marvels of recent times.

Assumptions of linear causality, however, imply that all outcomes can be tracked back in a linear fashion to an initial condition. The idea that things are predetermined by a set of initial conditions leaves no room for genuine novelty, standing in contradiction to our experience of reality. Linear causality is useful for explaining discrete and well-isolated physical phenomena but when multiple variables are involved it becomes increasingly difficult to truly understand the cause.

The difficulty in applying linear causality to human beings, and by extension societies, is best explained through an example. In a conversation, linear causality would imply that the same words would have the same effect on whomever they are spoken to. However, this is clearly not the case. Take, for example, the words that are written here. Read by three different people, each could interpret them differently due to a number of factors, including their background knowledge, what they may think of the writer, or even their moods on the day. This will naturally affect their interpretation of the text and any subsequent actions related to the text.

This simple example clearly shows how individual human reactions can be unpredictable. The problem of linear causality is compounded when it is extended to social systems. One set of actions in one place will result in very different outcomes in another, even in the same country. Due to the differences in cultural norms, a speech given at a political rally in Canada and the same speech delivered in North Korea would garner different reactions.

To account for this, systems thinking offers a more complex view of causality through the mechanics of mutual feedback loops. In such a view, the separation between cause and effect is blurred. A mutual feedback loop is where two interacting entities modify each other through their feedback. A conversation or negotiation are good examples of mutual feedback loops. A further example can be observed in the relation between the free flow of information and a well-functioning government. Governments can regulate what information is available; however, information can also change governments. Both will respond to the action of the other. In systems thinking, a "cause" is seen not as an independent force but as an input to a system which then reacts, producing the effect. The difference in reaction is due to different encoded norms, or values by which society self-organises.

Homeostasis and Self-Modification

Homeostasis is the process by which systems aim to maintain a certain state or equilibrium. An example of this is the self-regulation of the body temperature of a mammal. If the body starts to overheat, then it begins to sweat; if the body becomes cold, then the metabolism will become faster. The system attempts to make small adjustments based on the way inputs are interpreted by its encoded norms so that future inputs are within acceptable bounds. The same model of understanding can be applied to countries. Countries maintain homeostasis through their encoded norms, such as accepted levels of social behaviour. Even the social norms around queuing can be seen as maintaining an equilibrium. Another example would be governments raising taxes to fund services to a particular level. Tax rates are more or less kept the same, with the budgets for government departments only changing gradually. We expect the health and education systems to behave in certain way.

One of the key differences between natural systems, such as the weather or the oceans, and biological systems is that biological systems have intent. Similarly, countries also have intent. For example, when Costa Rica abolished its military in 1948, the government at the time arguably had the intent not to go to war[11].

Encoded norms can also create mutual feedback loops. When the input comes into the system or is created by the system, the response may attempt to alter future inputs to maintain a steady state. Think of two groups who are continuously modifying their responses based on the actions of the other, such as two football teams who are continuously modifying their tactics based on the interactions in the game. In a democratic country, this continual change based on the actions of the other can be observed in the interactions and adjustments between two political parties, or the shaping of news based on public sentiment. The sentiment shapes the news, but the news also shapes sentiment.

Systems can modify their behaviour based on the input that they receive from their environment. For example, the desire to seek food when hungry or the release of T-cells in response to infection are encoded reactions to inputs. For countries, as inflation increases, interest rates are raised to dampen demand. When an infectious disease outbreak occurs, medical resources are deployed to fix it.

Feedback loops provide the system with knowledge of its performance or non-performance in relation to its intentions.

Given this, it is possible to analyse political systems through their feedback loops to understand how successfully they may be performing. An example would be measuring how political organisations respond to stimuli and whether the organisations' encoded norms create appropriate responses. Similarly, social values can be better recognised using the mutual feedback model. For example, the mutual feedback model can help us understand what behaviours are shunned and what behaviours are encouraged within a society and why.

When unchecked or operating in isolation, feedback loops can lead to runaway growth or collapse. In cultures, their role can be constructive or destructive. However, feedback loops are fundamental in promoting self-modification, which allows the societal system to evolve to a higher level of complexity. The effect of mutual feedback loops can be the accumulation of capital, the intensification of poverty, the spread of disease or the proliferation of new ideas.

If the external or internal factors of the societal system pressure the system into persistent imbalance, then a new level of complexity needs to be developed to maintain stability. Within the biosphere, it could be the mutation of a species so its offspring are better adapted to their environment. For a country, this may take the form of major shifts within the system, such as policies to reduce carbon emissions when CO_2 emissions become too high or the implementation of an anti-corruption commission when foreign investment falters.

Successful adaptation to systemic imbalances is more likely when the societal system has higher levels of Positive Peace. This is empirically demonstrated through the relationship between high Positive Peace and the reduced impact of shocks. For example, increases in the population of a country place stress on agricultural resources. The country can respond by implementing measures that improve the yield of the available land, while building an export industry to produce capital for the importation of food. Without an adequate response, the system would slowly degrade and potentially lead to collapse.

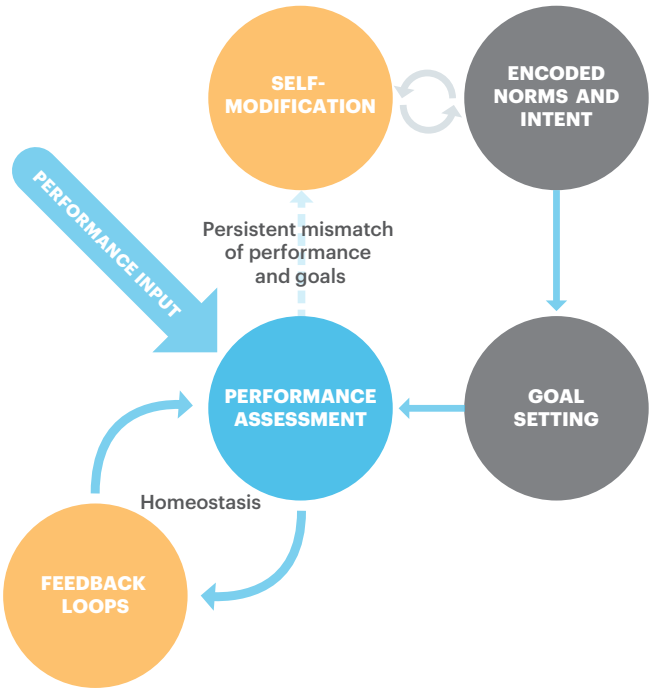
Figure 1.3 shows the process for homeostasis and self-modification. Encoded norms and intent set the goals for the societal system. The performance of the country in relation to its intent and encoded norms is then assessed by receiving either internal or external input. When the societal system is fulfilling its intentions, the feedback loops make minor adjustments to maintain homeostasis. However, when the societal system's performance is persistently mismatched to its intent, it can begin a process of self-modification. This allows the system to adjust its encoded norms or intent so that it adapts to the new conditions. Though Figure 1.3 depicts this process using a simple process diagram, in reality, these mechanisms are complex and dynamic.
The relationship between the country and other systems, such as the biosphere and atmosphere, is key to the survival of humanity. If these systems become incapacitated, then countries are also weakened. Similarly, acknowledging the interdependence between countries and other systems should fundamentally alter the way in which we handle these complex relationships.

When applying systems thinking to societal systems, it is important not to overcomplicate the analysis. What is essential is viewing the system as a set of relationships, rather than a set of events, and to understand the most important feedback loops. Halo provides a framework through which we can understand and approach systemic change, moving from simple causality to holistic action.

FIGURE 1.3

Homeostasis and self-modification

Homeostasis occurs when there is balance between a system's internal goals and its performance. If performance persistently is not matched to the societal system's goals, it will self-modify and adapt. Once this change has occurred, the societal system will redefine its goals and attempt to maintain the new homeostasis.



Source: IEP

2 How to Analyse Societal Systems Using Halo

IEP has developed an integrated approach to analysing societal systems built off the principles and framework of Halo. The Halo process has been designed to be both practicable and comprehensive, allowing for the modelling and analysis of the behaviours and processes of specific components and subsystems while ultimately focusing on the overarching dynamics of the totality of a system. The process takes a building block approach, which enables users to mix and match different steps depending on their preferences, the type of analysis being undertaken and the level of detail it requires.

One of the challenges with most approaches to analysing systems are that they are resource intensive and present difficulties in rendering actionable insights. Therefore, rather than studying complex systems in their entirety, researchers and stakeholders often seek to assess or address the dynamics of specific components. While breaking down and evaluating systems based on their parts can make analysis more manageable and exact, such an approach can also result in a fragmented perspective. This approach may obscure the true drivers and outcomes as well as unintended flow-on effects of potential interventions. The Halo approach combined with Positive Peace, therefore, aims to produce insights and relevant interventions in view of the entirety of a system.

The process involves mapping and gathering data, through which a system's interactions and flows are captured, simulated, and probed using a combination of stakeholder analysis and systems dynamics software. This process allows for the identification of the factors that create stability or instability within societal systems.

The process is grounded in systems thinking, and the process also employs the methods and techniques of *system dynamics* to model the behaviour of systems over time.

While closely aligned with systems thinking, system dynamics takes the extra step of utilising simulation to explore the effects of intentional interventions and unexpected external changes. System dynamics is both a methodology and a mathematical modelling technique aimed at framing and evaluating intricate problems and challenges. Its foundation lies in recognising that a system's structure is composed of numerous interlocking and sometimes time-delayed relationships that often hold equal or greater importance in shaping behaviour than the system's individual components.

The strength of the Halo process is that it brings together and harmonises five key pathways to achieving a better understanding of social systems and to finding solutions to problems within them:

1. **Identification:** The process begins by clearly defining the question that the analysis will aim to answer, without which the process can become too wide ranging, leading to over-complication and the inability to produce practical outcomes.

2. **Deliberation:** Drawing on stakeholders' direct knowledge of a system, the process is grounded in a structured exercise of collective reflection and mapping of the bounds, key components, and connections within the system. This includes the identification of subsystems within it.

3. **Theory:** Deliberations are guided by the Halo conceptualisation of how societal systems function and operate.

4. **Numbers:** Before and during the deliberative process, hard data and informed best estimates are generated about the stocks, flows, and conditional relationships within a system.

5. **Modelling:** Based on the system mapping and figures settled on during theory-guided deliberations, the techniques of system dynamics modelling are employed to test assumptions, refine understanding of the relationships within the system, and simulate the impacts of potential interventions and unforeseen shocks.

This section is divided in four parts:

- The first part describes the key concepts for developing a schematic representation of the features and dynamics of a system. These concepts are referred to as building blocks, or system attributes, and are defined along with examples.

- The second part provides an overview of the three phases of the Halo process, comprising an initial stakeholder workshop phase, a system modelling phase employing system dynamics software, and follow-up stakeholder workshop phase for probing and understanding potential interventions.

- The third part delves into a process of mapping a system and its attributes. Fourteen steps are outlined in this process, with the first ten corresponding with the initial workshop phase of the Halo process and the last four corresponding with the post-modelling phase. However, these 13 steps do not represent a fixed approach, as steps can be added or subtracted depending on the requirements of the analysis.

- Finally, the fourth part of this section describes a sample application of the Halo process applied to a real-world societal system: a local criminal justice system.

Conceptual Building Blocks for Systems Analysis

This section represents a summary of the key conceptual building blocks for engaging in the Halo process. It provides short definitions and explanations of constructs and ideas from systems thinking necessary to develop a schematic representation or model of a societal system within the Halo framework.

System Bounds

Systems have boundaries. These boundaries can be described according to a geographic area or social grouping. For example, a system can be defined by a geographic area, such as a country, a state, or a forest. These types of geographic boundaries are the easiest to define. It is more difficult if the system is an ethic group or a societal function. Social functions include the education system, military, policing, or a local health system. It is best to approach these as simplistically as possible at first. Some questions that help are: what are the subsystems which lie within the system, and what are the legal frameworks affecting the system? For example, the health system consists of hospitals, doctors, pharmacists, government health departments, psychologists, etc. For the analysis, it may not consist of alternative medicines, aged care homes or psychic healers. Sometimes it is helpful to stipulate what is not included in a system, as it makes for a simpler analysis.

Often relations and flows can be confused as systems, for example a conflict is an exchange between two or more systemic groups. A conflict is not a social system, but a series of relationships and flows between systems.

Subsystems

Systems do not exist in a vacuum, as they form parts of larger systems. For example, states are systems that form part of a larger national system. However, they also include systems, such as education, policing, business associations and others. Identifying the core systems, or subsystems, within the greater system provides the basis for understanding its dynamics.

To determine the importance of a system, consider the number of people within it, the number of people affected by the system, the amount of money revolving within it, the number of relationships or the extent of the laws or regulations prevailing in or governing the system.

Interrelated Systems

Systems interact with other systems. This could be an adjacent country, or district. It could be another ethnic group or an area of governance. For instance, the military, the police, the judiciary, and border control can all be seen as systems that interact with one another to achieve a certain objective. Another example could be a school which interacts with families, the education department, and local leaders to improve literacy rates in a community.

Direction or Momentum within a System

Momentum is important as it helps explain the changing dynamics of the system or subsystem, including emergence, runaway feedback loops, decay, and positive functions. The data can be assessed individually or grouped. By grouping the data, the momentum of the overall system or subsystem can be ascertained. An example of this would be the Positive Peace Index, as it measures national systems and can be used to determine the momentum of a country, either towards or away from higher levels of functioning.

It is also beneficial to compare measures of a system to those of its neighbours. This gives insight into a system's relative strengths and weaknesses, as neighbouring systems should be the most similar. For example, countries on a given continent would likely be more comparable to each other than to countries on the other side of the world, and schools in the same district would likely be more comparable than those on different sides of the country.

Momentum is an important concept for systems analysis because it facilitates the extrapolation or forecasting of future states the system may find itself in. If those states are undesirable – according to the intent of the system – interventions should be designed to slow down and possibly invert the system's momentum in that area. Where the extrapolated future state is desirable, programs can be developed to reinforce a specific momentum and take advantage of it to nudge its subsystems into higher states of development.

Path Dependencies

Systems are path dependent. This means that the way a system will develop in the future from a given state depends on the path taken to reach that state[12]. Path dependency can be understood as the influence that a social system's history, memory, and cultural values exert on the future development of that society. These influences are expressed in the encoded norms within the system.

Encoded Norms

Encoded norms refer to the formal and informal rules within a society which govern collective behaviour, often helping to maintain the system in a stable state. They are sometimes codified in laws, rules, or regulations. By determining how the people and institutions within a society respond to internal and external stimuli, encoded norms serve to establish tolerance thresholds for different social phenomena. This can be observed in many societal processes, such as when a government stimulates the economy in response to a drop in GDP or deploys more policing resources when there is a rise in crime. Each country's system will be unique, with different social norms and governance patterns, even when they follow the same general principles.

Isolating the main encoded norms within a system and the bounds within which they operate provides an understanding of the mechanisms that hold the system together. The encoded norms can sometimes be very subtle and difficult to quantify and therefore it is important to focus on the important ones.

Homeostasis States

All systems seek a steady state, which is a state of minimal change in the system's components, stocks, and flows. In the same way the human body seeks to maintain a core temperature, or regular heart beat societal systems also seek stability. Encoded norms are crucial in maintaining a steady state as they determine the corrective actions when inputs are outside acceptable bounds determined by the encoded norms. Systems also have a tendency to grow. The steady state can be one in which the system achieves growth; however, homeostasis can also cause stagnation. This can vary by subsystem.

Feedback Loops

A feedback loop is a key concept that refers to the dynamics within a system whereby an output is fed back into the system to alter, accelerate or dampen the input, thereby influencing future output. There are two main types of feedback loops: reinforcing and balancing.

Reinforcing feedback loops serve to amplify the effect of the input, potentially leading to exponential growth or decline within the system. If determinantal to the system, then they are referred to as runaway feedback loops. A reinforcing feedback loop might be population growth. As healthcare improves so does life expectancy, leading to a higher population. If unchecked, such growth can become a runaway feedback loop, leading to environmental degradation, more competition for resources and heightened conflict. Emergent properties within a system gain traction through reinforcing feedback loops. An example would be the emergence of the social media, where individuals gain positive feedback from associates, causing them to increase their usage of the technology. Sometimes there may be multiple steps in a reinforcing feedback loop. As more people use social media, more internet bandwidth is required, which in turn drives faster and cheaper services, thereby causing an even greater uptake of social media.

On the other hand, balancing feedback loops are those in which the outputs mitigate the effect of the inputs. In these cases, an initial change or perturbation will trigger responses that work to offset the deviation from a desired state, preventing the system from veering too far from equilibrium. In the case of population growth, a balancing agent might be the adoption of a new technology, birth control, to bring the population back to manageable size. Other examples of balancing feedback loops are companies hiring more staff as their work expands, more arrests and jails being built as crime increases, interest rates increasing as inflation exceeds a certain threshold, or electoral boundaries changing as an area's population and demographics change.

