EU-LISTCO

Europe's External Action and the Dual Challenges of Limited Statehood and Contested Orders

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FORECASTING AND FORESIGHT

Methods for Anticipating Governance Breakdown and Violent Conflict

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ABSTRACT

In this paper, we present the evolution and state of the art of both quantitative forecasting and scenario-based foresight methods that can be applied to help prevent governance breakdown and violent conflict in Europe's neighbourhood. In the quantitative section, we describe the different phases of conflict forecasting in political science and outline which methodological gaps EU-LISTCO's quantitative sub-national prediction tool will address to forecast tipping points for violent conflict and governance breakdown. The qualitative section explains EU-LISTCO's scenario-based foresight methodology for identifying potential tipping points. After comparing both approaches, we discuss opportunities for methodological advancements across the boundaries of quantitative forecasting and scenario-based foresight, as well as how they can inform the design of strategic policy options.

1. ANTICIPATING GOVERNANCE BREAKDOWN AND VIOLENT CONFLICT

The EU-LISTCO project researches how a combination of different risk factors in the European Union's neighbourhood contribute to tipping points for governance breakdown and violent conflict at which security threats to the EU and its citizens emerge, and how the EU and its member states can respond (Börzel and Risse 2018). One way to address this challenge is by analysing past instances of violence and breakdown of basic governance services, assuming that a better understanding of the past is a sufficient basis for developing the tools to address future threats. While this traditional way of doing empirical research is important, the future tends to surprise us. The popular uprisings and subsequent conflict across the Middle East and North Africa and the war in Ukraine are two examples of events within the EU's immediate neighbourhood that took both researchers and policy makers by surprise and challenged assumptions about how, when and where security threats emerge.

To address EU-LISTCO's main research question on how different combinations of risk factors and societal resilience as a mitigating factor affect the tipping points at which risks turn into threats, we apply two sets of methods: quantitative forecasting and scenario-based foresight methods. The selection and application of these methods is guided by EU-LISTCO's conceptual framework (Börzel and Risse 2018). The framework starts from the assumption that the EU's neighbourhood is characterized by two main risk factors: limited statehood and contested orders. Limited statehood refers to a state's limited ability to control the use of violence and enforce rules. Contested orders are constellations in which "state and non-state actors challenge the norms, principles, and rules according to which societies and political systems are or should be organized" (Börzel and Risse 2018: 4). Both conditions are ubiquitous and are not in themselves threats to European security, but they are risk factors for violent conflict and governance breakdown which threaten Europe's stability and security.

In this first methodological paper, we answer the questions: (1) What quantitative and scenario-based qualitative methods are available to better anticipate and prepare for future violent conflict and governance breakdown? (2) How can they be combined? To address these questions, we present the state of the art of both methods. In the first part, we give an overview of the quantitative methods available to forecast violent conflict and, to a lesser extent, governance breakdown. After that, we present the scenario-based methods that are available to build a toolkit for foresight processes identifying tipping points for violent conflict and governance breakdown in the EU's neighbourhood. In section four, we take a comparative approach to discuss opportunities to combine quantitative and qualitative approaches, taking into account their strengths and weaknesses when anticipating threats and developing preventive strategies. We show that, despite their different epistemological approaches, there is plenty of room for advancements across the boundaries of both methodologies to support the design of strategic policy options. The concluding discussion summarises the opportunities and challenges at hand and outlines how the research on identifying methods for anticipating governance breakdown and violent conflict contributes to EU-LISTCO's research goals.

2. QUANTITATIVE FORECASTING OF ARMED CONFLICT AND POLITICAL VIOLENCE[1]

Forecasting armed conflict has a long history in political science. Indeed, in his presidential address to the Peace Science Society, J. David Singer (1973:1), one of the pioneers of modern social science, remarked:

> [N]o matter how I turn it over in my mind, the number one task of peace research always turns out to be that of prediction: the ability to forecast, with increasing reliability, the outcomes which are most likely to emerge out of a given set of background conditions and behavioural events. And it seems to me that this holds whether our concern is to aid, augment, bypass, or subvert those who now decide questions of war and peace.

This ambition sparked a broad and thriving literature on forecasting armed conflict. Although the ambition can be traced back to the start of systematic analyses of

[1] This section focuses primarily on the literature geared towards forecasting conflict and political violence. It touches, in section 2.4, on forecasting of some types of governance breakdown, but since this literature is much less developed, it is only briefly considered.

armed conflict, interest in forecasting has waxed and waned over time. In general, efforts at forecasting armed conflict and political violence can be understood as developing across three generations (based on Nygård [2015] and Hegre et al. [2017a, 2018]).

2.1 First Generation

The first generation of conflict prediction was inspired by the work of Sorokin (1962), Richardson (1960a) and Wright ([1942], 1965). It was heavily influenced by the foundational work of J. David Singer and the broad Correlates of War Project in 1963, aiming to systematically accumulate scientific knowledge about war (Small and Singer, 1982). Early-warning purposes were explicitly included among the aims of this effort (Singer and Wallace, 1979). These efforts also included the first attempts at utilizing event type data, often highly granular data of the 'who did what to whom, where, and when' form. Such early events data projects also highlighted forecasting (e.g., Azar et al. [1977]). Pioneering work by Azar (1980) and McClelland and Hoggard (1968) provided templates for collecting fine-grained data sufficiently effective to approximate real-time conflict early warning.

This first enthusiasm for conflict prediction quickly faded, however, as it became clear that the results did not match the initially high ambitions, and, throughout the 1970s and early 1980s, explicit efforts to use statistical models to predict or warn against armed conflict were relatively rare (exceptions do exist, see e.g., Ward [1984] and Zinnes and Muncaster [1984]).

2.2 Second Generation

The second generation of conflict prediction started in earnest in the early 1980s. Two innovations were particularly important in this period: first, the explicit linking of theory and prediction, particularly in the development of game-theoretic models specifically aimed at producing predictions; second, the introduction and development, for social science, of computational methods often more appropriate for forecasting. In terms of linking theory and prediction, Bruce Bueno de Mesquita (1980, 1983, 1984) in particular made explicit the link between theory and conflict prediction by using game-theoretical models to predict armed conflict as well as other foreign and domestic policy events. In terms of developing computational methods, the work of Philip Schrodt (and colleagues) stands out. From the late 1980s, Schrodt has been building statistical models based on extensive news source data to predict armed conflict. Schrodt (1988, 1991) used methods from artificial intelligence and machine learning, including neural networks, to predict state-based conflict, which are now increasingly common in the discipline.

It also became clear that, to provide more effective early warning, the discipline had to make use of more granular data (Schrodt, Davis and Weddle 1994). Schrodt is also a pioneer in moving away from the widely used country-year datasets, constructed from the Correlates of War collection of data and similar sources, to instead use more high-resolution event type data attempts to track 'who did what to whom, where, and when' at as finely-grained temporal and spatial a level as possible. Schrodt, Davis and Weddle (1994) introduced algorithms for automatically classifying and coding political events based on large amounts of news articles. These techniques have since been further refined and now allow the discipline to use increasingly fine-grained data to code both dependent and independent variables. While the country-year format pushed the discipline forward (Beck, King and Zeng 2000; Gurr and Lichbach 1986; Gurr and Moore 1997; Harff 2003), empirical analysis and forecasts alike are increasingly cast on a daily, weekly, or monthly level (e.g., Brandt, Freeman and Schrodt [2011]; Doyle et al. [2014]; Schrodt and Gerner [2000]). This is reflected in the increasing demand for spatio-temporally-disaggregated event data (Cederman and Gleditsch 2009; Weidmann and Ward 2010).

2.3 Third Generation

The focus on early warning and the ambition to see it realised articulated in the second generation of conflict forecasting led to a substantial amount of policy interest in this area. A high-water mark in this respect was the development of the US government-financed State Failure Task Force (SFTF, later re-named the Political Instability Task Force PITF) – which marked the advent of the third generation of conflict forecasting. The goal of the PITF was to predict a wide range of political instabilities ranging from coups and revolutions to armed conflict two years before they occurred. Goldstone et al. conclude that the PITF studies "have substantially achieved that objective" (2010: 204). One of the key insights from the PITF is that simplistic models with a few powerful variables performed just as well as complex models, at least at the country-year level. Beginning in the mid-late 2000s, conflict prediction became a very active sub-discipline of conflict research and is now increasingly seen as a 'mainstream' effort by the wider scientific community (Schneider, Gleditsch and Carey 2011). This push was driven by the ambition to predict in itself, but it was also given additional academic weight by the realisation, most succinctly communicated by Ward et al. (2010) and Schrodt (2014), that prediction is often a better way of evaluating research than more traditional significance and p-value based approaches to testing estimates. In short, a prediction framework allows researchers to assess the extent to which their models, or individual variables, are able to recreate the observed data.

This realisation of some of the fundamental weaknesses of p-value approaches marks a major turn in the third generation of conflict forecasting. We see a clear move away from hypothesis testing using p-values to more and more use of out-of-sample evaluation, which involves splitting the data into several subsets and then using one subset to train the model and other subsets to evaluate it. Out-of-sample methods, developed in particular in the works of Hastie and Tibshirani (2009), are particularly well suited for guarding against overfitting – the tendency to fit data to noise instead of measuring signal. For work purely aimed at theory testing, ensuring that models are not over-fitted is an important concern. For efforts directly aimed at forecasting and early warning, however, it is absolutely fundamental. Out-of-sample methods have thus today become a staple methodology for researchers doing conflict forecasting.

Over the same period, we have also seen important methodological innovations. These include, in particular, the use of ensemble methods and tree-based approaches. Ensemble methods, routinely used in meteorological forecasting, work by leveraging a range of different models that, by themselves, effectively capture some particular aspect of a complex phenomenon and that together, when properly weighted, are able to produce much more reliable forecasts for the macro-phenomenon of interest than any one model by itself (see also the discussion of the ViEWS project below). Tree-based approaches, often called decision trees, have been shown to be very useful for prediction tasks where the final outcome often relies on a range of interactions between variables. Random forest approaches, a particular tree-based approach to country-level forecasting, have been shown to improve predictive performance dramatically compared to general linear models (Colaresi and Mahmood 2017; Muchlinski et al. 2016). Tree-based approaches are less well suited for theory development, however, since it is often hard to pinpoint exactly which variable, or set of variables, is important for predicting the outcome.

Prediction is now used throughout the discipline of peace and conflict research. Greatly helped by the advances in computationally intensive methods to collect and analyse data, researchers increasingly follow Schrodt in using automated event-coded data from news wires to study, for instance, how public opinion affects the Israel-Palestine conflict (Brandt, Colaresi and Freeman 2008), or whether news data can be used to predict the outbreak of the First World War (Chadefaux 2014). The focus is not confined to armed conflict, but extends to predicting issues related to governance breakdown such as irregular leadership transfers (e.g., Beger, Dorff and Ward [2014]) and coups d'état (Bell 2018), as well as one-sided violence (e.g., Scharpf et al. [2014]), social movements (e.g., Chenoweth and Ulfelder [2017]), and many other forms of political violence (Ward et al. 2013) and their consequences (Hegre et al. 2017b). These studies have in common that they use data at a granular level (sometimes days or months instead of years) to predict conflict in the short term. Other studies rely on country-year data to produce long-range predictions. Hegre et al. (2013, 2016) forecast civil conflict many decades into the future, as do Witmer et al. (2017), and explore how different scenarios for UN Peacekeeping deployment would affect the incidence of armed conflict in the world (Hegre et al. 2019b).

2.4 Contemporary Efforts

Several ongoing conflict and political violence forecasting initiatives are currently active. At the country level these include the already mentioned PITF and the EU Global Conflict Risk Index (European Commission 2019). In the next one to four years, the EU Global Conflict Risk Index aims to provide risk assessment for violent conflict at the country level using quantitative and open source indicators. More specialised initiatives include the US Holocaust Museum's Early Warning Project that has been producing regular early warnings for mass atrocities and the One Earth Foundation which is producing coup d'état risk forecasts. Other projects focus on more granular data and are pitched at a more fine-grained geographic or temporal level. The Integrated Crisis Early Warning System (ICEWS) in particular has focused on a range of domestic and international crises graded by intensity (O'Brien 2010). Particularly valuable insights from ICEWS include separate modelling of conflict phases (onset, continuation and termination) as well as the utility of a multi-method approach to forecasting.

The most relevant ongoing project to EU-LISTCO is the Uppsala-based ViEWS – a violence early warning project. ViEWS is particularly relevant since it aims at sub-national prediction of several different types of armed conflict. The knowledge and lessons learned from ViEWS will directly contribute to EU-LISTCO's development of a prediction model. ViEWS will provide early warnings for three forms of political violence recorded by the UCDP – armed conflict involving states and rebel groups, armed conflict between non-state actors, violence against civilians – and for forced population displacement, and will apply these to specific actors, sub-national geographical units, and countries (Hegre et al. 2019a). ViEWS is by far the most ambitious early warning project currently in operation. The project aims to make substantial theoretical and methodological innovations. Theoretical developments are focused in particular on studying the mechanisms that lead to conflict or conflict escalation and using this knowledge to build theoretically informed forecasting models. Methodologically core innovations centre on the use of ensemble methods to leverage the strengths of particular models to build a more holistic system for forecasting conflict.

None of these existing efforts are explicitly tailored to tackle the issues of contested orders and areas of limited statehood from the EU-LISTCO project's conceptual framework (Börzel and Risse 2018). The forecasting methodology developed by EU-LISTCO will address these issues directly, requiring both theoretical and methodological innovation. Theoretically, the core tasks will be to develop a model that captures the concepts of contested orders and areas of limited statehood as effectively as possible in order to build models capable of forecasting governance breakdown as well as violent conflict. We also aim to create a closer link between quantitative forecasting and qualitative foresight methodology than has hitherto been established (see Nygård et al. 2019). To this end, we work in a Bayesian modelling framework that allows us to assess the extent to which it is possible to include qualitative foresight expertise directly in statistical modelling through the use of informed priors (Gill and Walker 2005). This sets EU-LISTCO apart from other ongoing efforts.