Tipping Points

A tipping point refers to a permanent and irreversible change in the state of a system. Tipping points are thresholds beyond which non-linear change occurs within a system and its dynamics are substantially reconfigured. These changes can happen quickly and can be dramatic, resulting in new or restructured relationships within the system.

It is hard to predict the timing of tipping points. Often an input can cause little change within a system until a particular moment, after which small inputs can cause substantial changes. For example, levels of corruption and per capita income exhibit tipping points. Changes in corruption only have a small effect on the overall peace until a certain point is past, after which small changes have large impacts.

Tipping points can be positive, when they lead to higher levels of societal resilience, or they may be negative, resulting in degraded systems. Identifying past tipping points can give insight into the dynamics which created the current system. Identifying exactly when a system may go through a future tipping point is extremely difficult. Therefore, understanding past system tipping points may shed light on possible future ones.

Often negative tipping points occur when a shock on a system breaks its resilience, causing the system to reconfigure. Examples are food shortages leading to conflict or increases in international interest rates causing a country's debt to become unserviceable and its currency to collapse. Positive tipping points can occur when per capita income passes a certain level, because of improvements in governance and business efficiency leading to a period of rapid economic expansion. Another example would be the take-up of a new technology, such as social media, leading to an expansion of human interactions and connectivity.

System Resilience and Adaptability

System resilience and system adaptability are two key concepts that address the ability of a system to respond to and navigate through disturbances or changes. System resilience refers to the reactive capacity of a system to absorb shocks, disruptions, or changes and still maintain its essential functions and structure. Resilient systems often feature redundancy, flexibility, and the ability to self-organise in response to challenges, ensuring they can absorb disturbances and continue to function effectively. System adaptability, on the other hand, focuses on a system's capability to proactively adjust and modify itself. In response to changing conditions, adaptable systems learn and evolve to enhance their performance by reconfiguring structures, processes, and functions. A highly adaptable system manages change, using it as an opportunity for improvement and innovation, continually adjusting to ensure its relevance and effectiveness over time.

There are two methods for measuring resilience and adaptability. The first is an analysis of past shocks that the system has suffered and the speed with which the system recovered back to a steady state. The second is a data-driven approach based around the Positive Peace framework which is an accurate measure of resilience. Societies with greater resilience will more easily absorb the effects of shocks and recover more quickly in its aftermath.

Efficiency and Redundancy

Efficiency means that a system produces a maximum output with the minimum number of components and with the lowest level of resources. Redundancy means a system has excess capacity, or not fully used components or resources. In most

cases, efficiency and redundancy are antagonistic concepts.

Efficient systems produce the highest level of output with the minimum costs and use of resources. However, if a component or subsystem is stressed or fails, the lack of alternate paths or capacity means the system may become degraded or even incapacitated.

Building redundancies in a system reduces the expected losses from failures. However, this comes at a cost to efficiency. Systems with redundancies tend to be those with the highest levels of resilience, as they are capable of absorbing shocks. However, too much redundancy may mean the system is uncompetitive.

Redundancies can be constructed in two different ways. Redundancy of components means the system has unused, or only partially used, components. For example, a factory may operate with two computers instead of one – if one breaks down the other takes over, thereby creating a failsafe environment. Another example is an over-capacity in the health system to deal with any spikes in hospitalisation rates.

Redundancy of relationships takes place when two or more components are linked by a larger number of connections than strictly necessary. An example is when two cities are interconnected through various highways instead of just one.

Money Flows

Money flows represent the movement of financial resources within a system. Understanding these flows is critical as they shape the behaviour of the system elements, impacting relationships and feedback loops. They also help reveal the power dynamics within a system, as identifying the distribution and control of financial resources is crucial to understanding which actors and subsystems have the most impact on decision-making processes. In a national economy, money flows through various sectors, such as households, businesses, and government, are fundamental to the functioning of the society.

Flows of money within a system often give an idea of the size of subsystems or the importance of encoded norms. If the amount of money is growing over time, the system may be in a virtuous cycle of development. Conversely, rising monetary power may also be an indication of an imbalance. An example would be special interest groups that are subsidised by the taxpayer, which increases their ability to garner political influence which they use to secure additional government funding and concessions. Increases in the size of money stocks can also be a sign of emergence.

Functioning and Potential

System functioning refers to the dynamic processes, interactions, and behaviours shaping a system's operation. It captures how components work together to achieve common goals, emphasising interdependencies and feedback loops. For instance, in a transportation system, it involves vehicle flow, traffic patterns, and infrastructure responsiveness.

System potential describes how functioning could be altered with a change of inputs or a modification of goals. As such, it expresses a system's capacity for either future enhancement or future degradation. With regard to its capacity for advancement, it denotes the untapped capabilities inherent to a system that could be realised with, for example, additional resources or investment. In the case of a healthcare system, its potential for enhancement might entail going beyond existing practices of caring for patients to promote innovations to improve healthcare delivery or to address emerging health challenges.

With regard to a system's capacity for deterioration, potential refers to how system functioning could be undermined as a result of overwhelming shocks or a steady decline in resources, among other possible challenges. For instance, a society's potential for conflict and unrest might be realised if underlying tensions are not addressed, leading to a degradation of social cohesion.

System Purpose and Intent

While system functioning and potential refer to what a system does or could do, its purpose is what it is meant to achieve, while its intent is revealed through the outcomes it produces. Purpose and intent often overlap substantially, and in some circumstances it can be difficult to distinguish one from the other.

System purpose refers to the function that the system is meant to achieve, and there may be more than a single purpose. For example, the purposes of a business that builds reliable, cost-efficient solar farms may be to build a profitable company and also to help to reverse climate change.

For its part, system intent refers to the underlying motivations, objectives, or values that are not explicitly stated, but are inferred from the system's observed behaviour and patterns of action. Intent can be discerned from the systemic dynamics, cultural norms, and habitual practices within the system. For example, a healthcare system's outward purpose may be to provide accessible healthcare to a community within a government budgetary framework, emphasising a commitment to patient wellbeing. However, the intent may be revealed through cost-cutting measures and decisions prioritising profit over patient outcomes. While the stated purpose highlights patient-centric care, the observed practices suggest financial considerations taking precedence. Another example of the similarities and differences between purpose and intent might be an educational system for the development of knowledge and skills in students. The system purpose may be to provide students with a clear level of academic achievement for entering the workforce, while the intent of the system may be to make a work environment conducive for teachers, for example, by minimising class hours.

In contrast, in highly congruent or transparent systems, purpose and intent may be the same or very similar.

Causality in Systems

Identifying causality within a system is about understanding the influences that lead it to behave in certain ways. However, in systems, cause and effect become entwined. A mutual feedback loop is an excellent example of this.

Functions, events and emergence properties influence each other, causing changes in each. Therefore, differentiating between cause and effect loses its usefulness. This way of thinking avoids the pitfalls and failures of the old cause/effect

approach whereby an intervention is targeted at the presumed cause of a problem or vulnerability. Understanding mutual causality leads to a deeper perspective on agency, feedback loops, connections, and relationships, which are all fundamental parts of systems mapping. Constructive change occurs through stimulating many points simultaneously or progressively over time.

Stocks, Flows and Transformations

Stocks, flows, and transformations are fundamental concepts that help describe and analyse the dynamics of a system. Stocks represent the accumulations or reservoirs of elements within the system, often denoting the quantity of a particular resource or state variable at a given point in time. Examples of stocks could be the number of people in a country, the balance in a bank account, the amount of grain in storage or the number of persons incarcerated.

Flows are movements between stocks, capturing the rate of change in stocks over time. Examples could be money transfers, the movement of a prisoner to the workforce or immigrants entering a country.

In many instances, the nature of the elements accumulated in stocks or moving through flows remain unchanged. That means within a closed system what is stocked or what is flowing remains the same across time. For instance, money can be stored in a safe or be transacted between persons, without losing or changing its attributes. However, in practice, systems usually are not closed and have some flows that originate outside of the system. An example may be foreign direct investment into a country or the migration of people.

Transformations refer to the processes or activities that alter the state or composition of elements within a system. For example, materials and electricity could flow into a factory and undergo a transformation to become a machine, or a stock of food could undergo a process of rot and become unusable even if there has been no outflow from storage.

Stocks, flows, and transformations work together to characterise the structure and behaviour of complex systems. The interactions among these components are often governed by feedback loops and contribute to the dynamic nature of systems. They are essential for understanding how systems respond to changes, adapt to their environment, and achieve or maintain equilibrium.

Emergent Properties

A system evolves through time and its current properties do not fully describe its future dynamics. Finding new emerging properties is important in understanding the trajectory of the system. The speed at which properties of the system accelerate is good way of identifying emergence. Looking at a system's stocks, how they may increase in size over time, where they are flowing, and what transformations are occurring among elements along the way, can all give insight into a system's emergent properties. This can be seen through increases in money, the number of people employed, the rate of development of new technologies, or increases in the rule and regulations governing an aspect of society.

Non-Linearity of Effects

The effect of one part of a system on another is not always linear. Relationships may change depending on the state of development of the system. For example, for low peace countries, improvements in peace lead to small increases in worker productivity. However, as countries progress in peace, further reductions in violence lead to ever higher increases in worker productivity. This non-linear relationship has been discussed in IEP's Business and Peace Report 2024.

Attractor Planes

Attractor planes represent stable states or conditions toward which a system tends to evolve. Once in an attractor plane, it is difficult for a system to move out of it. These states act as points of attraction, and the system may exhibit stability when it converges toward these attractors. Between attractor planes, changes in the state of systems tend to be larger and more chaotic. In an ecological context, a stable population size or a balanced ecosystem structure can be considered an attractor plane.

Understanding attractor planes provides insights into the long-term behaviour and stability of a system, highlighting the factors that influence its trajectory and equilibrium. In a societal context, an attractor plane can be characterised by either positive or negative social conditions.

In the context of peace and conflict, analysis of the Global Peace Index (GPI) and the Positive Peace Index (PPI) has revealed two attractor planes, as discussed in Section 4 of this report. One is called Sustainable Peace and is the state where countries have high rankings in both the GPI and the PPI. None of the countries in the Sustainable Peace area of the GPI-PPI phase plane have had a substantial decline in their levels of peace in the 17 years of the GPI, despite shocks to their systems. The other attractor plane is the Conflict Trap[13], defined as low rankings in both the GPI and the PPI. Countries in this plane find it difficult to improve their societal resilience because of the losses incurred by high levels of violence and the ensuing destruction of their societal structures. Given their degraded levels of societal resilience, countries in the Conflict Trap region tend to find it difficult to exit this plane without external assistance.

Archetypes

Archetypes are common reinforcing themes or patterns of interactions that are seen in many systems. They serve as mental models that can be applied to different contexts to identify and address common challenges. The number of archetypes varies depending on who is defining them, but generally there are seven to ten. Examples are 'limits to growth', 'seeking the wrong goals' and 'exponential success'. The value in identifying the archetypes in a system is that they provide shortcuts for the analysis and help in finding solutions. Some examples of architypes are:

- *Limits to growth.* All systems have limited resources they can consume, after which the system will be impacted negatively.

- *Exponential success.* This is a runaway feedback loop where success increases exponentially, eventually dominating the system and potentially causing its demise.

- *Seeking the wrong goal*. This is related to the purpose or intent of the system. If the goal is inadequate, inappropriate or dangerous its pursuit will damage the system.

- *Rule breaking*. Rules are often set up to regulate and maintain the homeostasis through encoded norms. When rules which regulate society break down the result will be changes in the system's internal structure. This can be positive but more often is destructive.

- *Escalation*. This can be defined as one-upping. Think of two groups competing for shrinking resources, escalating wars, or politicians competing for the highest spending for the popular vote.

- *The tragedy of the commons*. This is where a common resource gets utilised by agents who will aim at maximising their own benefit from a commonly shared resource. If the resource gets over-utilised, then it can lead to rule breaking and escalation

Static and Dynamic Modelling

Static modelling analyses the system at a given point in time, while dynamic modelling uses many iterations of data over a period of time. Static models are useful when insufficient time series data is available for analysis. It is also useful for providing a snapshot early in the analysis that is simpler and easier to understand before building up the dynamic model.

To understand dynamic models, it is often necessary to use a system dynamics simulation modelling software package. This allows analysts to input data on the components of a system, including stocks, encoded norms and more. This allows the analysis to view changes over time to better assess the way the system has evolved and the impact of changes over time. These packages also allow for changing the parameters of the stocks and flows and encoded norms to model different scenarios, allowing for a fuller understanding of the possible outcomes that interventions may cause.

Analysis through Positive Peace

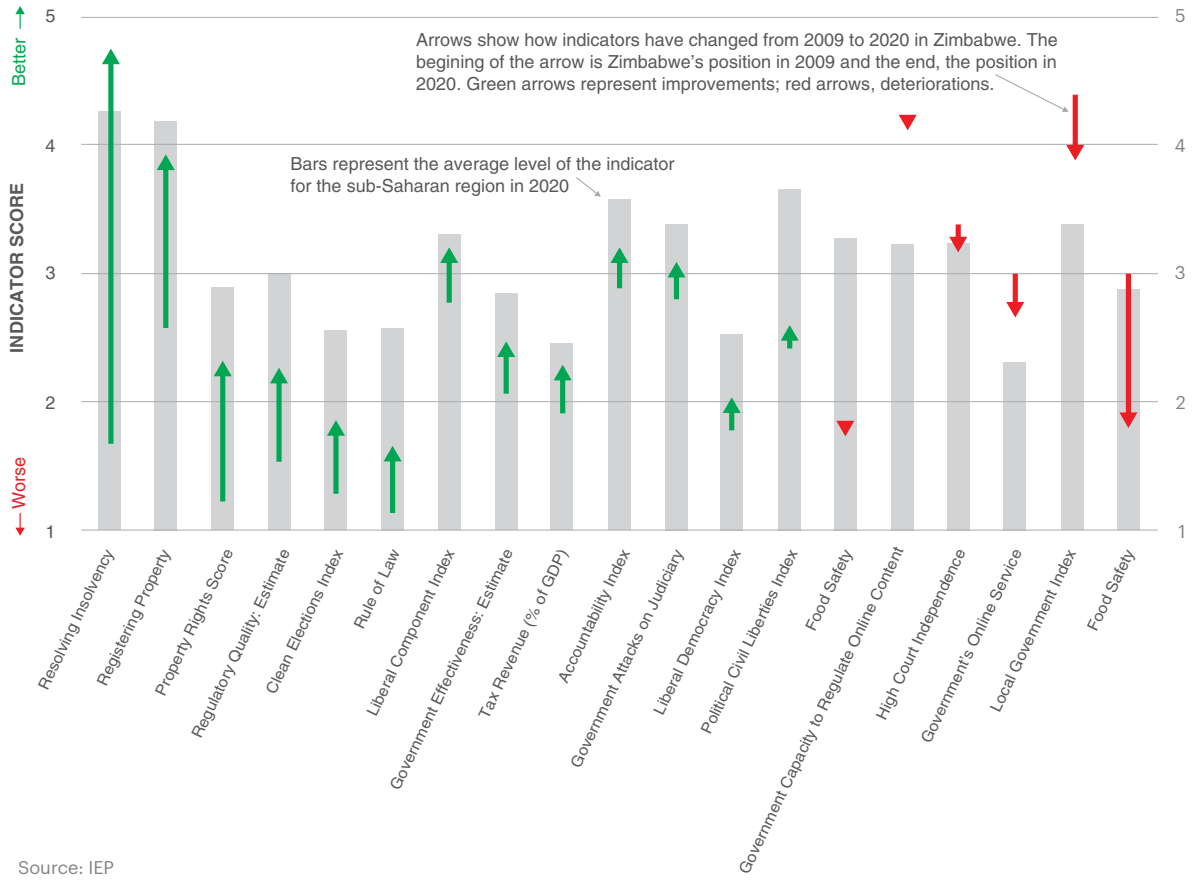
Positive Peace has been derived empirically to provide a holistic expression of a healthy societal system and as such it can be used in this process as a check on the extent to which the system has been analysed systemically. Once as model has been derived, each of items can be classified as belonging to a Pillar of Positive Peace. If the analysis is weak in a particular Pillar or Pillars, then there may be a flaw in the analysis.

In addition, Positive Peace as a multifaceted societal objective represents an excellent approach for analysing which interventions may be best for altering the system and their likely ripple effects. It allows for an approach that will consider multiple stimuli, rather than a small number which may have limited effect.

FIGURE 2.1

Example of changes in governance indicators, Zimbabwe and Sub-Saharan Africa

Zimbabwe has improved on many governance indicators over the past decade. However, the country remains less developed than its sub-Saharan African neighbours in many areas.