The current quantitative forecasting literature has only addressed the issue of tipping points to a very limited extent. Part of the reason for this is simply that what constitutes a tipping point, or indeed how to define one, remains unclear. Nonetheless, the idea of a tipping point in a social or political process, or variously a *critical juncture*, or a *structural change*, or simply a *turning point*, is found throughout political science. Some attempts to at least partially account for tipping points can, however, be found. Hegre at al. (2013), for instance, model the onset of armed conflict as a Markov process. Markov processes are very useful for studying processes that occur in distinct steps. As part of such processes, it is also possible to consider situations that become relatively stable once a particular step has been reached – i.e., a tipping point has been crossed. More recently, some literature has also begun to more explicitly model tipping points using 'change point' models that appear particularly useful for our purposes here. A change point model is a formal statistical model for finding a change, often called a break point. In a time series, this break point can then be interpreted as the tipping point. We plan to draw on recent work on change point analyses, using as our starting points models such as those developed by Blackwell (2018) or Cunen et al. (2018), to study the extent to which a useful model can be developed that would help us predict when a tipping point occurs in a process that begins with less organised and more non-violent protest but which ends in organised armed conflict. This, however, will remain in an experimental or pilot phase.

3. SCENARIOS AS QUALITATIVE RISK-SCANNING INSTRUMENTS

3.1 The Logic of Scenarios

"Today, the question of what scenarios are is unclear except with regard to one point – they have become increasingly popular" (Mietzner and Reger 2005: 220). It is difficult to define a term that has become, as Kosow and Gaßner put it, a "vogue" (2008: 44). Scenarios have not only become popular in societal discourse and the media as a tool for communication but are increasingly used in consulting and scientific practice. This has brought about a diverse and growing range of methodologies and understandings. Nevertheless, the following aims to provide a working definition for the purposes of this project (based on Gabriel [2013] and Neuhaus [2006]): Scenarios are descriptions of possible situations and chains of events with explicit reference to the future. They are the result of a conscious and deliberate group process of construction without any claim to be predictive. They must therefore always be thought of in the plural – meaning that there are, by definition, multiple scenarios for the topic in question.

Bishop (2007) highlights that scenarios must necessarily consist of both the situation in the future and the development leading up to that situation. A scenario for the year 2023 created in 2018 will therefore consist of a description of the situation in the year 2023 as well as a timeline starting in 2018 and ending in 2023. Scenarios are pictures and histories of the future.

Scenarios are based on a conception of the future as being complex, and highlight the epistemic status of the future as being inherently unknowable. They are thusly to be differentiated from prognoses, predictions or forecasts, which – given the necessary amount of resources and effort – are predictive in nature and do not necessarily need a history, meaning that the developments leading to the predicted situation are not provided. Prognoses based on probability, therefore, often appear in the singular, as their predictive claim does not require alternatives.

The concepts of possibility and probability are central to the validation of analytical proof, justification, critique, and falsification in science (Gabriel 2014). If this is taken as a starting point, how can scenarios that are by definition not probable and that do not claim to be predictive be logically justified? In this view, deductive reasoning is not an option, since it would go against a conception of the future as complex and inherently unknowable. Deductive reasoning would linearly extrapolate the future and create the illusion of knowledge – a process that scenario construction, especially in the context of risk scanning, must explicitly avoid. Inductive reasoning is a much more fruitful approach. So-called problems of induction (Popper 1963) are not applicable to scenarios, as they do not seek to establish truth, but rather to create an illustration of possibilities. Other scientific issues regarding inductive reasoning – such as the lack of possible empirical verification (Hume 1978, [1739]) – are also circumvented by the topic of inquiry being the future. Something that is not yet factual cannot be verified anyway, especially not through empiricism.

Yet, inductive postulation can be seen as an illustration of customs or habits. These postulations are to be judged not on the basis of their truth or validity, but on their usefulness:

> Hume argues that the fact that these inferences do follow the course of nature is a kind of 'pre-established harmony' […]. It is a kind of natural instinct, which may in fact be more effective in making us successful in the world, than if we relied on reason to make these inferences. (Henderson 2018: n.p.)

When constructing scenarios, it is more useful to generate hypotheses about the future that are meaningful – that are creating sense – than to produce the illusion of knowledge about an inherently unknowable future. Hypotheses about the future are always based on human experience but are not tied to it. To create plausible explanations in a group process means to combine past experiences of different people and thus to create new knowledge (Gabriel 2014).

This new knowledge – scenarios as pictures and histories of the future – can be criticised in three ways. Firstly, critics can and should discover and present background information that has not been included in the construction process and that renders the current iteration of the scenario implausible. Background information that has been included in the construction process but not been made explicit should at least be challenged since hidden premises might lead to hidden bias in scenarios. Diverse and therefore good scenarios are enriched by the assumptions of a diverse group, which should be explicitly stated. Secondly, critics can and should challenge the plausibility of scenarios. Since scenarios cannot be analysed empirically, this has to happen through critical discourse. That is why scenarios cannot be created alone but are necessarily the outcome of a group process. Thirdly, critics can and should generate hypotheses that cover an even wider spectrum of possibilities, thereby diversifying scenarios through the inclusion of different concepts and theories.

Hierarchies of knowledge sources are directly dependent on the conception of knowledge. Knowledge about the future – which necessarily constitutes an advance into the realm of the unpredictable – requires different hierarchies of knowledge sources than classical scientific enquiries directed primarily at empirical analysis. Because future risks are not yet here and cannot be found empirically, they must be created through reasonably combining experiences. Three kinds of sources of knowledge are therefore of special importance to the construction of scenarios (Gabriel 2013): (1) sources of experience, such as observations and experiments, (2) sources of reason, such as thought experiments, and (3) analogies that fall in the middle of the spectrum between sources of experience and sources of reason. Among these sources, the thought experiment takes centre stage, as it poses what-if questions. Analogies and metaphors enrich these experiments by adding the as-if. Experience (merely) constitutes the necessary conditions by providing the what-was, while necessarily operating in the background due to its reference to the past.

Special status in the realm of risk scanning can be granted to analogies, "one of the most interesting sources of knowledge, having a rich history" (Elkana 1981: 21), as well as to metaphors. Analogies and metaphors aim at comparison and highlight similarities in different ways. Analogies explicitly compare structures across different spheres and point to structural similarities. Metaphors compare implicitly and highlight similar features and relational qualities that do not necessarily aim at structural equality between different spheres. Taken literally, metaphors are simply false, although they may also point to basic differences in order to stimulate the audience to search for similarities (Duit 1991). Both analogies and metaphors can be especially useful in the field of qualitative risk scanning, as they seek to combine sources of experience and sources of reason in order to create something new.

Finally, and most importantly, thought experiments are never fully objective or completely intersubjective. Exclusively employing thought experiments can therefore never transform the unknowable into knowledge. They are, however, irreplaceable as tools for thinking about the future, combining via analogies the sources of experience and the sources of reason in order to make the possible imaginable and communicable (Gabriel 2013). It is this combination of sources of knowledge that can create actionability in the face of uncertainty. By combining thought experiments and analogies, experiences are rendered future compliant.

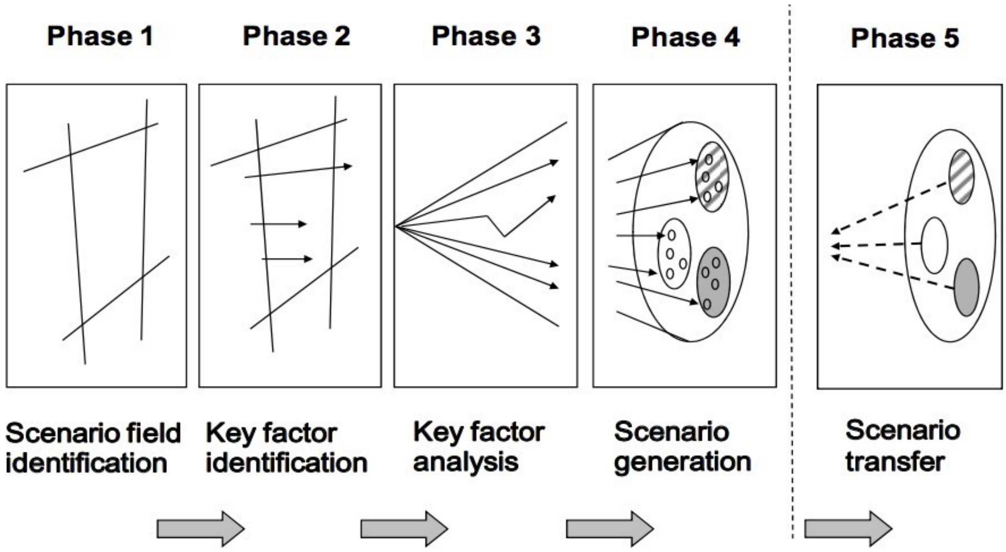
3.2 Scenario Techniques

There are a variety of techniques available to identify and assess factors that are influential in light of the scenario topic. For the purpose of identifying and assessing risks, EU-LISTCO conducts scenario workshops that simultaneously serve as a communication platform between researchers and policy experts. Multiple scenarios are created in these workshops using a combination of some of the techniques presented in the following overview.[2] Following Kosow and Gaßner (2008), the scenario process can be divided into the five following phases (see Figure 1): (1) scenario field identification, (2) key factor identification, (3) key factor assessment, (4) scenario generation, and (5) scenario transfer.

Other authors have opted for 3 phases (Mißler-Behr 1993), four phases (Burmeister et al. 2004; Dießl 2006; Phelps et al. 2001), or eight phases (Steinmüller 2002). Although these authors have opted for different levels of division when categorising the stages of a foresight project, the general content of these stages is rather similar. How these stages are to be realised, however, varies greatly, both in the foresight literature and in practice (Kosow and Gaßner 2008).

[2] The structure for this overview is proposed by Kosow and Gaßner (2008) and adjusted by the authors to include recent developments and techniques especially relevant in the context of EU-LISTCO.

Figure 1: Stages of scenario-based foresight projects



Source: Kosow and Gaßner (2008: 25)

3.2.1 Scenario Field Identification

The first step of every scenario process consists of defining the field. What is being examined? What is the scenario topic? How is the field delineated and – just as important – what is consciously being left out? What are the reasons for conducting a scenario process and what are the focal questions this process ultimately seeks to answer?

> At the beginning of the scenario process, comprehensive decisions regarding relevancy are to be made regarding the boundaries of the field which will be taken under study. For example, will a self-contained field of organization – such as a business enterprise, a clearly defined area of technology, or an organization […] be observed, meaning its internal factors alone? Or will mostly external factors, that is, the world immediately around it, be taken under study? Such 'surroundings' scenarios may well include the widest possible variety of dimensions: environmental, economic, political, technical, and cultural factors. Or will the internal arena and the surroundings, together with their interrelationships, be taken for study as a system, resulting quite deliberately in so-called 'system scenarios'? (Kosow and Gaßner 2008: 26)

It is at this point, be it implicitly or explicitly, that the type of scenario is being chosen. While each scenario process is different, and the combinations of focal questions and limitations (as well as delimitations) are endless, van Notten et al. (2003: 426) provide a useful typology of scenarios to use when considering scenario orientation (Figure 2).

Figure 2: Typology of Scenarios

Overarching themes		*Scenario*	*characteristics*
A	Project goal: exploration vs decision support	I.	Inclusion of norms? : descriptive vs normative
		II.	Vantage point: forecasting vs backcasting
		III.	Subject: issue-based, area-based, institution-based
		IV.	Time scale: long term vs short term
		V.	Spatial scale: global/supranational vs national/local
B	Process design: intuitive vs formal	VI.	Data: qualitative vs quantitative
		VII.	Method of data collection: participatory vs desk research
		VIII.	Resources: extensive vs limited
		IX.	Institutional conditions: open vs constrained
C	Scenario content: complex vs simple	X.	Temporal nature: claim vs snapshot
		XI.	Variables: heterogeneous vs homogenous
		XII.	Dynamics: peripheral vs trend
		XIII.	Level of deviation: alternative vs conventional
		XIV.	Level of integration: high vs low

Source: van Notten et al. (2003: 426)

3.2.2 Key Factor Identification

How key factors are identified varies in both theory and practice (Kosow and Gaßner 2008). While some authors propose extensive desk research to reach analytical and theoretical depth, others opt for a more participatory approach, focusing on intuitive and implicit knowledge, thereby furthering a broad picture, rather than a deep one. In the first approach, concrete decisions by the project team (the group organising the scenario project) are central, while in the second approach, key success factors are the composition of workshop participants and procedural guidance.

In the case of EU-LISTCO, a participatory approach will be used. This will both make effective use of participants' knowledge – which can be seen as both deeper and broader than that of the project team – and create ownership of the scenarios, making them more likely to be fruitfully used for policy recommendations and research at a later stage. In an online survey, participants will engage in what is known as horizon scanning. Horizon scanning is a process in which a broad range of political, economic, social, technological, environmental and other factors are identified. Participants are asked to identify those factors that they feel will influence the topic from the present to – in the case of EU-LISTCO – 2023. This is done in order to open up complexity and get a broad overview of the topic in question. The results of the survey are clustered, resulting in 35-45 *descriptors* of the defined scenario topic. This clustering process is undertaken by the project team in order to make sense of the survey results, to avoid double mentions, and to transform the results into a manageable list of descriptors for further analysis.

3.2.3 Key Factor Analysis

The analysis of key factors can be carried out in various ways, though "it always contains intuitive and creative aspects; these are essential for visualizing the various future developments on any key factor" (Kosow and Gaßner 2008: 27).

As a first step, key factors are analysed to determine their relevance for the scenario construction. Depending on the scenario type, this can be done through cross-impact balances (Weimer-Jehle 2006), trend impact analysis (Gordon 2003), sensitivity analysis (Saltelli 2004) and other quantified and qualitative methods. One of the more feasible methods that has proven its value in practice is uncertainty-impact analysis, especially since it can fruitfully be carried out online in advance of the actual workshop. In such an online survey, participants reduce complexity and focus on *key uncertainties*. Key uncertainties are produced by asking participants to rate the descriptors from the first survey in terms of uncertainty and impact. This assessment is an exercise in relativity. In two separate assessments, participants are asked to assess the whole list of descriptors relative to each other regarding first uncertainty and then impact. Combining and visualising these two assessments produces an *uncertainty-impact* diagram. Descriptors that rate highly on both uncertainty and impact can be seen as those factors with a significant potential for change. Developments that are both highly uncertain and highly impactful are useful for the construction of scenarios as they have the ability to change the future of the scenario topic in different directions. The results of the uncertainty-impact analysis are taken to the workshop and – depending on group size and workshop schedule – six to eight key uncertainties are selected in the plenary for further elaboration. In order to ensure common understanding and enable later communication about the topic, the selected key uncertainties are collectively defined. Participants develop a short definition as well as a shared view on the past development and current state of each key uncertainty.