Source: IEP

Gathering the Relevant Data on the System

While not a conceptual component of systems analysis, understanding what data is available in relation to a given system is important, as the comprehensiveness of the data will affect the approach to the analysis. Some systems may have an abundance of readily available data, while in others it may be lacking. In some cases, more data may need to be collected or estimated before a constructive analysis can begin, as insufficient data may prevent the identification of substantive insights into the dynamics of the system.

Moreover, in some cases the fact that certain elements or subsystems are richer in data than others may reflect a higher level of importance within a system, as resources have been dedicated to measuring them. As such, identifying data availability across a system can help determine the most promising areas for deeper analysis.

Searching for relevant data and the development of new datasets can also be a reiterative process undertaken throughout the analysis. As new insights arise, gaps in the data may also arise.

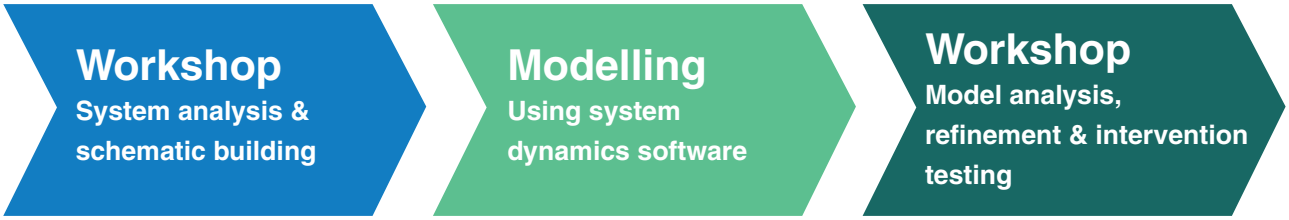
Where accurate and consistent data is available, a system may be characterised by a set of statistical indicators that could constitute the foundation for the analysis. However, it is often the case that statistical data for the specific system or subsystem is not produced and values and figures need to be estimated indirectly through proxy data or via qualitative or subject matter expert assessments.

For instance, IEP has curated a set of approximately 400 indicators grouped by specific systemic areas based around Positive Peace to assess the level of societal resilience and development in a country. These indicators can also be compared across similar or neighbouring countries, states, or communities to provide deeper insights. They can be broken down further and can be grouped under IEP's Positive Peace framework to better analyse the strengths and weaknesses of the overall system.

As an example, Figure 2.1 shows data from Zimbabwe, comparing the country's status relative to its neighbours across 18 indicators and giving insight into where the country is improving and where it is underperforming. Although Zimbabwe has recorded improvements in a number of governance indicators over the past decade, the country's performance remains inferior to regional averages in sub-Saharan Africa for many indicators.

FIGURE 2.2

Phases of the Halo Process



Source: IEP

Phases of the Halo Process

While the Halo approach is flexible and can be tailored to specific circumstances, its elements unfold over a three-phrase process, outlined in Figure 2.2. These phases can run across different timeframes, ranging from just a few days to several months, depending on the requirements of those seeking to understand and probe a given system. Additionally, an analysis can later be revisited at some time in the future, updated with new data or with a new focus question.

Pre-modeling workshop

At the heart of the Halo approach is a deliberative process among stakeholders and those with direct knowledge of system functioning. Through structured consultation, a robust but focused representation of the system is developed. Led by an experienced facilitator in the Halo process, this phase is guided by the steps for mapping systems attributes that are outlined in the previous section.

Usually taking place over several days, the pre-modelling workshop is one of the most intensive phases in the Halo process, as it requires stakeholders to methodically evaluate the fundamentals of the system in question.

In addition to fostering a holistic perspective about the functioning of the system, the pre-modelling phase facilitates critical reflection on previously unexamined understandings about the influence of key subsystems and processes. Although the primary purpose of this phase is to generate an accurate representation that can later be used to *quantitatively* test different scenarios, the pre-modelling workshop is particularly valuable for generating *qualitative* insights into the system's functioning.

Establishing the limits of a given system can be difficult, as most social systems overlap with other systems. As such, focusing on a central problem or research question can help in defining manageable bounds, though this problem or question may be refined or changed later in the process. Once a working question is articulated, developing a schematic representation of the system follows a multi-step process. This process includes:

- Defining the intent of the system
- Establishing the bounds of the system
- Identifying the key stocks, flows, and subsystems within the system
- Defining the purpose and functioning of the subsystems

- Defining the system's encoded norms by estimating tolerance thresholds or limits at which various system components can maintain or return to a state of stability when confronted with substantial changes in the flows
- Integrating previously collected data, or informed best estimates generated through consultation, into the stocks, flows, and connections within the representation.

Modelling

Following the initial workshop phase, the Halo facilitators translate the system representation generated by the stakeholders into a computer-based model using system dynamics simulation software. Depending on the complexity of the model, the time required for this phase can range from a few hours to several weeks.

Post-Modelling Workshop

After the modelling phase, the stakeholder group reconvenes and engages with the computer-based model. With the support of Halo facilitators, simulations can graphically depict the changing dynamics through the life of the model. By changing base assumptions, such as stocks or encoded norms, different scenarios can be run, resulting in better assessments of possible outcomes. The visualisation of the model also helps in understanding inflection or tipping points within the system.

By engaging with the model, stakeholders can see the impact of the assumptions they defined. In real time, minor adjustments can be made to refine the model. More substantive changes may require more discussions before making the envisaged changes. As previously discussed, these changes may involve alterations to the starting balances of stocks, size of the flows, the encoded norms, or other parts of the system.

This phase allows stakeholders to test the impact of different changes and interventions on the stocks and flows within the model. They can see which model components have the largest effect on other components and which have the smallest effect. In this way, they could identify, for example, where investment or reform would be the most impactful.

Steps To Mapping System Attributes Using Halo

Analysing systems can be lengthy, resource intensive and expensive. One of the most critical difficulties in the process is the lack of comprehensive information on the state and dynamics of a system. Therefore, it is important to understand the scope of the work that the research team can undertake and the limitations they face. Arguably the best approach is to start with the simplest depiction of a system and progressively build its complexity.

An example of how to perform an analysis is set out below. This has been done for purely illustrative purposes; however, it does demonstrate the way the attributes come together to form a sophisticated analytical framework and the way the attributes can be used in combination. The 13-step process below uses fewer than half of the conceptual building blocks described above. Additional building blocks can be used depending on the sophistication of the model, the availability of data, and the abilities of the analysis team.

Developing a project plan is the first step. Think through which of the system attributes will be used and to what end. It is important to understand why the analysis is being done and what the outcome will be used for. It is good to do a number of iterations of the analysis, deepening the depth each time. As a rough guide, it is useful to cover in the first third of a project all the selected attributes. That will result in at least a fuzzy view of the system. It will also provide an opportunity to understand where additional focus is needed on the next iteration to build the model out.

Generally, there are at least four sources of information that can be drawn on to populate the stocks and flows within a system model: expert assessment, deliberative forums, survey data, and numeric data. The utility of each source will be dependent on the coverage and quality of the available information and the availability of funds for the study. Obviously, undertaking new surveys or convening deliberative forums can be expensive and time consuming.

If the budget and timeframe allow for the development of new datasets – for example, surveys on people's values – then generally undertaking them after the first pass through the methodology is the best approach. However, in some cases where there may be limited data available, it will be helpful to gather it before starting. Also, if the timeline is short, it will not allow the necessary time to complete a mid-project survey. It may be that data gaps can also be plugged using AI or the analysis of sentiment from media databases or other sources. Expert panels can also be formed who can estimate data values as well.

The analysis team can be small, but for practical purposes a minimum of three people is usually best, ideally with buy-in from key decision-makers. Too many and the process will become unwieldly. Therefore, having access to community groups or expert input can be helpful for specific parts of the process.

Deliberative forums can be useful in framing the initial question or objective of the study. They are also useful in helping to understand path dependencies within a system or cultural encoded norms as these will be associated with values within a community. A deliberative panel is a representative group from a community, usually formed around a specific issue, and will attend presentations and make recommendations, based on the expert input and the discussions within the group. Examples of this could include providing input into an infrastructure project in specific neighbourhood or providing health services to an immigrant community.

The 13 steps outlined below have been organised to flow in a logical sequence. However, conducting a systems analysis using the Halo process is intended to be both fluid and iterative. This means that those undertaking a given analysis can choose to focus on certain steps over others, and steps can be revisited one or more times as insight is gained into system functioning. That said, with regard to the three phases of the Halo process outlined above, steps 1-10 roughly correspond to the pre-modelling phase and steps 11-13 roughly correspond to the

modelling and post-modelling phases. The model is typically built within a dynamic systems modelling software. Some of the steps below are discussed more succinctly than others. However, all steps are considered important in this analysis.

Step 1 – Articulating the Objective of the Analysis

A system can be understood from many different perspectives, but the starting point is determining the objective of the analysis. For example, within a given social system, if the aim of the analysis were either to improve family planning, on the one hand, or to contain terrorism, on the other, the knowledge needed and the approach taken would be very different, even though many of the assessed components and dynamics of the system would be the same.

The first step of the Halo process is defining a clear and practical research question, as it provides a crucial roadmap for the investigative journey. Because any societal system analysis necessarily results in a simplified representation of a complex system, a well-crafted research question establishes clear boundaries, ensuring that the analysis remains manageable and focused on the system's most relevant elements and relationships.

Rooted in a perceived problem or knowledge gap, the research question becomes the linchpin for understanding and addressing the intricacies of the system under investigation. It provides a structured framework for decision-making and hypothesis formation, guiding the subsequent phases of data collection and analysis. By setting clear priorities, this structured approach not only streamlines the research process but also enhances the likelihood of deriving meaningful insights and solutions.

The question sometimes changes as the analysis progresses; as the knowledge base increases, more subtle interpretations of the issue can arise. For example, an analysis could start with 'what is the optimal number of police to prevent an increase in crime?'. But it could change to 'what is necessary for the criminal justice system to be in homeostasis?'.

Step 2 – Identifying the Bounds of the System

The next step is to define the boundaries of the system to be researched. This can be done through defining a geographic area or a social grouping. In this sense a social grouping could be a formal body such as an education system, or a monetary system, such as a card payment system. Countries, states, and administrative districts are good to use, if applicable, as their bounds are clearly defined, as well as their administrative processes and laws to govern them. The boundaries of a system can be detected through different approaches such as geographical areas, coverage of legal instruments, expert opinion and ethnicity or religion. It is also important to realise that all societal systems are open systems, meaning that stocks and flows outside of a given system will inevitably affect the stocks and flows within it. These flows can be estimated, kept as a constant or modified depending on the dynamics of the model, and sometimes they can simply be ignored.

Some of concepts related to the bounds of the system are clarified in the following examples:

1. A country's health sector is a system whose boundaries can be relatively clearly defined through an enumeration of its components: the set of medical doctors, hospitals, the ambulance service, the national health budget, etc. Excluding certain subsystems is also important in describing the bounds of a system. For example, it would seem reasonable to most people to exclude traditional healers or physic healers, but could a police department be considered part of the health system? One key purpose of the police is to prevent violent crimes, and as such, effective policing reduces hospital admissions. However, police departments are covered by different legislative, budgetary and administrative frameworks than the health sector. Therefore, instead of characterising the police department as a subsystem of the health system, it would be more precise to think of it as part of the separate criminal justice system, which interacts with the health sector.

2. The natural environment represents a system in which components and subsystems interact in complex ways. The simplest way to define the bounds of the system is to define the physical boundaries of the ecosystem. For example, a forest often has defined geographical boundaries which set the limits of that system in broad terms. However, it may also contain rivers flowing through it that originate far away and its atmosphere, or its vertical upper boundary, is also affected by other systems.

3. The legal system can be characterised by large and complex subsystems such as the legislative, the judiciary, law enforcement, law colleges, among others. However, a particular legal instrument or a specific law is not a component of the legal system. Rather, it is an encoded norm, that is, a rule governing the function of a system or subsystem. For example, the law governing the manufacture of seat belts is an encoded norm in the car industry.

Step 3 – Defining the Major Subsystems

Once the boundaries of the system have been defined, it is important to consider the subsystems that exist within the system. It is not necessary to consider every possible subsystem as there will frequently be many, but it is important to understand the most influential subsystems. They can be determined by the same approaches used to identify a system. As the analysis progresses, often subsystems become apparent which were missed on the initial passes. Analysis of stocks and flows, the input of expert opinion, and review of available data, are some of the ways that subsystems can be identified and defined.

Step 4 – Identifying the Purpose and Intent of the System

Recognising the purpose and intent of a social system is crucial for understanding the fundamental dynamics that drive it. The system purpose serves as the compass, providing a formalised framework for the system's goals, objectives, and intended outcomes. It serves as a guiding principle for understanding decision-making, resource allocation, system momentum, and possibilities for redirection.

While in some societal systems, purpose may align perfectly

with intent, in others it does not. As such, recognising intent is equally important as it unveils the underlying motivations, values, and cultural norms that shape the system's behaviour. While the system's purpose refers to what its function is meant to be, intent reveals the often-unstated forces that influence decision-making and drive habitual practices. Identifying intent is essential for uncovering potential misalignments between stated goals and observed behaviours, highlighting areas where there may be discrepancies or areas for improvement.

This dual perspective, considering both purpose and intent, provides a more comprehensive understanding of the social system, enabling stakeholders to navigate complexities, address potential conflicts, and foster a more transparent and effective functioning of the system.

An example of where the purpose of the system and its intent do not align could be a school improvement plan, where money is given for the capital improvements for the neediest schools. However, if the decision is made for political purposes, then the allocations may be made to schools with the most political relevance rather than the neediest schools. In this case, the purpose and the intent would not be aligned.

Another example may be an infrastructure project where the purpose is to build a road, while the intent is to improve commerce. However, corruption may reshape the intent. There can be multiple intents and purposes. Moreover, the intent of subsystems may be different than the intent of the larger system. For example, the intent of workers on the infrastructure project may be to maximise the amount of time spent working on the project, while the implementing company may be interested in maximising profit.

Two analytic methods that help in understanding purpose and intent are expert assessment and deliberative forums. Both have been discussed above. When the purpose and intent is not obvious then outside help can be useful. For example, in the case of a criminal justice system, stakeholders would not only involve police, judges, lawyers, but also people affected by crime, criminals and others that the policing function touches.

An analysis of "national intent" – that is, the beliefs and values a country exhibit in relation to its politics, economy, international relations and social policy – is provided in Section 5 of this report.

Step 5 - Defining the Functioning and Potential of the Subsystems

The next step is to define the functioning and potential of each subsystem. This process needs to be concise, because lengthy and detailed descriptions can confuse the analysis without providing any substantial informational gain. It is best to use bullet points to describe the functioning and potential.

While a given subsystem may have a wide range of functions, the focus of identifying its functioning should be on its activities specifically in support of the purpose and intent of the larger system, and in relation the research question being asked. For example, within the criminal justice system, the legal subsystem would be composed of legal professionals and members of the court engaged in the prosecution and defence of alleged criminals, and these activities would be directly related to criminal justice. However, the subsystem would also include areas of activity not directly connected to criminal justice, such as family law, real estate transactions, or corporate law, and these would be tangential to the analysis. Additionally, the functions may not fully align with the purpose and intent of the system. For example, consider a transport system where the functions revolve around providing a reliable train service but where employees are engaged in long-term rolling strikes for better conditions.

The potential of each subsystem can be outlined by considering how its functioning could either be enhanced or degraded based on changes in the resources at its disposal and the approaches it adopts. It could also be improved by better alignment of the functions of the subsystem with the purpose of the system. In the legal profession, enhancements in functioning might be realised through added investment in the offices of both prosecutors and public defenders, while deteriorations might occur as a result of political changes leading to the implementation of either overly punitive or excessively permissive policies in prosecution and sentencing.

Step 6 – Developing System Diagrams

System dynamics can be complex, and it can be difficult to consider all the relevant aspects. Visualising information can make it significantly easier to gain insights into the dynamics and obtain a more holistic perspective. There are a number of different approaches. These include cluster maps and interconnection maps.

Cluster maps are basically free-form diagrams of what a group of people think a system may be. It is a qualitative exercise involving a small group of three to five people providing insight. The aim is to generate the cluster map quickly. This is best characterised as a 'brain dump' rather than an analytical exercise.

Interconnection maps create lines reflecting the relationships between each different bubble. The bubbles can represent functions, subsystems or purposes. The size of the bubble can be drawn to represent the importance of the component and the thickness of the connecting line can be drawn to represent the strength of the relationship.