In a second step of the key factor analysis, the chosen key factors are analysed regarding their potential states in the future:

> This brings us to the step which is especially typical of scenario techniques and sets them apart from other methods: the widening scenario 'funnel' in which individual key factors are subjected to analysis to find what possible future salient characteristics are conceivable in each case. An individual 'funnel opening into the future,' so to speak, widens out for each factor inasmuch as those salient characteristics are selected which are to become part of the budding scenario. (Kosow and Gaßner 2008: 27)

In practice, participants are divided into working groups and each group is assigned their key uncertainty. The groups are then asked to develop two-five *key uncertainty* *projections*. Key uncertainty projections are possible states the key uncertainty could be in, in the year 2023. Each group is asked to develop a set of projections that are mutually exclusive yet collectively exhaustive, meaning projections should not overlap, while at the same time covering the complete spectrum of conceivable possibilities in the given timeframe. The goal is to break down the complex question of what the future could look like in 2023 into smaller components, resulting in key uncertainties – that carry a high potential for change – and their corresponding possible states in the future.

3.2.4 Scenario Generation

In order to create so-called *raw scenarios,* consistent combinations of key uncertainty projections need to be bundled and selected. The *GBN Matrix* has become the standard in scenario generation techniques since its publication in 1991 by Peter Schwartz, founder of the foresight consultancy Global Business Network (GBN) (Schwartz 2012). However, since this technique only encompasses two factors with two projections each, it is not suited to deal with the complex surroundings of emerging violent conflict and governance breakdown. Other, much more elaborate methods include *Option Development and Option Evaluation,* distributed in the Eidos toolkit by the Parmenides Foundation, and the *MORPHOL* computer program, which performs complete morphological analyses and reduces the outcome based on user-defined exclusions (Godet and Roubelat 1996).

A method of scenario generation that allows for more complexity, while still being feasible in a short workshop setting is the (reduced) morphological analysis (Coyle 2003; Coyle et al. 1994; Duczynski 2000; Eriksson and Ritchey 2005; Ritchey 2009). In a general sense, a morphological analysis is a method for non-quantified modelling. It seeks to structure wicked problems that involve human behaviour and political choice, making them unsuitable for quantified or causal modelling. The two dimensions of the so-called morphological field are constructed by listing the key uncertainties on the y-axis and their corresponding projections along the x-axis. This produces a field of all *key uncertainty projections* relevant to the construction of scenario frameworks. A scenario framework can thus be constructed by vertically connecting *one* key uncertainty projection of each key uncertainty.

This connection of key uncertainty projections can be done in myriad ways. In the context of EU-LISTCO it will be a qualitative group process of not only connecting the projections – thus coming up with scenario frameworks – but also discursively adding necessary background conditions in order to make the connections between projections plausible and logically consistent. By adding background conditions at this point, it allows participants' background knowledge to enter the process, broadening the constructions of scenario frameworks by countering linear extrapolation.

3.2.5 Scenario Transfer

As argued above, scenarios must always consist of a description of the future situation as well as of a description of highly plausible developments leading up to that situation. In this context we call these descriptions *picture of the future* and *history of the future* respectively. There is some debate in the literature as to whether or not these descriptions should be seen as being part of the scenario transfer, or if they deserve a category of their own (Greeuw et al. 2000).

In order to create a picture of the future, raw scenarios (in the form of scenario frameworks) are taken as a basis. While there are highly formalised techniques to do such modelling – e.g., dynamic scenarios (Ward and Schriefer 2003) – more free-flowing techniques in a (reverse) mind mapping process have proven useful in workshop settings similar to EU-LISTCO. Participants are split into working groups of members. Each group chooses one of the developed scenario frameworks on which to elaborate. In the first step of this scenario development, each group is asked to develop a *picture of the future*. At this stage, participants take the chosen scenario framework and develop a coherent snapshot – a mental image of a point in time – of the situation in 2023. They do so by relating the key uncertainty projections of their framework to each other, discussing interrelations and adding background conditions. Since the development of these pictures of the future is heavily guided by the scenario frameworks, the different groups should have very different descriptions of what their situation in 2023 could look like. The goal is to develop snapshots that are neither obvious, nor absurd. The background conditions discussed in the plenary in the scenario construction – i.e., during the linking of key uncertainty projections – help to walk this line.

The second step in the scenario development aims at *histories of the future*, i.e., exemplary chains of events that illustrate plausible developments leading up to the respective pictures. These chains of events are constructed backwards – starting in 2023 and finishing in the present – in order to prevent linear extrapolation and to proactively include structural change. They describe coherent and connected histories while at the same time illustrating parallel and interlinked developments. Histories of the future serve a double purpose; one internal and one external. Internally, they are a means to validating plausibility (what must have happened for the situation in 2023 to have become [fictional] reality?). Externally, they serve as tools to better communicate constructed plausibility to group outsiders. The techniques here range from rather free-flowing approaches such as the 'horizon mission methodology' (Hojer and Mattsson 1999), via technologically supported approaches, such as the *Impact of Future Technologies* by the IBM Corporation (Strong 2007), to highly pre-structured approaches, like *Future Mapping* (Mason 2003), where participants are merely asked to arrange pre-defined events. Additional techniques of scenario transfer are summarised in Figure 3 by Kosow and Gaßner (2008: 79).

Figure 3: Possible transfer steps

Possible transfer steps are, for example:

- Interpretation and evaluation of scenarios according to probabilities (How probable is which development?)
- Trend analysis (research in greater depth on individual developments for the purpose of empirical grounding and validating subordinate aspects of the scenarios)
- Interpretation and evaluation of scenarios according to their desirability and/or positive and negative aspects (Do we want this or that?)
- Problem event analysis (What could happen if unexpected events enter the picture?)
- Impact analysis (What opportunities and risks are bound up with the situation described in the scenario?)
- Actor analysis (What meaning do these possible developments have for the individual persons who are actively involved and for the constellations of such actors?)
- Sectoral analysis (What meaning do the scenarios have for different areas of business activity?)
- Development of options for taking action / derivation of strategies (What can we do?)
- Evaluation of current strategies against the background of scenarios
- Roadmaps or backcasting (What do we want to achieve and with what steps?)
- Implementation of scenarios for the purpose of internal and external communication

Source: Kosow and Gaßner (2008: 79)

Wild cards deserve a special mention at this point, although they are technically not exclusively scenario transfer methods, since they can be incorporated during the scenario building process as well. Scenarios have to be highly consistent and plausible and thus often have to neglect improbable singular events. This tendency to err on the conservative side can be countered by introducing disruptive events to highlight uncertainties. Wild cards can be defined as:

- Discontinuous events, i.e., serious individual events,
- less probable events whose probability is difficult to estimate,
- but which have, when they enter the picture, a deep and far-reaching impact,
- are perceived as surprising, and
- alter the manner in which we think about the future and about the past; that is, they change our 'thought patterns', along with the interpretive templates with which we construct the world around us. (Kosow and Gaßner 2008: 80)

Steinmüller and Steinmüller (2003) have categorized an entire catalogue of potential wild cards. But wild cards can also be generated in a participatory manner, within the foresight process:

> Support for the identification of relevant disruptive events can be provided, for example, in the form of brainstorming sessions, surveys of experts, finding historical analogies, or even via an evaluation of science-fiction. This is, however, invariably difficult, and it is best to call upon the help of external competence as a means of reducing 'professional blindness'. (Kosow and Gaßner 2008: 81)

The challenge in the EU-LISTCO research will be to identify the combination of scenario transfer techniques that are best suited to provide useful foresight regarding the emergence of violent conflict and governance breakdown. Participants could for example be asked to present their scenario, including their *picture of the future* and *history of the future*. In a facilitated group discussion, the plenary identifies drivers, tipping points, and threats to the EU for each presented scenario. Guiding questions focus on the relevant drivers in the scenario, tipping points and points of no return, as well as potential immediate threats to the EU's security. The discussions are recorded and subsequently evaluated by the program team. The program team then also writes narrative versions of the scenario, paying special attention to the points raised in the discussion. These narratives and additional visualisations of each scenario are then played back to the participants for further elaboration and comments.