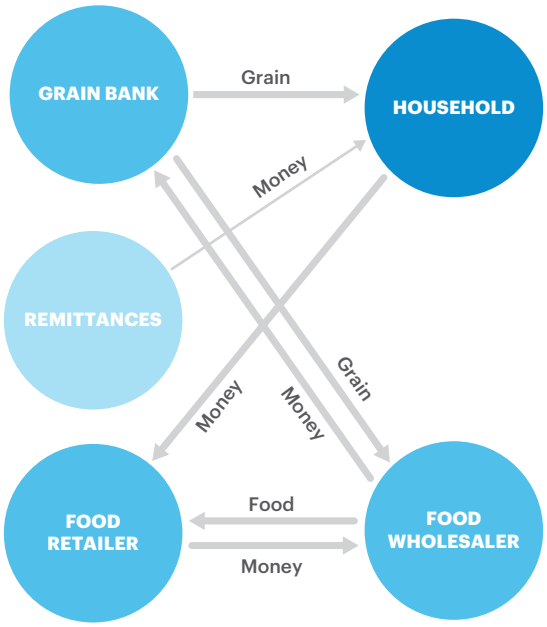
The aim of this step is to determine whether the conceptualisation that the analysts are developing reflects the way the system is operating and makes intuitive sense. It may give insight into subsystems or stocks and flows that have been missed.

Figure 2.3 is a very simple example these types of maps, which could have hundreds of items and arrows.

FIGURE 2.3

Grain subsidy program

Stocks and flows in a grain subsidy program.



Source: IEP

Step 7 – Identifying the Stocks, Flows and Transformations within the System

The next step is to develop the stocks and the flows associated with the functions of the subsystems. Stocks can accumulate or be depleted; flows can strengthen, weaken, or reverse.

The objective is to map the interrelations between the different subsystems. The relationship between the stocks and flows of subsystems will show how the subsystems relate to each other. Again, use simple bullet points to define the stocks, what flows into it and what flows out (Figure 2.4). Also map any transformations that happen inside the subsystem. For example, materials can be transformed into a final product within a manufacturing plant or criminals rehabilitated through the criminal justice system. It is also good to rank the importance of each function. The number of people involved, the amount of money transferred, or the depth of the laws surrounding an activity, can provide a strong indication of importance.

This approach can be data driven based on available statistics. It may be the way government funding passes to and through organisations, it could be the rise and fall in the stock levels, or prices of important commodities, or it could be the number of people employed in the hospitality sector.

In a static analysis of a system, the values stocks and the flows can only be represented as a single snapshot in time. In a dynamic model, changes over time can be observed, typically with the assistance of system dynamics modelling software

FIGURE 2.4

Example using data nesting – education department system

Listing of all the stocks, flows and transformations within a system is a critical step for understanding the dynamics of the system.

EDUCATION DEPARTMENT	**SYSTEM**
○ **SCHOOLS**	**SUB-SYSTEM** **STOCK**
○ Annual Budget	**STOCK**
○ School Budget Transfers	**STOCK**
○ Government Funding	**FLOW**
○ ...	...
○ Teachers	**FLOW**
○ Training Colleges	**STOCK**
○ **CHILDREN**	**STOCK**
○ **PRODUCTION OF SCHOOL CURRICULUM**	**TRANSFORMATION**

Source: IEP

As described in more detail in step 8, the values of stocks, flows and transformations are ideally ascertained statically based on hard data. However, when this is unavailable, estimations of the size of the stocks and flows can be produced by expert assessment, or through informed deliberation by those conducting the analysis.

Transformations can be understood by seeing the differences between incoming flows and outgoing flows. If there is a difference, then there must be a transformation occurring. Similarly, if there is a stock that is different to the incoming stocks, then there is a transformation. Some transformations are obvious, such as a manufacturing process; however, others are less obvious, as within a theatre company, in which people, money and costumes are turned into a play. Some stocks and flows are more important than others. A simple approach is to assign a value of importance. The scale does not matter, providing it is large enough to cover important variances in observed stocks and flows. This data can then be entered into a database, which can then be used within a dynamic model. These relationships between stocks and flows within and between subsystems can be 'one to one' or 'one to many'.

Step 8 – Assembling Data and Best Estimates

The next step involves gathering data and information on the stocks and flows within the system. Where accurate and consistent data is available, a system may be characterised by a set of statistical indicators that could constitute the foundation for a deeper analysis. Stakeholders engage in a data collection process, drawing from various sources, with the aim of quantifying the variables that represent the system's stocks, and the mechanisms by which these stocks change over time through flows.

However, it is often the case that statistical data for the specific system or subsystem is not produced, and the analysis needs to be conducted indirectly. In this case, informed best estimates

can serve to fill in the gaps. This estimation process may involve a combination of quantitative analysis and qualitative insights, sometimes entailing the collection of proxy data or subject matter expert assessments. For example, in a farming model, temperature estimates may be needed for predicting future rates of evaporation due to global warming. Another example may be that to understand the viability of future government royalties and taxes, estimates for the reserves of rare earth metals may need to be made.

These estimates and data are crucial inputs for eventually populating a working model, which allows for the simulation and analysis the system behaviour over time. The iterative nature of the process allows stakeholders to refine their estimates as they gain more insights and as the model is tested against real-world observations, fostering a dynamic and evolving understanding of the system's complexities.

Step 9 – Recognising the Encoded Norms within the System

Identifying the encoded norms may be one of the more difficult parts of the process, as they are seldom clearly defined. This is especially true when looking at cultural norms or values, such as employment norms regarding levels of wages and work safety or discriminatory behaviour.

They can also change depending on other variances within the system. For example, in an economic recession, the trigger for additional spending on the homeless may be reset as the government embraces austerity measures to save money.

After creating a system diagram, identifying the stocks and flows within the system, and populating those elements with hard data is a good point to identify the encoded norms. Identifying the encoded norms within the system will allow for the refinement of the conditional relationships. It will allow for a better understanding how stocks in one part of the system may affect flows in another, and how the passing of certain thresholds may trigger certain reactions.

Encoded norms refer to the accepted actions, rules, regulations and cultural norms within a subsystem. For example, one encoded norm would be to purchase goods if the inventory dropped below a certain level, while another would be to change suppliers, if specific quality thresholds were not met.

It is typically a good approach to starting simply, by focusing on the most important encoded norms, the ones that are easiest to identify or ones where the values are most clearly understood.

Step 10 – Identifying Path Dependencies

Detecting path dependencies within a system involves investigating how past events and decisions continue to shape its present state. As such, gathering both stakeholder perspectives and historical data can be crucial in gaining a sound understanding of path dependencies, which in turn can facilitate more informed interventions or adjustments to the system.

Analysing the historical evolution of the system reveals pivotal moments and milestones that set it on its current trajectory. Examining feedback loops, policy frameworks, and institutional structures helps pinpoint how the consequences of past actions persist, creating self-reinforcing patterns that influence decision-making. Moreover, resistance to change is often indicative of entrenched path dependencies, as certain elements resist modification due to factors deeply embedded in the system. Causal links between past events and present outcomes offer insight into the interconnectedness of the system's history. Additionally, understanding emergent patterns and considering common system archetypes can illuminate how past decisions or conditions have contributed to the current configuration.

Path dependency is important as the cultural and historical conditions of the system will set the bounds in which the system can operate. It will also give some insight into the intent of the system. If the system has had a traumatic past, then that will affect the intent of system. It is likely to lead to an overemphasis on mechanisms for protection and safety.

Path dependency can be understood through an analysis of the system's history. In the case of a country, it can be viewed through economic, political, social, and legal lenses. The political lens would cover aspects of foreign relations, including wars. This can be achieved by expert assessment.

Step 11 – Performing a Dynamic Analysis

Once steps 1 through 10 have been carried out, the elements from the analysis are ready to be translated into a computer-based simulation. It is worth noting that these steps are an example of how to use the Halo societal system modelling framework, and an analysis may entail more of the conceptual building blocks outlined at the beginning of this section or fewer of them. Steps one to 10 utilise about half of the building blocks in the Halo process.

Once the relevant information has been included into the model, including the stocks, flows and the conditional and unconditional relationships associated with the encoded norms, a baseline analysis can be performed. This is important because systems are dynamic, so the changing data will allow for a better understanding of the changes in the flows over time – which stocks are increasing, which stocks are decreasing, and which ones are staying static. Many iterations of the model can be run by changing the conditional relationships or amending the inputted data. This will provide insights that can inform future interventions, as changes in the stocks and flows may highlight bottlenecks or shortages, and changes in the encoded norms will model better thresholds or timing of the feedback loops.

Additionally, observing the trajectory of the system provides an appreciation of how the system could evolve, leading to a better understanding of the system's end state. It also provides insight into the qualities of the system, including emergence, homeostasis, or reaching the conditions associated with any of the archetypes.

Not only will the model highlight emergence it will also highlight sunsetting. Sunsetting is the opposite of emergence and is typically something that is fading away; this is where stocks or flows are dwindling. This may be due to obsolescence, malfunction within the system, innovation, and other factors.

This type of analysis will give some clear insights into the dynamics of the system. There may be factors that need to change, such as the pace of innovation or high levels of corruption or alternatively, give indications of emergence. Sunsetting may be a good or bad thing depending on the circumstances. For example, if the stock of people who are undernourished is falling, then that is positive. Where stocks and flows are increasing and these increases come off a low base, this can indicate an emerging quality within the system. This again may be a good or bad. If the levels of terrorism or civil unrest are rising, then it is bad, but the fast uptake of a new vaccine amid a pandemic would be good.

More examples of sunsetting are when electric cars replace gasoline-powered cars because of innovation driven by a desire to reduce CO_2 emissions. Another example highlights cultural change: if the role of traditional local leaders declines in certain pastoralist communities, and the government agencies taking up responsibility for administrative matters are not respected or seen as legitimate, then this can lead the further deteriorations in the system. Alternately, if the new administration works well, then the system is evolving, resetting its encoded norms and moving towards a more unified approach to administration throughout the system.

Step 12 – Creating the Interventions

Once this analysis is complete there will be enough knowledge to start to look at what interventions need to be performed to modify the system and to set it on a new course. This can be done by testing different scenarios of the model – for example, by adding resources or elements to a given stock or changing the rate of movement of a given flow. For each such change, it is important to have clear conceptual and practical understandings of how such changes could be made in the real-world system.

In defining the interventions, it is generally better to attempt to do many small nudges, rather than one big intervention to change the status quo. The main reason for this is that it lessens the possibility of mistakes. One big mistake is difficult to recover from, whereas small changes can be undone more easily, even if they are numerous. In addition, drastic changes – even those in the right direction – can be disruptive and, in extreme cases, destabilising for the system. Abrupt changes create a great deal of uncertainty and individuals, groups or organisations may be unsure about how they fit in the new systemic structure. For this reason, it is possible that these large changes may cause resistance and antagonism.

Step 13 – Checking Against Positive Peace

Positive Peace, because of the way it was derived, provides an ideal framework through which the various interventions proposed can be viewed to determine whether the interventions are truly systemic. Each of the interventions can be grouped under one of the eight Pillars of Positive Peace. Using this approach allows the analysts to see whether the interventions cover all of the eight Pillars or are slanted towards a couple of specific Pillars. It may be that it is acceptable for the emphasis to be one or two Pillars, but generally actions taken within these Pillars will have spillover effects into other Pillars, and there may need to be balancing actions. Also, the process of grouping the interventions under the eight Pillars will provide insight into the nature of the issues that need to be addressed.

If it occurs that a number of Pillars are not included or there is only a small number of items associated with a specific Pillar, this may indicate that something is missing from the analysis. However, for very specific and targeted applications, the absence of items in particular Pillars may be acceptable. If for example, the analysis was aimed at improving media freedoms, the Pillar *Good Relations with Neighbours* may not be applicable, or may contain only a small number of items.

Sample Application of the Halo Process

This section sets out a practical application of the Halo process: the analysis of the criminal justice system of an Australian state. The framing question that the group posed was whether the criminal justice system was adequately resourced.

The project began with a multi-day pre-modelling workshop. In anticipation of the workshop, available crime, criminal court, and criminal detention statistics were collected and used to inform discussions on the stocks and flows of the system. In cases in which data was unavailable, estimations were made, particularly for values associated with some of the flows, tolerance thresholds, and encoded norms within the system. The steps of the Halo process were followed to build a representation of the central components of the criminal justice system and the conditional relationships within it.

The outcome was a sophisticated dynamic computed based model focused on mapping the flows of individuals engaged in crime through the criminal justice system and provided a robust decision-making platform to model the flow-on effects of changes in crime rates, the stocks of police officers and prosecutors, and recidivism rates.

A wide array of institutions and actors were discussed, including judges, defence attorneys, prison staff, the media, politicians, police academies, and law schools. While the incorporation of a multitude of actors and subsystems into a model can potentially increase its accuracy and comparability to real-world systems, additional components can also exponentially increase the number of connections and dependencies, making the dynamics of a model much more complex and difficult to interpret. They can also be periphery to the central components of the system and the central research question. Therefore, focusing on the core subsystems within the system can provide a manageable level of complexity. The representation below consists of four interrelated but essential subsystems, comprised a total of 37 dynamic and non-dynamic elements, including stocks, flows, and rates:

- People in the community regularly engaging in crime ("criminals")
- Police officers
- Prosecutors
- Support services (including probation officers and social workers)
- Thirty-two dynamic elements
- Five non-dynamic elements

Following the steps in the Halo process, the workshop participants identified these elements and features of the system: the intent and bounds of the system; the system's key stocks, flows, and subsystems; and the subsystems' purpose and functioning. The movement of criminals through the system became the central focus of the model, while the police force, prosecutors, prison, and support services were treated as the main subsystems. Estimated tolerance thresholds – or encoded norms – were established for each to govern the dynamics of the movement of people in and out of the categories.

Following the workshop phase, the system representation was translated into a computer-based model using a simulation modelling tool. The graphical interface of the model is shown in Figure 2.5.

Figure 2.5, shows the movement of criminals through a potential journey of apprehension, prosecution, incarceration, probation, release, and successful reintegration into society, or back to the initial stock of active criminals. The recidivism rate was a dynamic element and adjustments could be made to the components representing the support services, which would impact recidivism rates in the model.

The model also shows the three subsystems of police, prosecutors, and support services, including these subsystems' relationships with criminals on their journey and the dynamics of recruitment and retention within these professions. In the case of police, for example, the model assumes that a larger stock of officers results in a higher rate of criminal apprehension, while a greater prevalence of crime increases the rate at which officers leave the force, based on the idea that the job becomes more stressful. These were dynamic elements of the model.

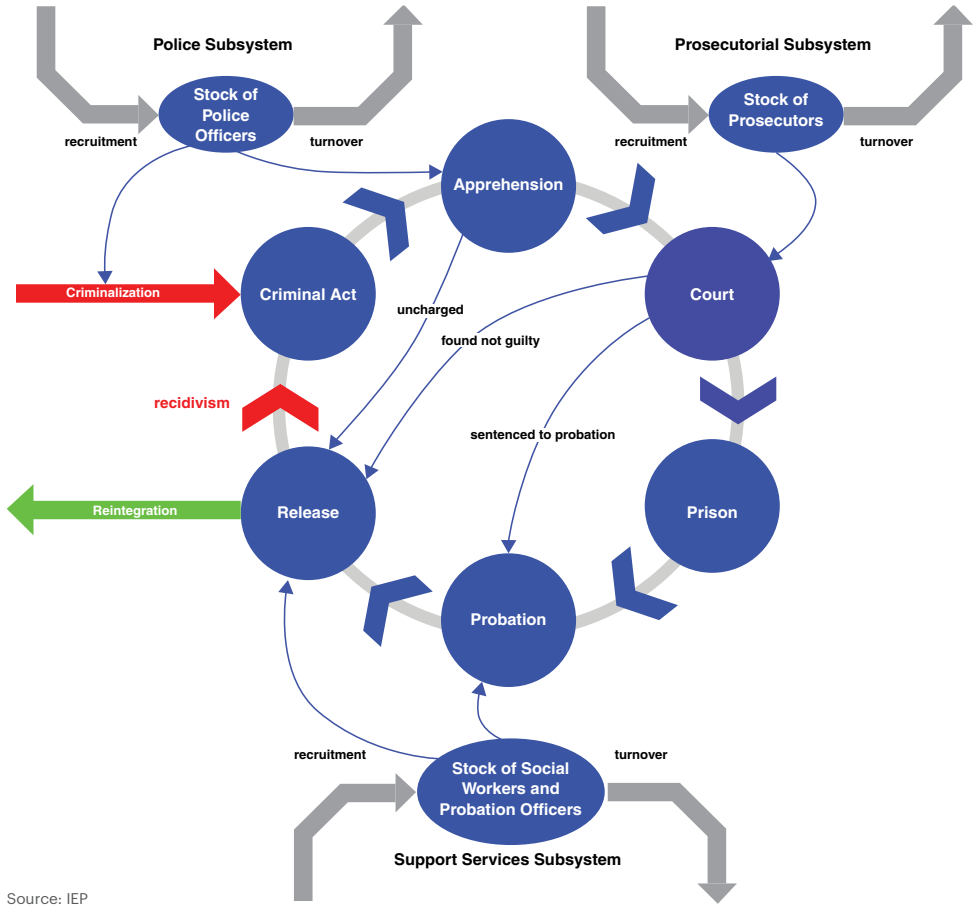
After the construction of the computer-based model, various scenarios were tested and three were presented during the post-modelling workshop.

Scenario 1: First, the model was left to run as initially created, and data on the values of the stocks, flows, and rates across the system were recorded and exported. Depicting the uninterrupted life of the model over several decades (15,000 days), the left side of Figure 2.6 shows the crime rate initially increasing and then steadily declining until bottoming out at around 1,250 crimes per day. This change was largely, though not entirely, driven by changes depicted on the right side of the figure: the stock of police officers climbs from 12,000 to a temporary plateau of 14,000, before rising again and topping out at 16,000 officers, when the rates of entry into and departure from the police force become the same.

Scenario 2: The second scenario introduced a change. In this change, when the stock of active criminals in the community surpassed 100,000, the rate at which people entered the criminal pool jumped up by ten per cent. This greater flow into the stock of criminals drove increases in the prevalence of crime, which in turn drove down police retention. A feedback loop was thus

FIGURE 2.5

Model of a criminal justice system developed for a simulation modelling tool



Source: IEP

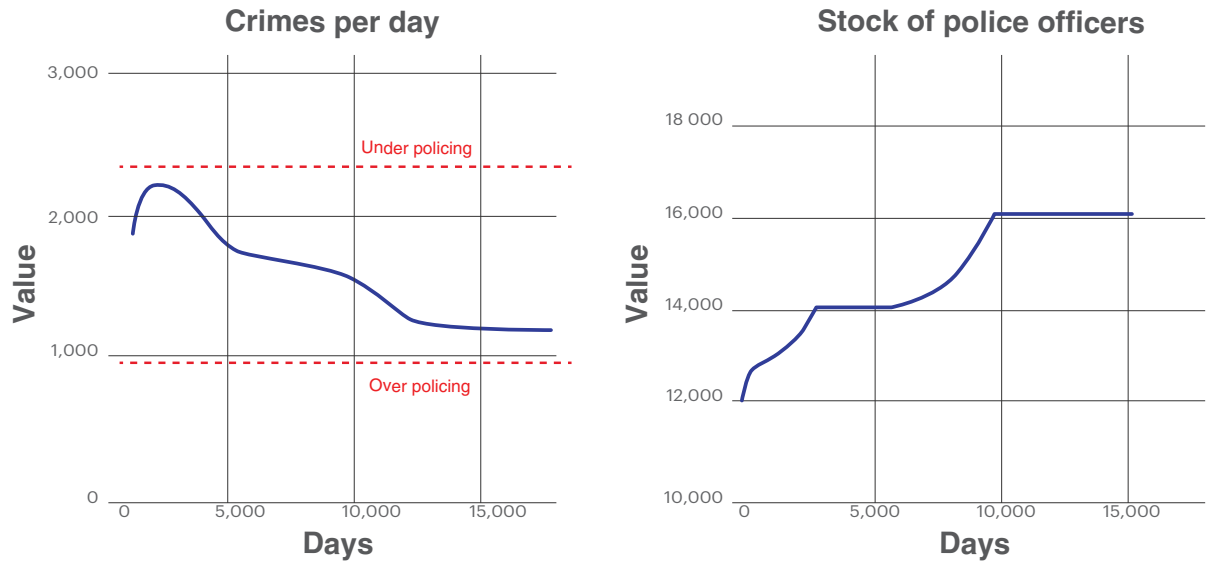
created whereby lower police stocks led to higher criminal stocks, which further drove down police stocks. As a result, the established bounds, or encoded norms, of the model were overwhelmed and the stock of police eventually plummeted, effectively "breaking" the system.

Scenario 3: To correct for this issue, another change was introduced in the third scenario: the police retention rate was increased by ten per cent. In this scenario, the higher crime rate was never able to overwhelm the police retention rate. The system was thus able to bring the crime rate down moderately and achieve a new state of stability under the changed conditions.

The real-life implication of a simulation of this kind is that increasing the desirability of continued membership in the police force could ensure that the system is not overwhelmed, even as a heightened crime rate works against police retention. Examples of how this could be achieved include: investment in better working conditions, higher salaries, and stress leave.

FIGURE 2.6

Crimes per day and stock of police officers under Scenario 1



Source: IEP

3 Positive Peace, Resilience to Ecological Shocks, and Systems Thinking

Research has shown that a country that enjoys high levels of Positive Peace is more capable of shielding its population from the immediate impacts of adverse shocks, including droughts, floods and earthquakes; and recovers more quickly in their aftermath. Thus, Positive Peace is often seen as a gauge of socio-economic resilience.

The threats assessed in IEP's Ecological Threat Report can generate crises in countries depending on whether their internal structures are able to cope with various ecological shocks.

A country's ability to cope will depend on the severity of the shock and the levels of socio-economic resilience[14]. In countries with low socio-economic resilience, the ecological shocks can trigger tumultuous breakdowns in their internal structure. This can result in frayed international relations, growing risk of conflict, forced displacement of persons both internal and cross-border, and a fertile environment for recruitment into radical militant organisations. Therefore, being able to understand which countries are most likely to suffer the most severe ecological shocks and which have the lowest levels of societal resilience provides a list of countries who need the most support to avoid violence, conflict, and famine.

Hotspots: Shocks and Resilience

Shocks can be classified as sudden substantial inputs into a system. If large enough, they will overwhelm the internal structures of the system, causing them to change or even collapse. The resulting system from the shock may be a better system or worse depending on the resilience of the system and the strength of the shock. The COVID-19 pandemic, for instance, was a shock to society because a new input – contagion – which affected how individuals, groups, governments, and businesses operated. This affected the economic, political and health systems of countries.

Some shocks can be internally generated and are the result of a societal system's own dynamics. These are known as *endogenous* shocks. Examples of endogenous shocks are political revolutions, civil unrest or economic crises. *Exogenous* shocks have causes and triggers that lie outside the social system, such as some types of natural disasters, invasions or pandemics[15]. Shocks are often amplified by *stressors* – factors not necessarily related to the shock itself, but which reduce the ability of a social system to cope and recover.

Resilience is a social system's ability to minimise the effect of a shock and recover in its aftermath. When faced with a shock, systems will first attempt to limit the direct impact on their sub-systems. This is known as *coping capacity* and has been defined by the UN as "the ability of people, organizations and systems, using available skills and resources, to manage adverse conditions, risk or disasters[16]."

High levels of resilience mean national systems have superior coping capacity in terms of physical infrastructure, regulatory frameworks, economic strength and diversification, emergency preparedness and response systems[17]. In addition, they also have superior capacity to rebuild their socio-economic systems in the aftermath of the shocks.

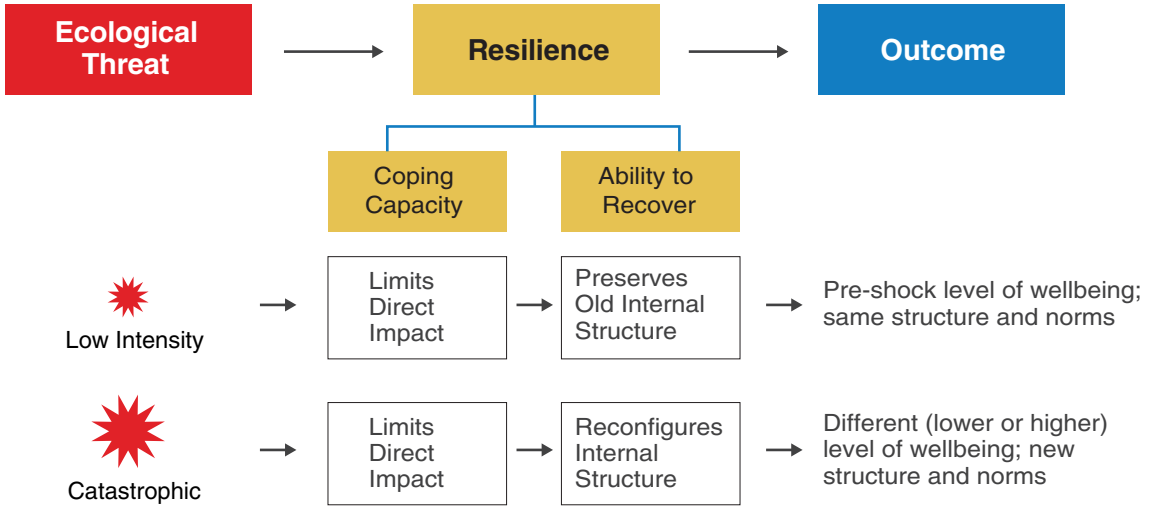
For small to moderate shocks, the social system will limit the negative repercussions on the population and the economy, while the recovery will lead to a return to pre-shock levels of wellbeing and the system may reorganise to be better prepared for future shocks. However, if the shock is severe enough, a system may reconfigure its internal structure. This may mean that the resulting structure is less stable and contains less capacity. This can mean that the next shock will have a more destabilising impact on the system, thereby causing a vicious cycle where a weakened societal system creates a higher likelihood of future shocks. This is particularly evident in countries where the capacity of the government to provide services is lacking. The concept of resilience is illustrated in Figure 3.1.

In contrast, a highly resilient system struck by a shock can reconfigure to become a more resilient system and more capable of dealing with future shocks. The 2011 Great East Japan Earthquake (GEJE) and tsunami set off a chain of direct and indirect impacts felt at the societal and economic level in Japan but also at the international level, affecting global supply chains. While the GEJE was undoubtedly ruinous, losses were reduced due to Japan's disaster risk management strategies, such as earthquake warning systems[18]. Since 2011, Japan has reconfigured its internal structure to strengthen its resilience to low probability, high impact threats by creating resilience policies that emphasise the holistic and continuous approach to

FIGURE 3.1

Shocks and resilience

Resilience is the ability to protect the population by limiting primary impacts of a shock and to restore the system, sometimes to higher levels of wellbeing.



Source: IEP

resilience that should be engaged with even during times of stability[19].

Positive Peace is an effective predictor of socio-economic resilience for countries and regions, as discussed in previous IEP research[20]. This is because societies that operate with high levels of Positive Peace tend to:

- be more effective in protecting lives and livelihoods from the impact of natural disasters;
- recover more rapidly from economic crises;
- adjust more easily and quickly to technological, business, and social disruption; and
- promote the peaceful resolution of grievances and disputes between citizens and groups.

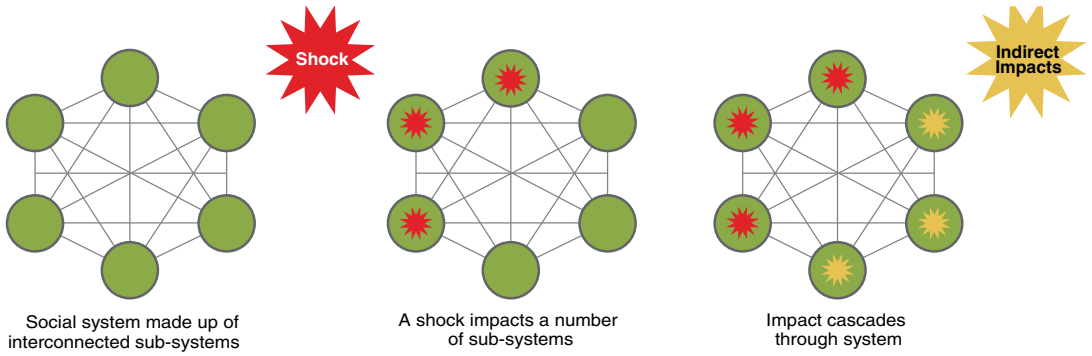
These shocks occur with broadly the same frequency across countries with all levels of peace. However, countries with very low levels of Positive Peace have a fatality rate seven times higher than those with very high levels of Positive Peace. This happens because the Pillars of Positive Peace work in systemic ways to enhance a country's coping capacity. *Sound Business Environment* guarantees enough resources and infrastructure assets to treat people affected by the disaster and repair physical damage. *Equitable Distribution of Resources* means that all individuals, groups and demographics have access to protective infrastructure, equipment and services. A *Well-Functioning Government* allocates resources efficiently and transparently to groups or areas where they are most needed, and so on. When it first manifests, a shock may impact only some of the country's sub-systems directly. In time, however, the interconnectivity between sub-systems re-transmits the ramifications of the shock throughout the country. This pattern is illustrated in Figure 3.2.

The Japanese tsunami of 2011 offers one example of a shock transmission through sub-systems. In its direct impact, the disaster caused death and destruction in the north-eastern coast of the country. Subsequently, damaged nuclear power plants in

FIGURE 3.2

The direct and indirect impact of system shocks

A shock impacts system components in different ways. After the initial impact, the shock cascades through the system.



Source: IEP

the region contaminated crops and water supplies with radiation, affecting health and food production sub-systems in surrounding areas[21]. However, as resilience is strong in Japan, the country recovered and reconfigured its systems to be better prepared for future severe shocks.

In contrast, the 2010 earthquake in Haiti caused severe loss of life and widespread destruction. After the immediate impact, the country experienced a breakdown of its law and order infrastructure contributing to civil unrest and looting[22]. Subsequently Haiti societal systems never fully recovered; the system was further degraded and remains so today, meaning that future shocks are likely to further degrade the country.

This divergence between the experiences in Haiti and Japan can be attributed to the substantial difference in resilience levels between the two. Haiti, ranked in the bottom 20 countries in the Positive Peace Index, and exhibited markedly low resilience, while Japan, among the top 20 countries, shielded its citizens from the disaster's worst effects and facilitated post-disaster socio-economic restoration. Thus, the more severe threats a country faces are and the lower its levels resilience, the more fragile the country is.

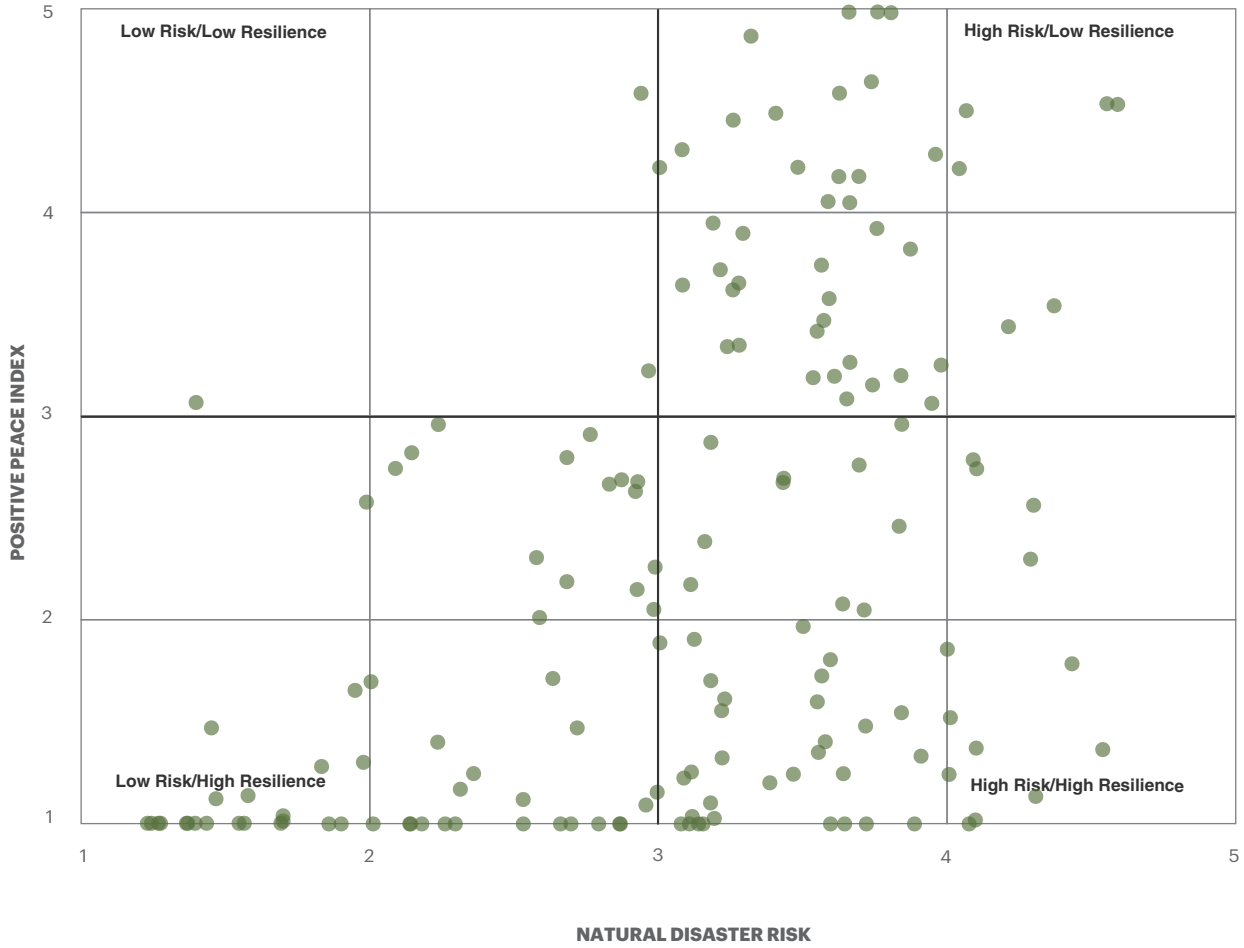
Disasters and Resilience

Figure 3.3 shows the relationship between the Positive Peace Index, a measure of resilience, and a country's susceptibility to natural disasters. While most countries, irrespective of their resilience level, face a low risk of natural hazards, 44 countries exhibit both high disaster risk and low resilience, meaning they are unlikely to be able to cope following an extreme ecological event, and more likely to the risk of suffering from a serious ecological disaster.