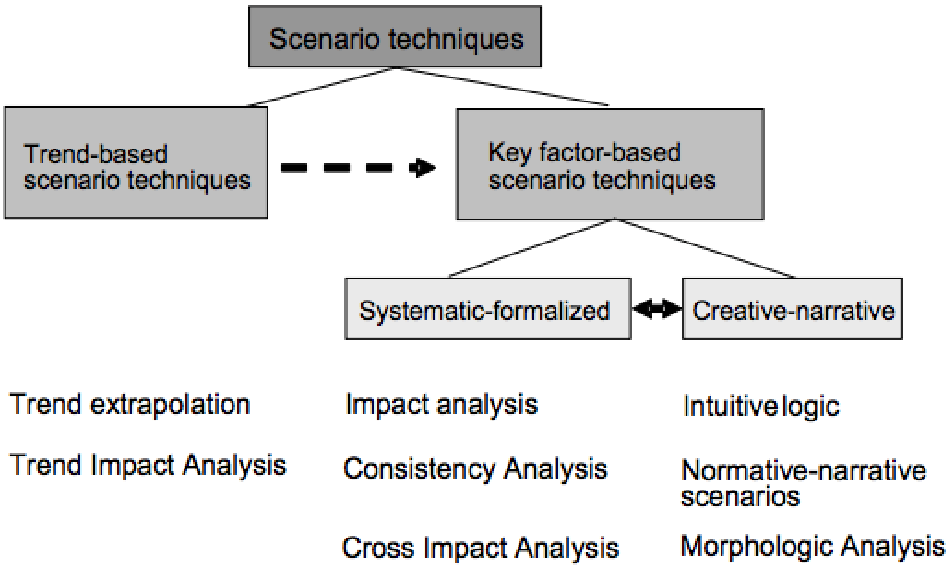
3.2.6 Ideal-Typical Scenarios

The literature identifies three ideal-typical scenario approaches, visualised in figure 4:

- Trend-based scenario techniques
- Systematic-formalised scenario techniques
- Creative-narrative scenario techniques

While the first of these techniques is solely based on trends, the second and third have in common that they are key factor-based approaches. However, in practice these boundaries are rather blurry. Quantitative trends regularly enter both kinds of key factor-based processes, and systematic-formalised approaches are rarely carried out without the help of creative-narrative techniques.

Figure 4: Ideal-type scenario approaches



Source: Kosow and Gaßner (2008: 78)

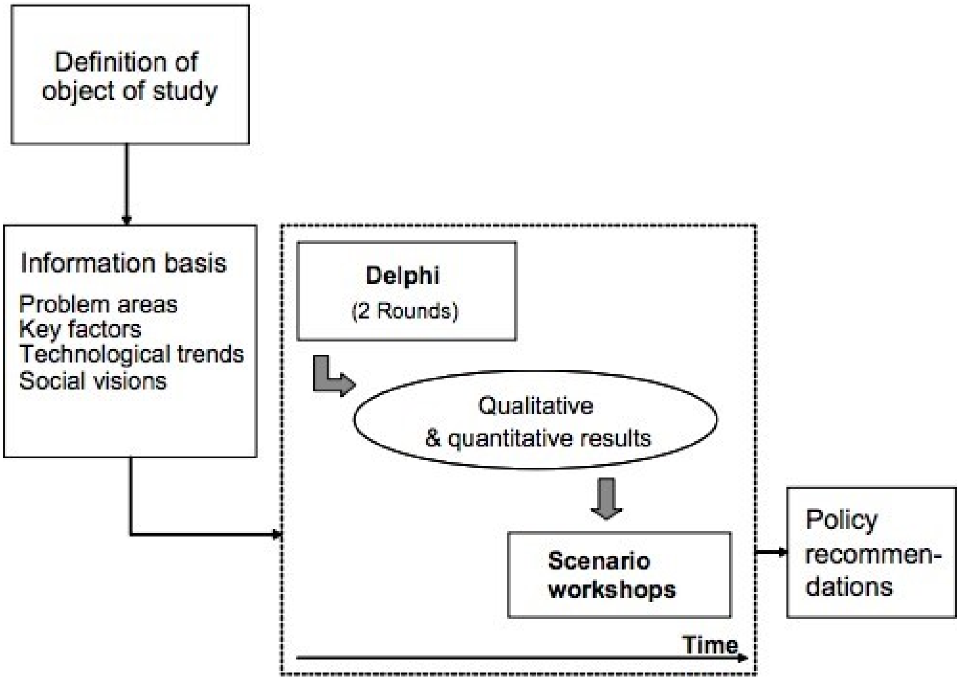
In the context of EU-LISTCO, trend-based scenarios can seemingly be disregarded, as the goal of the project is to find new risks rather than looking at how existing risks might develop. However, there might be room for adjustment, for example, by replacing the focus on trends with a focus on *weak signals* (Mendonça et al. 2012), *black swans* (Taleb 2007), or *black elephants* (Sardar and Sweeny 2016). One of the central questions within the qualitative foresight part of EU-LISTCO will be whether or not a foresight process tailored to address the emergence of violent conflict and governance breakdown fits into one of the ideal-typical scenario techniques or is deserving of a category of its own.

3.2.7 Scenarios and Delphi Techniques

The Delphi technique is a systematic survey of experts over several rounds (Häder 2002). This empirical approach to uncertainty was originally conceived to be carried out via overland mail, then was increasingly done via e-mail, and is today sometimes completely browser-based, e.g., in the case of Real Time Delphi, where the concept of several iterations through subsequent rounds has been abandoned. Instead, participants can access the platform at any time and adjust their answers, while always being provided with the current state of other participants' aggregated opinions (Gordon and Pease 2006).

The Delphi technique can be effectively combined with scenarios, as outlined in Figure 5. Finished scenarios can be fed into the Delphi study in order to foster the participants' imaginations. Conversely, the results of a Delphi study can be used in the process of scenario construction, especially during the first three stages of *scenario field identification*, *key factor identification*, and *key factor assessment*.