FIGURE 3.3

Positive Peace Index score vs natural disaster score

Of the 221 countries in the ETR, 44 have both low levels of resilience and a high risk of natural disasters.



Source: IEP Calculations

4 Systems Thinking and Peace Trajectories

This section demonstrates how the concepts and approaches of systems thinking can be applied to make informed projections about the future behaviour of national systems in relation to their peace and development. It analyses the Positive Peace factors associated with transitions in peace.

The research highlights the most important factors, which vary depending on the prevailing state of peace and the country's level of development. It uses systems thinking to describe the dynamics of how countries operate and how Positive Peace affects their Global Peace Index (GPI) scores and trends.

A central question behind understanding national systems is what makes countries transition from one level of development and peace to another. To answer this, IEP assesses both the GPI and the Positive Peace Index (PPI) to identify different characteristics of national systems and how they operate at varying levels of peacefulness.

The analysis in this section focuses explicitly on peacefulness, as gauged by the internal peace component of the GPI. However, similar dynamics apply to social and economic development. Indeed, countries that develop in the PPI and the GPI tend to progress also in economic prosperity, wellbeing and development.

Positive Peace Deficits as a Predictor of Violence

Comparing changes in the PPI with the GPI over time highlights that improvements in Positive Peace generally precede improvements on the GPI and vice versa.

Countries that have a higher rank on the GPI than in Positive Peace, as measured in the PPI, are said to have a 'Positive Peace deficit'. This is where a country records a higher level of peacefulness than can be sustained by its level of socio-economic development. Most countries found to be in deficit subsequently record increasing levels of violence. Similarly, if a country has a higher Positive Peace score than its GPI rank then it is considered to have a 'Positive Peace surplus' and is more likely to improve its ranking on the GPI.

For the period from 2009 to 2023, 90 per cent of the countries with the largest Positive Peace deficits recorded substantial falls in peace, while 53 per cent of countries with substantial Positive Peace surpluses recorded improvements over the same period. If the Americas were excluded, then the model would have yielded a higher percentage of improvements at 80 per cent.

Additionally, of the Positive Peace surplus countries that did improve on the GPI, the average improvement was large. Of those countries the average improvement was 5.5 per cent, compared to an overall deterioration in the GPI internal peace of 4.5 per cent. Given the strong statistical connection between the improvements in the macro-economic environment and peace, these countries would most likely provide superior financial returns for investors.

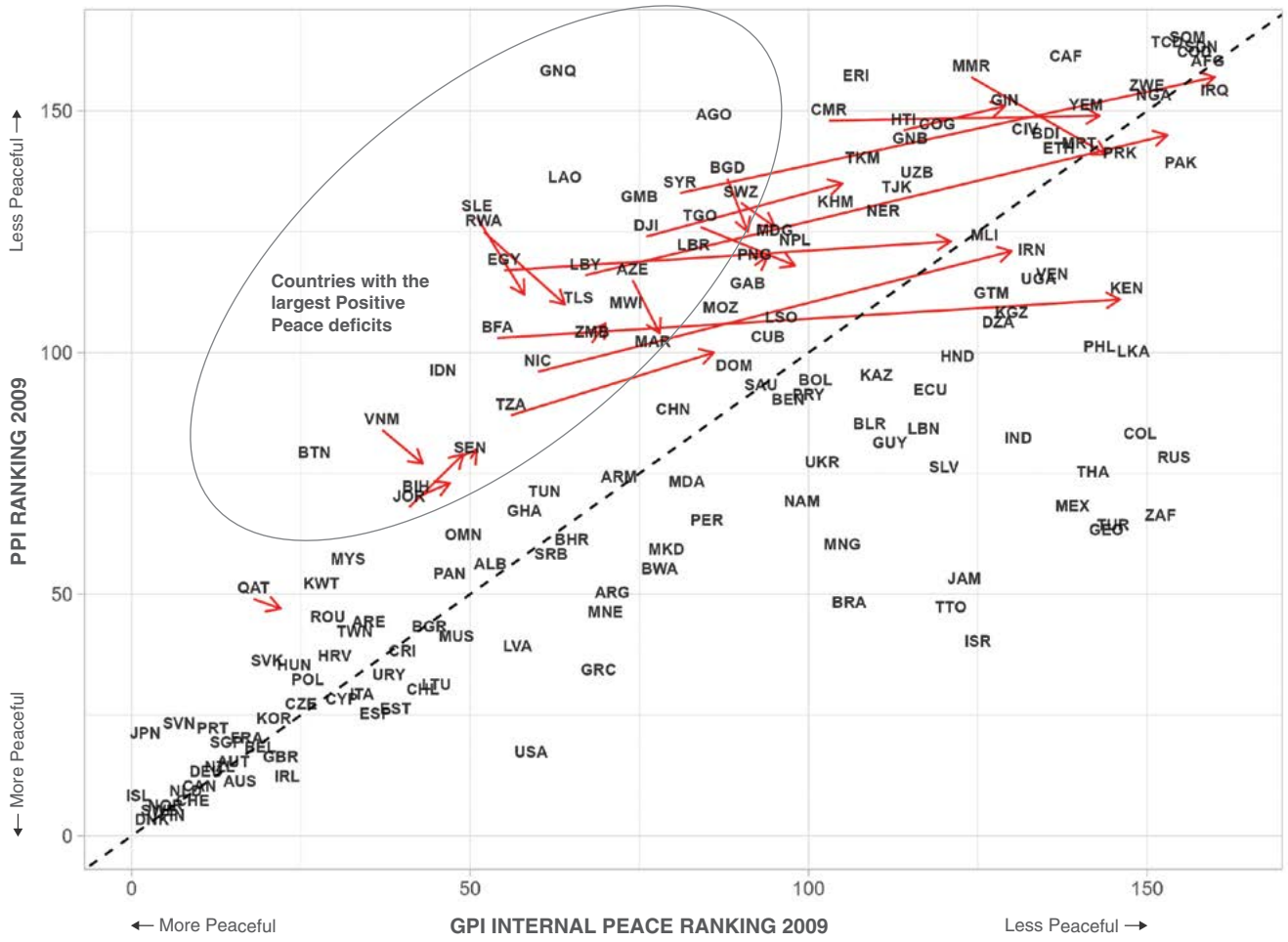
Positive Peace is an excellent measure of societal resilience and as such is a good indicator of future changes in peace because when countries have higher peace than their socio-economic indicators suggest then shocks, whether internal or external, are more likely to have a severe impact on the societal system resulting in violence or conflict. Similarly, countries with the inverse, Positive Peace surpluses are more likely to improve their peacefulness over time because the societal system has the inbuilt systemic dynamics to reduce violence and conflict within the country. As peace is strongly associated with superior economic performance, these countries are likely to represent good opportunities for future investment.

Figure 4.1 shows that most countries with large deteriorations in the GPI from 2009 to 2023 had Positive Peace deficits. The diagram in the figure plots the changes in the position of countries on both the PPI and GPI from 2009 to 2023. The red arrows represent the changes in countries that deteriorated on the GPI. Nearly all countries that deteriorated on the GPI also deteriorated on the PPI. Countries high in both Positive Peace and the GPI cluster towards the bottom left-hand side of the graphic, while countries that are poor in Positive Peace and on the GPI cluster towards the top right-hand side.

FIGURE 4.1

Largest deteriorations in the Global Peace Index, 2009–2023

The higher the GPI rank is in relation to Positive Peace, the more likely a deterioration in peace. A Positive Peace deficit is where the GPI rank is much higher than the PPI rank.



Source: IEP

Expanding on Figure 4.1, countries can be grouped into these three categories:

- **Positive Peace deficit:** when countries rank at least 20 places higher on the GPI than the PPI.
- **Positive Peace surplus:** when countries rank at least 20 places lower on the GPI than the PPI.
- **Stable**: countries have a rank difference between the GPI and PPI of less than 20 places.

Countries in Positive Peace deficit are those with a level of socio-economic resilience that is inferior to and incompatible with the country's actual peacefulness. Positive Peace deficit countries are sometimes ruled by strict regimes that suppress individual freedoms and socio-economic development, but which maintain artificially high levels of peace by forcefully imposing social order. This state of peacefulness is fragile because underlying social tensions and grievances may be simply smothered instead of being heard and resolved. Once there is any weakness in the government or security apparatus, the situation can often deteriorate into violence as a result of protests, civil unrest or inter-group tensions eventually flaring up.

One illustration of this process is Libya, which in 2009 held a PPI rank of 115, or 57 places behind its GPI placing of 58. During the early 2010s, Libya witnessed significant political and social changes. The country experienced the Libyan Revolution of 2011 as part of the broader Arab Spring movement. This period was marked by country-wide protests, violent unrest, and the eventual fall of the Libyan government. These events led to the rise of various groups within the country, including the National Transitional Council and anti-Gaddafi forces, as they competed for control amidst the ongoing turmoil. The aftermath of these events had a lasting impact on Libya's political landscape, leading to an extended period of instability and conflict within the country. Since 2014, the Libyan civil war has featured competing factions, international interference, and a divided nation. From 2009 to 2023, Libya's GPI internal peace score deteriorated by 46 per cent, and its GPI ranking fell by 53 places.

In some unusual cases, countries have Positive Peace deficits because their societies are relatively non-violent, but still lack a greater degree of economic and technological development. Countries such as Bhutan, the Gambia and Bangladesh are possible examples for this category. Despite substantial Positive

Peace deficits in 2009, Bhutan's internal peace scores improved noticeably over the 2009-2023 period and Bangladesh's and the Gambia's remained almost unchanged.

However, in most cases the peacefulness enjoyed by countries with Positive Peace deficits will deteriorate over time. Like Libya, these countries lack the socio-economic resilience that would allow them to absorb negative shocks without falling back into turmoil[23] and violence. These countries generally lack the social infrastructure – such as representative governments, transparent and accessible legal systems, free press and other factors – that would allow internal groups to resolve their grievances through non-violent means.

Of the 30 countries with highest Positive Peace deficits in 2009, 27 countries or 90 per cent, recorded deteriorations in the GPI internal peace score by 2023. This is shown in Table 4.1. Many of the most extreme examples of countries collapsing into violence over the 2009-2023 period – countries such as Syria, Libya, Yemen, Timor-Leste, Egypt, Burkina Faso and others – were deficit countries in 2009.

TABLE 4.1

Positive Peace deficits in 2009 and changes in the GPI from 2009 to 2023

Of the 30 countries with highest Positive Peace deficit in 2009, 27 – or 90 per cent – recorded deteriorations in peace in the 2009-2023 period.

Country	PPI Rank 2009	GPI Internal Peace Rank 2009	Positive Peace Deficit 2009	Change in GPI Internal Peace 2009-2023 (%)	Change in GPI Internal Peace 2009-2023
Equatorial Guinea	154	68	86	6.6	Deterioration
Laos	133	48	85	7.5	Deterioration
Angola	146	66	80	6.4	Deterioration
Sierra Leone	127	59	68	1.8	Deterioration
Rwanda	124	62	62	4.4	Deterioration
Burkina Faso	102	44	58	75.5	Deterioration
Gambia	129	72	57	-0.8	Improvement
Libya	115	58	57	53.8	Deterioration
Egypt	116	60	56	25.3	Deterioration
Eritrea	153	100	53	4.5	Deterioration
Timor-Leste	108	55	53	1.9	Deterioration
Indonesia	93	45	48	7.4	Deterioration
Myanmar (Burma)	155	107	48	36.3	Deterioration
Syria	132	84	48	69.4	Deterioration
Vietnam	84	39	45	0.7	Deterioration
Madagascar	122	78	44	0.4	Deterioration
Eswatini	130	86	44	19	Deterioration
Togo	125	81	44	11.9	Deterioration
Bhutan	77	34	43	-11.3	Improvement
Malawi	107	65	42	8	Deterioration
Djibouti	123	82	41	14.4	Deterioration
Azerbaijan	114	74	40	1.9	Deterioration
Haiti	145	108	37	27.1	Deterioration
Zambia	101	67	34	4.2	Deterioration
Bangladesh	135	103	32	-0.9	Improvement
Liberia	119	87	32	2.3	Deterioration
Kuwait	50	19	31	17	Deterioration
Nepal	120	90	30	1.3	Deterioration
Morocco	99	70	29	2.1	Deterioration
Bosnia & Herzegovina	70	42	28	8	Deterioration

Source: IEP

It is not just the proportion of deteriorations that is higher among deficit countries. The extent of such deteriorations is also materially greater for deficit countries than any other category. Deficit countries that fell into further violence from 2009 to 2023 saw their GPI internal peace scores deteriorate by 11 per cent. This compares to a four per cent deterioration for the median country.

Taken together, the proportion of deteriorations among deficit countries and the size of such deteriorations show that the Positive Peace deficit model is a good predictor of future deteriorations in peace.

TABLE 4.2

Countries with Positive Peace deficits in 2023

Countries in this list are more likely to experience increasing levels of violence over the next decade.

Country	PPI Rank	GPI Internal Peace Rank	Positive Peace Deficit
Equatorial Guinea	154	73	81
Angola	138	72	66
Laos	117	57	60
Eritrea	156	101	55
Liberia	133	81	52
Sierra Leone	112	61	51
Madagascar	116	66	50
Cambodia	119	71	48
Guinea-Bissau	143	96	47
Gambia	108	62	46
Rwanda	110	65	45
Bangladesh	125	86	39
Bhutan	61	23	38
Zambia	106	68	38
Azerbaijan	104	67	37
Timor-Leste	92	56	36
Vietnam	77	42	35
Jordan	79	47	32
Congo - Brazzaville	147	116	31
Djibouti	135	104	31
Morocco	95	64	31
Nepal	113	83	30
Malawi	105	77	28
Indonesia	81	54	27
Senegal	80	53	27
Turkmenistan	132	105	27
Qatar	47	21	26
China	67	43	24
Tanzania	100	76	24
Guinea	150	127	23

Source: IEP

The Positive Peace deficit model can be seen as one tool, among others, that stakeholders and supranational agencies could use to anticipate and prepare for possible increases in violence in the future. Table 4.2 displays the 30 countries in Positive Peace with the largest deficits in 2023. It is possible that most of these countries will experience higher levels of violence over the next decade or so.

Of particular concern, Eritrea combines a large Positive Peace deficit with a long-deteriorating trend in the PPI since at least 2009. The country saw its PPI overall score deteriorate by two per cent over the 2009-2023 period and recorded deteriorations in five out of the eight Pillars of Positive Peace.

Over the past five years, other countries recorded substantial PPI deteriorations, which reversed previous gains earlier in the 2009-2023 period. This is the case for Equatorial Guinea, Azerbaijan, Qatar, Bangladesh, Turkmenistan, China, Morocco, Vietnam, Laos and Indonesia. These countries are also at higher risks of increases in violence.

Positive and Negative Peace Dynamical System Model

These findings indicate that future levels of peace in any country depend on the interplay between the levels of Positive Peace and negative peace. Certain combinations of Positive and negative peace appear to be more stable than others, while some specific configurations have historically been unstable. Countries that rank near the boundaries between stability and instability are susceptible to tipping points where small disturbances can lead to radically different peace trajectories.

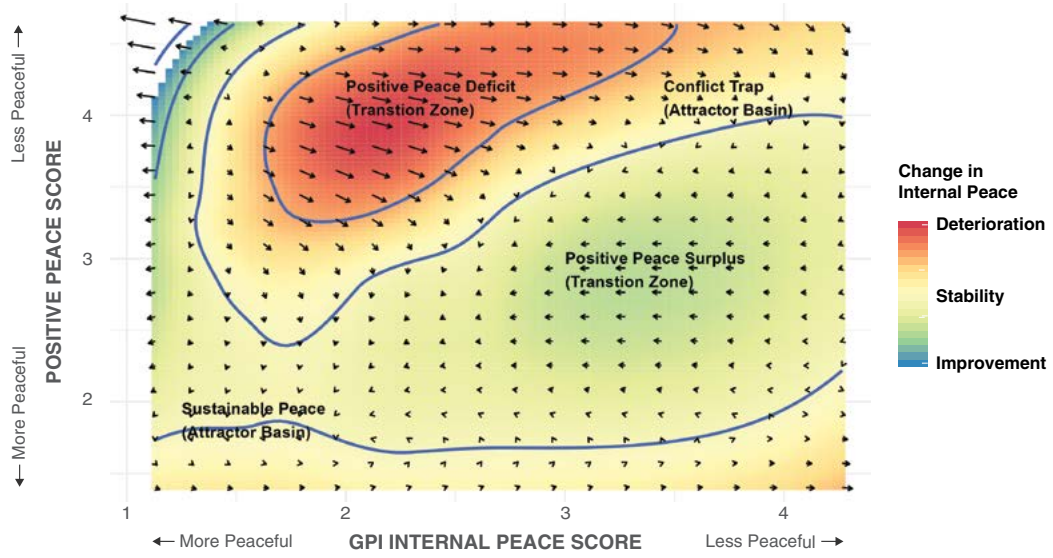
The eight Pillars of Peace represent a system of factors that interact to create and sustain peaceful societies. However, the efficacy of these Pillars depends on the context of violence in which they operate. For example, Europe – currently the most peaceful region in the world – has highly evolved and developed effective Positive Peace mechanisms to address grievances. However, this is the result of centuries of development with slippages into violence. Violence and Positive Peace co-evolve and as such operate as a system.

By tracking changes in the GPI and the PPI for all countries over the 2009-2023 period, it is possible to build a dynamical systems model of peace transitions. Figure 4.2 shows the outputs of this model.

FIGURE 4.2

IEP dynamical system of GPI and PPI trajectories

Based on empirical evidence, negative and Positive Peace change more rapidly depending on starting levels in the PPI and GPI.



Source: IEP

The diagram has areas of red and blue. The arrows highlight the likely shifts over time based on the historical performance of the countries from 2009 to 2023. Red areas represent combinations of Positive Peace and negative peace that have been historically unstable leading to large future deteriorations in the GPI score. In 2009, Syria, Libya, and Egypt were all in this region and have since had large deteriorations in the GPI. Countries in the blue-coloured region on a given year have tended to have subsequent improvements in the GPI. Areas of yellow have shown relatively little movement over the period. The large yellow area in the bottom-left of the figure represents states where the combinations of high Positive Peace and negative peace tend to be more stable. In systems theory there is a concept known as attractor basins. This is where a country arrives at a position from which it is hard to change. Both the combinations of high PPI and GPI scores and low GPI and PPI scores are attractor basins.

This can be seen as a 'Sustainable Peace' region, characterised by institutional stability and societal wellbeing[24]. Conversely, the top-right corner represents states with low levels of both negative and Positive Peace. This region can be called the 'Conflict Trap'.

This graphic is commonly known as a phase plane and is a representation of potential transitions between states of a system. There are areas of stability where the system operates with little change over the period. These are represented by the yellow areas with very short arrows, signifying that they are the attractor basins. As countries approach these regions they tend towards periods of stability. Areas of rapid change – represented by long arrows – are referred to as transition regions. Points on the boundary between attractor basins and transition regions are highly sensitive, with even small fluctuations sometimes leading to widely different development paths.

In the phase plane above, the regions labelled Sustainable Peace and Conflict Trap act as attractor basins for countries. Countries can fall into the Conflict Trap region rapidly. The historical data, however, suggests that through strengthening Positive Peace, countries over time tend towards the Sustainable Peace region. In the period of analysis, no country in the Sustainable Peace region has seen a large deterioration in the GPI. There are also large areas, coloured yellow, where change is gradual. These are large areas, reflecting that change of countries in these regions has been small over the period of analysis. If the analysis were repeated for multiple decades or even centuries, the areas with the least change would likely concentrate around the Sustainable Peace and Conflict Trap regions.

By using historical data to build this phase-plane model, IEP's approach is empirically derived and does not need to make assumptions about how individual components of the system behave.

Standard dynamical systems modelling relies on assumptions on how individual components of the system behave. This approach to modelling is useful in the study of engineering or biological systems, where researchers can isolate individual components and understand how they behave.

Tipping Points in the Positive and Negative Peace Dynamical System Model

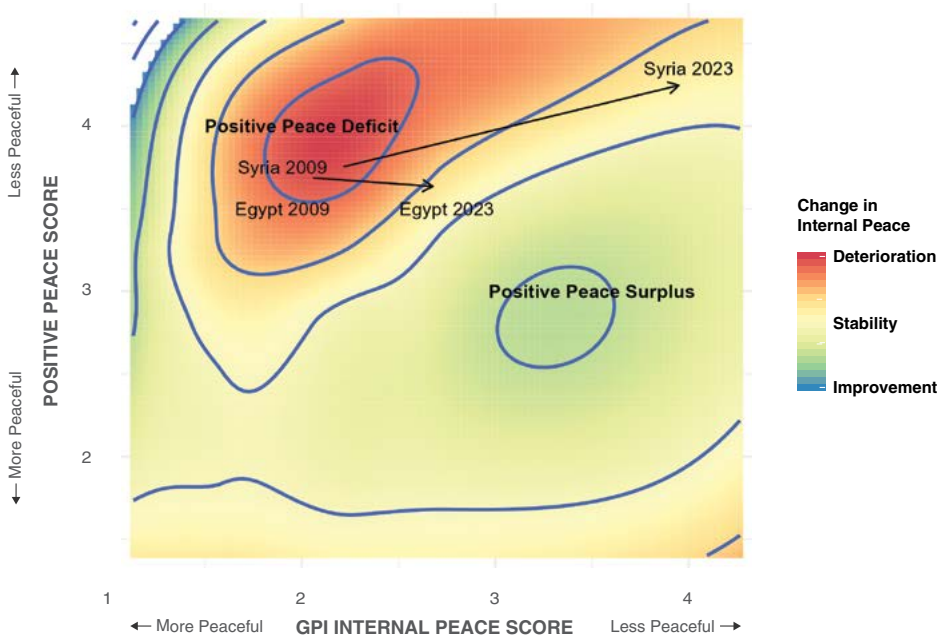
IEP's dynamical model highlights the non-linear behaviour of complex systems. Small differences in the initial conditions of two countries can have large impacts on a country's future pathway towards peace.

Figure 4.3 indicates that countries in the Positive Peace deficit region can work towards sustainable peace by improving Positive Peace. However, they are also at risk of deteriorating into a Conflict Trap. Countries that improve in Positive Peace at different rates in this region may have large divergences from each other. This is highlighted in Figure 4.3, which shows the

FIGURE 4.3

Tipping points in Positive Peace deficit region

Tipping points in the negative and Positive Peace system can result in countries that are relatively close to each other on the PPI and GPI experiencing widely diverging trajectories.

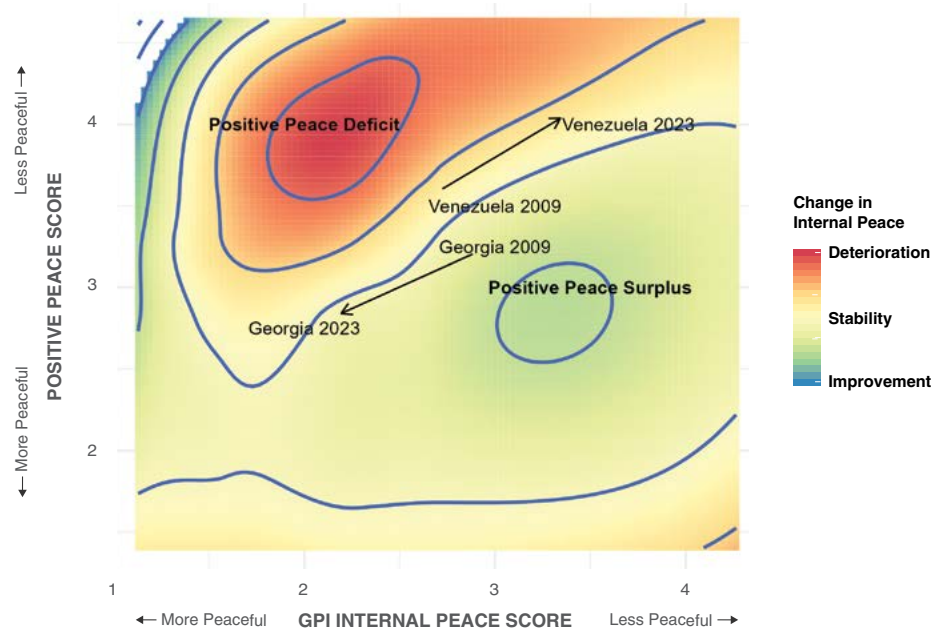


Source: IEP

FIGURE 4.4

Tipping points in the Positive Peace surplus region

Despite starting at a lower level of peacefulness in 2009, Georgia had become significantly more peaceful than Venezuela by 2023.



Source: IEP

divergence in the actual historical paths of Egypt and Syria. While both countries were very close in both PPI and GPI in 2009, their trajectories since have been very different. In this comparison, Syria in 2008 could be thought of as on the verge of a *tipping point* towards a Conflict Trap. In 2009, Egypt scored much better than Syria in *Well-Functioning Government, Low Levels of Corruption* and *Sound Business Environment*.

Tipping points can also be beneficial to a country. Figure 4.4 shows how countries can overtake peers in developing in peacefulness and wellbeing. In 2009, Venezuela was more peaceful than Georgia in terms of internal peace. However, Georgia had stronger Positive Peace. The larger reserves of Positive Peace placed Georgia closer to the region of the phase plane map in which improvements in the GPI are generally produced. By 2023, Venezuela had substantially deteriorated in the GPI while Georgia had substantially improved. In the Global Peace Index Report 2023, Georgia was ranked 94th, while Venezuela received a dismal ranking of 140 out of 163 countries.

This also highlights the significance of shocks to a country. A shock can push a country from a current trajectory into another region of the phase plane. If any country experienced a shock that pushed it closer to the Positive Peace deficit region, it could alter its path from one tending toward Sustainable Peace to one tending toward a Conflict Trap.

Systems Dynamics Model and Prediction of Most Recent Coups in Africa

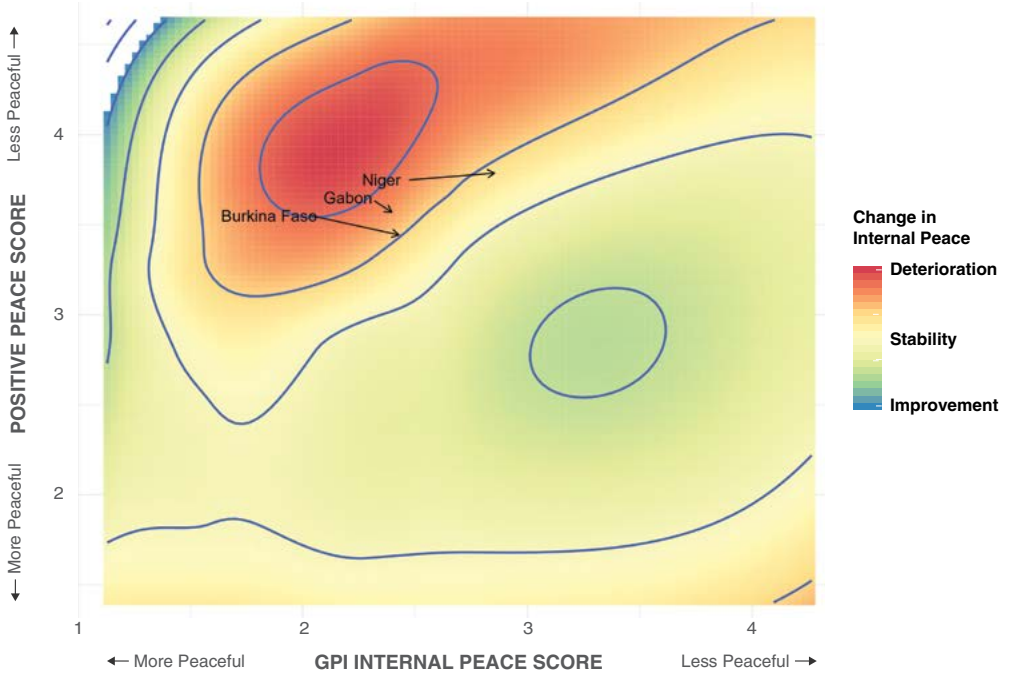
In the last three years, sub-Saharan Africa has witnessed a notable increase in coup attempts. Among numerous efforts, there have been eight that have resulted in the successful seizure of power since 2020[25]. In 2022 alone, Burkina Faso experienced two coups, while Gabon and Niger have each experienced one in 2023. It is worth noting that, historically, these three countries have exhibited low levels of Positive Peace, although they did not necessarily suffer from high levels of internal violence.

Looking back to 2017, these three countries were situated within or near the Positive Peace deficit area on the phase plane map, an area known for being susceptible to a significant decline in internal peace (Figure 4.5). This estimation, based on data from 2009 to 2017, predicted a deterioration in internal peace for Burkina Faso, Gabon, and Niger in the years to come. The arrows on the map represent the actual decline in internal peace from 2017 to 2023. It is evident that the phase plane mapping of these countries was highly predictive of the real outcomes, though the real deteriorations in internal peace in Burkina Faso and Niger have been much more substantial than in the deterioration that has taken place in Gabon.

FIGURE 4.5

Prediction of 2022-2023 military coups in Africa

Using data from 2009 to 2017, the model accurately predicts a significant deterioration in internal peace within three countries that would later experience military coups in the 2022-2023 period.



Source: IEP

5 The Intent of Countries

All countries are made up of conscious human beings, with each person having their own intent, many of which are subconscious, unspoken, or implicit. Since countries are collections of individuals, countries will also have their own unique intents. Additionally, the intent of countries is not equally set by all individuals, as those with power will have more influence than those that do not. The country's path dependence will also influence the intent. For example, a country's economic system or government type reflect historical legacies but may also align with views held by the majority of citizens.

The intent of countries, however, is not well understood. Although international affairs is a well-researched subject, there is relatively little quantitative research in this area. To address this shortfall, IEP has derived a quantitative methodology consisting of four dimensions:

- Political – from authoritarian to democratic
- Economic – from closed market to open market
- International Relations – from unilateralism to multilateralism
- Social Policy – from low safety nets to high safety nets

Table 5.1 outlines the scales on which countries have been classified for each of these dimensions.

Although these four dimensions represent a simplification, they were chosen because of the important role each plays within a society. Each dimension can be seen as being the outcome of the interactions of many other systems within the country. Through understanding the countries which are most similar, it is possible to identify the countries where soft power is most likely to be effective. Analysis of intent can also provide an indication of citizens' receptivity to alliances with other countries and which countries are most likely to form cooperative relations with one another. The more the countries are similar, the more likely citizens will be accepting of alliances with these counties, and if problems do arise then there are cultural avenues to help in finding a solution. The analysis can also be used to understand which countries' policies are likely to be similar; therefore, the good policies are more likely to be replicable and the possibility to learn from failed policies before they are introduced.

Changes in intent can best be seen in times of crisis. When the encoded norms around security or economic prosperity are threatened, people may be willing to accept a shift towards

TABLE 5.1

IEP's four scales of intent

Intent is classified as the combination of four scales of intent: economic, political, international relations and social policy.

Intent Pillar	Indicator	Description	Source
Economic	Economic freedom	The Economic Freedom of the World report ranks countries based on five areas: size of government, legal structure and security of property rights, access to sound money, freedom to trade internationally, and regulation of credit, labour and business.	Fraser Institute
Political	Political Democracy Index	Political Democracy Index	EIU
International relations	Number of treaties ratified	Number ratified out of Law of the See, Paris Climate Change Agreement, Non-proliferation of nuclear weapons, and Human Rights Treaties or Membership to the EU.	UN
Social Policy	Social spending as % of GDP	Social spending as % of GDP	OECD and World Bank

authoritarianism in return for stability. Hyperinflation in Germany in the 1920s offers a historical example of such an interplay[26].

Table 5.2 describes the correlations between the four variables and shows that, while the political, economic and social policy indicators are strongly related to each other, the international relations indicator is not.