Figure 5: Scenarios and Delphi techniques



Source: Kosow and Gaßner (2008: 88)

Kosow and Gaßner (2008) identify two key success factors when combining Delphi with scenarios:

> In creating the scenario, the project team which was previously responsible for the Delphi survey was altered in part by the addition of new partners and the replacement of some by others. This addition of outside views proved to be very helpful as a means of keeping the process from 'getting stuck in the mud' of 'tried-and-true' perspectives.
>
> It is also to be recommended that different teams be assigned to work out scenario components for each individual topic area; this prevents them from consciously – or unconsciously – making a priori suggestions for specific constellations. Moreover, the evaluation of combinations of key factors as being consistent or inconsistent is central to the development of the scenario and should be carried out in the context of a workshop and as far as possible together with other stakeholders and experts than the ones who have worked out the key factors. (2008: 89)

In the context of EU-LISTCO, (Real Time) Delphi techniques could well be used to either delineate the scenario topic or to find (and simultaneously assess) key factors. The use of Delphi techniques would counter the limited time available in the workshops and – compared to simpler kinds of surveys – validate the starting points for the scenarios. The challenges lie in practical feasibility, since "Delphi surveys involve a great deal of effort, due especially to their time requirements and the involvement of a large number of experts" (Kosow and Gaßner 2008: 89).

4. INTEGRATING QUANTITATIVE AND QUALITATIVE METHODS

At an epistemological level, there are fundamental differences between quantitative conflict forecasting and qualitative inquiries into the future (Gabriel 2014; Lüdeke 2013). While the goal of forecasting as "scientific prediction" is to "have as many accurate forecasts as possible" (Grimm and Schneider 2011: 19), foresight – understood as a scientific enquiry into the future – assumes that "we cannot know the future" (Gabriel 2014: 4) and "extrapolation is bound to be wrong" (Gordon and Glenn 2004: 107). Debates around positivism, particularly regarding the difference between explanation and prediction (see also section 3.1), have contributed to the development of parallel research projects on the future of violent conflict that have largely been carried out in isolation. The field of future studies, however, is both theoretically and methodologically fragmented. This keeps it open to a large and growing toolbox of methods that combine advancements in both quantitative and qualitative methodological traditions (Gordon et al. 2005). Similarly, the quantitative forecasting literature increasingly emphasises the need for dynamic modelling and the potential for combining qualitative judgement and prediction. This provides a rich basis for developing a future research methodology to identify risks for governance breakdown and violent conflict that includes both quantitative and qualitative tools.

4.1 Quantitative Approaches in Foresight Processes

A variety of methods listed in future research toolboxes benefit from quantitative input. For example, looking at descriptive statistics about phenomena can already give useful indications of the present values' distributions. This can help set the stage for informed discussions among experts in a collaborative, scenario-based process. Similarly, statistical tools such as basic correlations or time series analyses that extrapolate data trends and developments can be used to inform participants about potential or expected developments based on data analysis (Lüdeke 2013).

Beyond statistics, there are examples of a combination of qualitative processes with more advanced mathematical models that include dynamic simulation of variables and explanatory pretensions. The main advantage of these is that computational models can perform rigorous logical deduction better than most human experts, answering purely mathematical what-if questions with large amounts of input data while even taking into account dynamic variable interaction (Lüdeke 2013). The application of regression analysis and dynamic modelling can also be used to produce quantitative or mixed-methods scenarios (Gordon and Glenn 2004). Advancements in the field of dynamic modelling for social sciences make it easier to marry qualitative and quantitative approaches, because they allow researchers to account for time-sensitive relationships between variables and produce output that is more appropriate for decision making under the assumption of fundamental uncertainty (Gordon et al. 2005).

Another well-established combination of quantitative and qualitative methods in future research is concerned with the identification and treatment of outliers. While quantitative models, depending on model specification, tend to regard outlier cases as largely irrelevant, many foresight methods explicitly search for extreme classes of phenomena that can be outliers, like black swans or elephants (Taleb 2007; Sardar and Sweeney 2016). Quantitative analyses can help identify those phenomena, while qualitative methods like scenario description and backcasting are more useful for contextualisation and constant re-interpretation of influential factors (Lüdeke 2013). In EU-LISTCO's scenario methodology, for example, simple statistical calculation is used to analyse Delphi survey results and identify risks that are rated as low likelihood, high impact by participants – potential critical but overlooked risks. Cross-impact analyses also use simple calculations to compare and classify risks and facilitate the selection process in a collaborative setting, before the construction of qualitative scenarios takes advantage of the detailed regional or sectoral knowledge of experts.

Case selection for qualitative elaboration can further be facilitated by using Boolean variables (QCA) (Ragin 1994) or systems analysis with ordinal variables (QDE) (Kuipers 1994). Both of these are examples of variable-oriented methods that work with data on weaker than ratio scales and allow a selection of cases through specification of certain scope conditions to different extents, also involving qualitative information at the moment of input specification (see Lüdeke 2013). As Lüdeke points out, QDE is an appropriate method to fulfil model specification transparency, but the results can be ambiguous. Examples of triangulation with these methods have combined QDE in the initial stage of deductive reasoning in foresight processes with a subsequent qualitative part to maximise transparency and mutual understanding of assumptions and reasoning between systems, analytical models, and qualitative experts – e.g., in climate research (e.g., Luna-Reyes and Andersen [2003]; Lüdeke [2013]).

4.2 Prediction and Judgement: Converging Approaches

Chadefaux (2017) argues that despite average poor predictive value, human judgement can be used to inform and improve the predictions of algorithms or *superforecasters.* The latter are people with above average abilities to predict political and geopolitical events, identified in forecasting tournaments by Tetlock and colleagues (Tetlock 2005; Tetlock and Gardner 2016). Grimm and Schneider (2011) argue that the prediction of political stability in particular can benefit from a combination of structural, dynamic and game-theoretic approaches. According to Chadefaux (2017), the combination of expert forecasting tournaments with game-theoretic simulations, prediction markets, and advanced quantitative simulations is among the most promising avenues for improving conflict prediction.

One example of the integration of expert judgement on the side of quantitative social science research is the use of priors based on expert assessment in Bayesian frameworks (Gill and Walker 2005; Montgomery et al. 2012; Morris 1977). This approach allows the systematic introduction of qualitative area expertise as information into quantitative models (Gill and Walker 2005). Tree-based Bayesian frameworks such as random forest algorithms have multiple advantages for cases in which prediction instead of explanation is the explicit goal of research and they perform better than logistic regression for class-imbalanced data on phenomena like civil war onset (Muchlinski et al. 2016). Working in a Bayesian modelling framework to combine qualitative expertise and quantitative forecasting techniques will be one of EU-LISTCO's innovations linking the two approaches.

A challenge in integrating quantitative and qualitative methods in future studies is reconciling the assumptions of both fields. Acknowledging the over-reliance on extrapolation of historical data, the emphasis lies in allowing the consideration of fundamental uncertainty by dynamically simulating a variety of potential trajectories that take into account possible changes in the system underlying the simulation. Pacinelli (2008) lists several future studies methods that attempt to combine judgement and statistics to account for different perceptions about change. These considerations show that suggested improvements in foresight and future studies converge with current developments in quantitative conflict research regarding dynamic analysis and the potential for including expert judgement.