TABLE 5.2

Correlations between IEP's four scales of Intent

	Economic	Political	International relations	Social Policy
Economic	1	0.54	0.06	0.43
Political	0.54	1	0.36	0.63
International relations	0.06	0.36	1	0.27
Social Policy	0.43	0.63	0.27	1

Every country can be classified on a continuum for each dimension. Figure 5.1 shows how each country could be plotted on these scales and how they can then be classified. Country A would be described as tending toward authoritarianism, state ownership of the economy, with high safety nets and levels of international collaboration. Country B, on the other hand, would be described as tending towards democracy, an open economy, with low safety nets and international cooperation.

Clustering on Intent

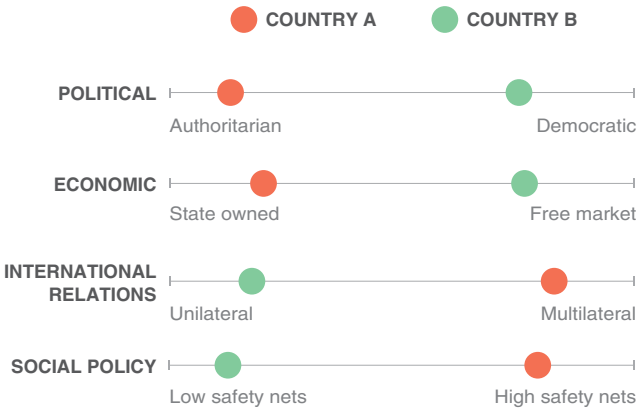
Looking at which countries are similar on their intent scores produces a cluster of countries. It would seem intuitive that the more closely two countries are placed together on the four scales of intent, the more aligned they are in their behaviours. Box 5.1 explains the process IEP has developed to compare the intent of countries to identify clusters of similar countries.

Extending this analysis further, Table 5.3 shows the number of countries that each country can consider as similar. When three or more dimensions have similar scores then countries are considered similar.

FIGURE 5.1

Plotting country intent

Intent for each country can be classified based on its position on the four scales of intent.



Source: IEP

BOX 5.1

National intent: defining "similar" countries

Each country has its own unique location on each of the four intent scales.

Two countries may be similar on one intent scale, but not others. For example, the open economy of Qatar is similar to those of Europe and the US and so scores similarly on the economic intent scale. However, on the remaining three intent scales Qatar scores much closer to its regional neighbours. To build groups of countries with similar intents requires knowing how similarly they are positioned on the four dimensions. The more scales on which two countries score similarly, the closer IEP classifies these countries. The steps for doing this are:

- Select Country A
- Create lists of the 20 most similar countries to Country A in the four national intent dimensions (e.g., those countries that lie within 10 places either side of Country A's ranking in any given dimension).
- Identify which countries are similar in at least three of the four intent scales.

TABLE 5.3

Number of similar countries in intent

Western Democracies have more countries with similar intent. Less developed countries tend to be more unique in the location on the four intent scales.

Country	Number of countries similar in ≥ 3 intent scores
Australia	8
Estonia	7
Netherlands	7
Canada	6
Switzerland	6
Germany	6
United Kingdom	6
Ireland	6
Iran	6
Czech Republic	5
Portugal	5
Sudan	5
United States	5
Austria	4
Cote d'Ivoire	4
Italy	4
Nepal	4
New Zealand	4
Belgium	3
Democratic Republic of the Congo	3
Denmark	3
Algeria	3
Ecuador	3
Eritrea	3
Spain	3
Finland	3
The Gambia	3
Israel	3
Japan	3
Liberia	3
Montenegro	3
Namibia	3
Norway	3
Poland	3
Syria	3
Angola	2
Albania	2
United Arab Emirates	2
Belarus	2
Brazil	2
Chile	2
Cameroon	2
Republic of the Congo	2
Egypt	2
France	2
Guinea-Bissau	2
Guyana	2
Indonesia	2
Kenya	2
Kyrgyz Republic	2
Korea	2
Libya	2
Sri Lanka	2
Lesotho	2
Latvia	2
Moldova	2
Mali	2
Myanmar	2
Mozambique	2
Mauritania	2
Mauritius	2
Philippines	2
Qatar	2
Slovakia	2
Sweden	2
Chad	2
Togo	2
Tanzania	2
Uganda	2
Benin	1
Burkina Faso	1
Bangladesh	1
Bulgaria	1
China	1
Costa Rica	1
Cyprus	1
Djibouti	1
Ethiopia	1
Gabon	1
Ghana	1
Guinea	1
Guatemala	1
Croatia	1
India	1
Iraq	1
Iceland	1
Jordan	1
Cambodia	1
Kuwait	1
Laos	1
Lebanon	1
Morocco	1
Mexico	1
Macedonia	1
Malawi	1
Nicaragua	1
Peru	1
Papua New Guinea	1
Paraguay	1
Russia	1
Rwanda	1
Saudi Arabia	1
Senegal	1
Sierra Leone	1
Swaziland	1
Thailand	1
Tajikistan	1
Tunisia	1
Ukraine	1
Uruguay	1
Venezuela	1
Viet Nam	1
Yemen	1
South Africa	1
Zambia	1
Zimbabwe	1
Argentina	0
Armenia	0
Azerbaijan	0
Burundi	0
Bahrain	0
Bosnia and Herzegovina	0
Bolivia	0
Bhutan	0
Botswana	0
Central African Republic	0
Colombia	0
Dominican Republic	0
Georgia	0
Greece	0
Honduras	0
Haiti	0
Hungary	0
Jamaica	0
Kazakhstan	0
Lithuania	0
Madagascar	0
Mongolia	0
Malaysia	0
Niger	0
Nigeria	0
Oman	0
Pakistan	0
Panama	0
Palestine	0
Romania	0
Singapore	0
El Salvador	0
Serbia	0
Slovenia	0
Timor-Leste	0
Trinidad and Tobago	0
Turkey	0

As shown in Table 5.4, Australia is the country that is similar to the most other countries according IEP's intent clusters. The table shows that Australia is similar to eight countries in Europe, the Commonwealth and North America. Listing groups of similar countries, Table 5.2 highlights that each country will have its own unique list of similar countries.

One of the more interesting findings of this analysis is that, as countries become more developed, they become more alike. Conversely, less developed countries are more unique in that there are fewer countries that can be considered similar on the intent scales. This highlights the importance of path dependence to the national system. Even where the destination of development is defined, each country's path of progress starts at a different and unique starting point. This is illustrated in Figure 5.2.

TABLE 5.4

Example of IEP's intent clustering

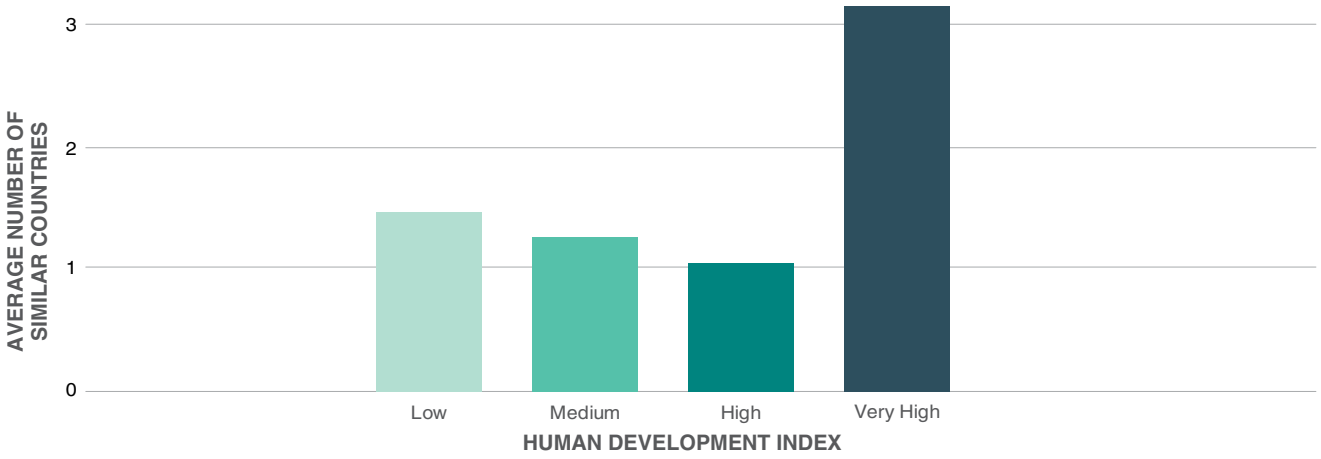
Each country in IEP's intent clustering will have its own unique list of countries that can be considered "similar". The countries listed are similar on at least three dimensions of intent.

	BASE COUNTRY						
	Australia	**Canada**	**United Kingdom**	**Germany**	**Iran**	**United States**	**Italy**
Is similar to...	United Kingdom Ireland Canada Switzerland Estonia Netherlands New Zealand United States	Switzerland Australia Ireland Iceland Mauritius New Zealand	Australia Switzerland Estonia Ireland Netherlands United States	Finland Austria Belgium Denmark Netherlands Sweden	United Arab Emirates Democratic Republic of the Congo Eritrea The Gambia Sudan Syria	Australia Estonia United Kingdom Israel Netherlands	Spain France Portugal Uruguay

FIGURE 5.2

Intent and development

As countries develop, they become more alike. However, developing countries tend to be more unique. This helps to highlight that no country's progress through development can be identical.

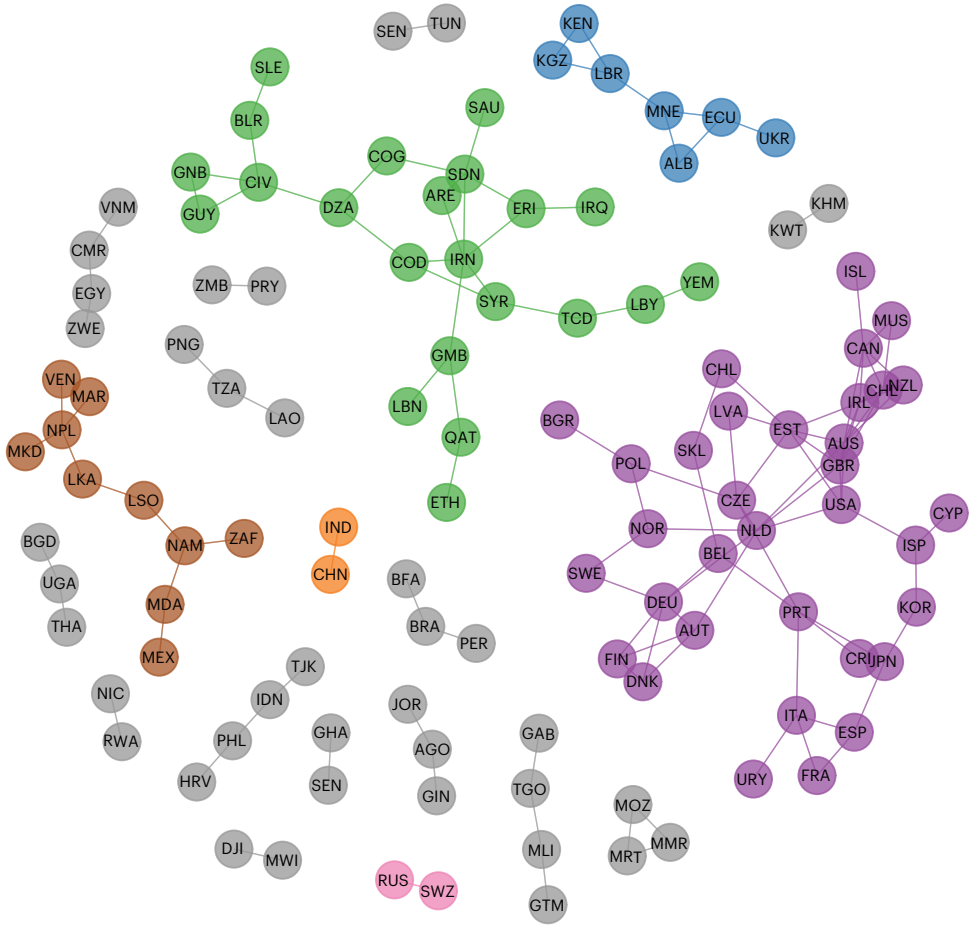


Source: UNDP, IEP

FIGURE 5.3

Natural clusters of intent

Clusters are formed by looking at similarities in intent. The largest group of 34 countries represents Western democracies. The next largest group with 22 countries covers MENA and Africa.



Source: IEP

Using the threshold of being similar on three of the four intent scales, countries can be grouped to form clusters. Figure 5.3 shows these clusters.

The clusters with more than five countries are coloured, along with China and Russia. The largest group with 34 countries can be loosely labelled Western Democracies. The second largest cluster, with 22 countries, spans primarily MENA and the African continent. These clusters are shown geographically in the map presented in Figure 5.4.

The map of Figure 5.4 makes intuitive sense. Western democracies form close alliances with countries across the globe. Other clusters of countries, if they do form clusters, tend to do so with countries within the same region.

Conclusion

This section has introduced a scale for understanding national intent. It has demonstrated how IEP's formulation of intent can approximate the realistic alliances observed in the international system. In doing so the research has also shown that as countries develop, they generally function more similarly to other developed countries.

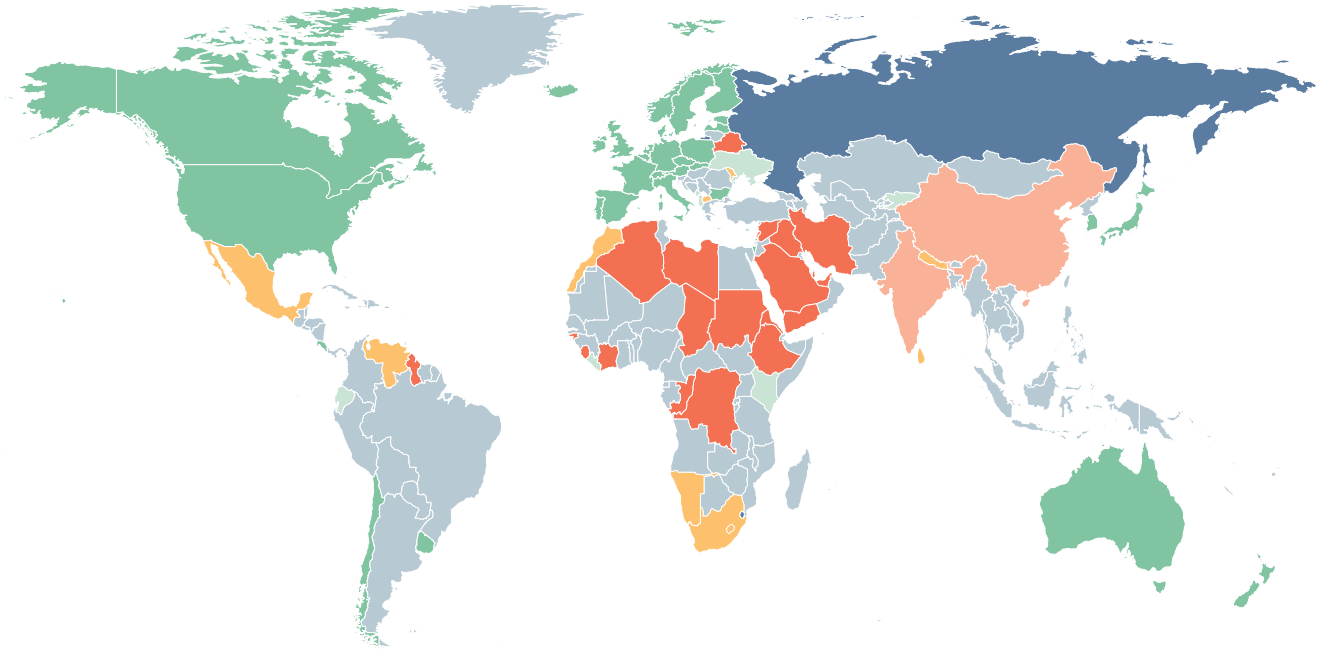
It has also been shown that less developed countries are more unique in their functioning and so while the end goal of development may be known, the path to get there will more likely be different for each country. This has implications for development, suggesting that interventions are likely to be unsuccessful unless the systemic nature of the country state is understood. This is of particular importance given that improving only one of the eight Pillars of Peace, without corresponding improvements in others, can give rise to an increase in grievances.

A greater understanding of the systemic nature of counties offers the potential for better outcomes in peace and development, while minimising the potential for negative unintended consequences. It also offers a better way of understanding the depth of strategic relations between countries.

FIGURE 5.4

Map of intent

Intent forms geographical blocs across the globe.



Source: IEP

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MARCH 2024 / IEP REPORT 94

ISBN 978-0-6451494-7-0