4.3 Implications for Policy- And Decision-Making

In cases of quantitative input into a qualitative, expert-based foresight process, transparent modelling and a careful interpretation of quantitative results in light of the operationalisation of key variables is crucial. As Pacinelli (2008) emphasises, the reliance of quantitative forecasting on the extrapolation of historical data is problematic if assumptions are not explicitly stated. If the sources of quantitative results are not communicated to participants in an understandable way, these parts of the analysis effectively function like a black box, which can lead to misunderstandings or misinterpretations. The disciplinary and methodological background of experts involved in the foresight processes must thus be taken into account before deciding to include quantitative reasoning about the future. If quantitative and qualitative parts of the analysis are to build on and inform each other, researchers need to consider the added value of mathematical reasoning versus the potentially incorrect conclusions drawn by experts who are not familiar with such tools. In the case of a scenario process with regional and policy experts, for example, transparency about mathematical models alone cannot ensure an appropriate reflection of differences in explanatory value regarding the statistical, simulated and quantitative arguments involved (see Lüdeke [2013]).

One case in point here is the definition and operationalisation of variables into observable indicators for statistical analyses. These analyses start after decisions about definition and operationalisation are made. In contrast to rich, qualitative description, this is a process that abstracts the phenomenon at hand from its context. Interrelations of variables are kept constant and there is no consideration of dynamic, time-sensitive interrelations (Lüdeke 2013). Such an approach to modelling is still present in quantitative conflict and governance research, being only recently complemented with dynamic models (Muchlinski et al. 2016). The understanding of input, logic, and interpretability of results in such analyses need to be taken into account and clearly communicated to experts involved in the foresight process to enable them to reflect on the explanatory value of extrapolation and qualitative description for complex social phenomena.

Robust Decision Making (RDM) may facilitate decision-making processes with quantitative methods and takes seriously the risk that policy makers tend to either over-estimate the value of predictions or discount quantitative results as lacking reliability (Groves and Lempert 2007; Lempert et al. 2013). In this method, a potential future policy decision is taken as a basis for the backward running of multiple models with different sets of assumptions to simulate the implications of the decision across a range of possible futures. This is an example of an "ex-ante simulation of policy choices" effects' called for by Grimm and Schneider, speaking to their criticism that the "increasing number of sophisticated forecasts" do not take into account that "the real usefulness of forecasting is the evaluation of how various political instruments are able to address the challenge of social tipping points" (2011:13). RDM identifies the futures most relevant to the plan's success, which helps understand the scope conditions for the potential future performance of a policy decision. It combines features of both scenarios and probabilistic risk assessment, without relying on simple predictions. RDM is designed according to users' needs and should help facilitate the interaction of policymakers and experts with a computational tool that can handle large amounts of data and model specification (Lempert et al. 2013). It represents an application of quantitative methods that, instead of simplifying reality, takes into account the potential outcomes of a variety of future developments with the aim of making plans that can succeed under conditions of uncertainty and a range of possible futures (Lempert et al. 2013). Other examples of applications of quantitative methods in decision-making analysis worth considering include utility matrices, cost-benefit-analyses, or payoff matrices that are combined with qualitative elements (see Gordon and Glenn 2004).

5. CONCLUSION: COMBINING FORECASTING AND FORESIGHT FOR STRATEGIC POLICY PLANNING

Quantitative methods for forecasting violent conflict and political violence are available and have improved during the last decades, while governance breakdown as a dependent variable, as well as limited statehood and contested orders as predictors have, to date, not been included. For short-term time horizons (days, weeks or months into the future) in particular, extrapolating the development of key variables based on past trends has proven useful in predicting the probability of violence on the national and sub-national level. EU-LISTCO plans to target existing efforts toward the project's specific phenomena of interest, including governance breakdown and accounting for both areas of limited statehood and governance breakdown to help anticipate threats. Examples of phenomena that quantitative forecasting cannot take into account are diffuse risks like disruptive technological advancements or long-term developments of societal resilience – both of which are of interest to EU-LISTCO. Due to its epistemological foundations and methodological constraints, the quantitative approach tends to underestimate fundamental change in favour of gradual, linear developments. This is also the reason such analyses cannot account for human agency – e.g., with regard to political decisions or other events related to spontaneous action. These phenomena are often identified as critical junctures that changed the course of history in ex-post qualitative process-tracing analyses (Collier 2011).

This is where scenario-based foresight comes in, as it explicitly focuses on the possibility and uncertainty of fundamental change. Starting from the premise that the future cannot be known, this approach emphasizes analysis of current expectations about possible futures and their implications for policy design for a time horizon of up to decades (see Gabriel [2014]). In order to do so, there is a large set of tools to choose from. However, the field is not yet well organised, and a consolidated state of the art is lacking. This is especially true when it comes to scenario-based foresight approaches in relation to risk. Nevertheless, there are combinations of techniques that promise fruitful results once put into practice. The EU-LISTCO project provides the chance to develop scenario-based foresight approaches tailored specifically to risks and threats, including methods that facilitate reverse process-tracing to address the possibility of spontaneous human agency and non-structural change.

A comparative view of quantitative and qualitative methods shows two things. First, while existing quantitative and scenario-based approaches differ in their theoretical foundations, both of these toolkits or methodological traditions have their respective limitations which the other can help overcome. At the borders of both disciplines, there are considerable overlaps that point toward the possibility of fruitful interaction. While both the quantitative and qualitative parts of the projects will contribute individually to the project's aim of understanding tipping points, EU-LISTCO is an opportunity to bring together two approaches whose developments already seem to be converging, especially when it comes to the combination of human judgement with dynamic models and decision-making algorithms.

Second, the challenge of anticipating security risks for strategic policy design is a case which is particularly well-suited to experimenting with methodological combinations. While it is important to be able to anticipate the escalation of violent conflict in the near future as precisely as possible, and existing quantitative research on violent conflict enables this to a certain degree, the onset and escalation of conflict and processes of governance breakdown are impacted by a range of factors that do not follow gradual structural change. EU-LISTCO's efforts at anticipating governance breakdown and violent conflict aim at identifying how quantitative input can enrich qualitative foresight processes and how the results of these processes can in turn help shape quantitative research.

One concrete opportunity for this is the identification of possible tipping points. Quantitative research provides experts with information on *what* the predictors or influential factors for violent conflict and governance breakdown are. Experts are then asked to *imagine* exactly *how* these influential factors might tip over and become actual threats. The latter is also an entry point for discussing the possibility of policy responses to transform risks into opportunities for building resilience, an element discussed in EU-LISTCO's policy planning workshops. In addition, tipping points identified in the scenarios can provide new influential factors for quantitative researchers to study and see if the correlation developed in thought experiments is quantitatively verifiable. Of course, we hope that both the innovations that the project will contribute to sub-national forecasting of governance breakdown and violent conflict and the identification, assessment, and elaboration of tipping points through scenario-based foresight can be translated to other research and policy fields that are confronted with an uncertain future and both structural change and complex systems.

In the design of the project and the objectives of a study on anticipating governance breakdown and violent conflict objectives, particular consideration is given to the applicability of these methods to study the future in (foreign) policy planning processes. The combination of quantitative and qualitative future studies methods developed for EU-LISTCO already mirrors existing efforts to improve policy planning and crisis management in bureaucratic institutions, where there seems to be an increasing willingness to use a variety of tools. Experimenting with an interaction of qualitative expert assessments and quantitative elements in risk scanning and policy design workshops will also be an opportunity to study the challenges of translating arguments between the research and policy communities. The participation of both researchers and policy planners in the structured group communication processes for both threat scanning and policy planning is a crucial element to test the methodology's practicability and relevance for the EU's foreign policy challenges and the early warning and early action capabilities of relevant institutions.

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