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An integrated framework for anticipating the future and dealing with uncertainty in policymaking

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ABSTRACT

Policymakers need to make policies for an uncertain future, and policy analysts assist policymakers in choosing preferred courses of action. Despite a longstanding recognition that the futures field can contribute a great deal to policy analysis, futures work is not used to its full potential as an element of policy analysis. This is partly due to an absence of well-defined links between the fields and a common unambiguous typology. This paper proposes a framework for linking policy analysis, policymaking, and the futures field so that they can benefit mutually from a shared approach and tools. This integrated framework is intended to guide policy analysts on the appropriate use of futures approaches so that they can improve their analyses and contribute to better policies. At the same time, futures practitioners will be encouraged to align their approaches with the needs of policy analysts, thereby leading to increased uptake of futures work in policy analysis.

1. Introduction

Policymakers need to make policies for an uncertain future, and policy analysts assist policymakers in choosing preferred courses of action by clarifying the problem at hand, identifying alternative solutions, and displaying trade-offs among their consequences (Walker, 2000). Policy analysts draw on a vast amount of well-established literature that is exhaustively discussed in the policy analysis field and provides extensive guidance as to the appropriate methods to be used for dealing with uncertainty (See, for example, Clemen, 1996; De Neufville, 2003; Dewar, 2002; Lempert, Popper, & Bankes, 2003, 2013; Morgan & Henrion, 1990; van der Heijden, 1996; Walker, Marchau, & Kwakkel, 2013; Walker, Lempert, & Kwakkel, 2013; and Walker, Haasnoot, & Kwakkel, 2013). The focus is mainly on dealing with uncertainties in a correct manner, and to a lesser extent on better anticipating future developments in support of policymaking. The strong ties between the fields of policymaking (PM) and policy analysis (PA) are illustrated by the left arrow in Fig. 1.

As explained in van Dorsser, Walker, Taneja, & Marchau (2018), the link between PA and PM is much stronger than the moderate link between the futures field (FF) and PM, and the weak link between PA and the FF (see Fig. 1). This is despite a longstanding recognition that insights from the FF can contribute a great deal to PA and PM (Dror, 1970; Rijkens-Klomp, 2012; van der Duin, van Oirschot, Kotey, & Vreeling, 2009; van der Steen & van Twist, 2012). In practice, futures work is used infrequently in direct support of PM, and is not used to its full potential as an element of PA. The ‘weak’ link between the FF and PA is clearly expressed by van der

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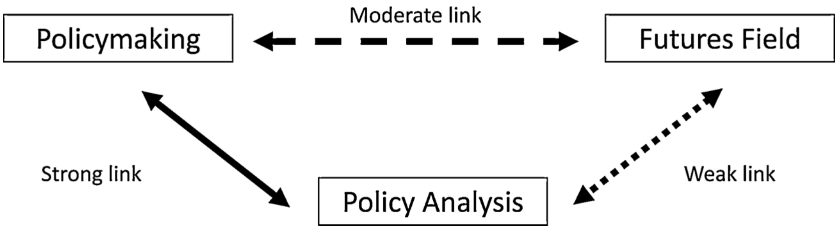


Fig. 1. Links between Policymaking, Policy Analysis, and the Futures Field.
Source: van Dorsser, Walker et al., 2018

Steen and & Twist (2013, p.33), who conclude, based on a wide array of research, that there exists a persistent gap between 'knowing' the future and acting toward it in policymaking. They addressed this as follows: *"[I]n spite of growing demand for anticipatory knowledge, the practice of linking foresight to policy still appears problematic. … While there is abundance of study on the future, the use of anticipatory knowledge in policy remains negligible at best"*. The existence of this gap is unfortunate, since policies often can benefit from taking into account the uncertain future developments that can be provided by the various disciplines of the FF.

As far as strengthening the link between the FF and PA is concerned, the problem does not seem to be a lack of interest in future developments on the part of policymakers, but rather a mismatch between anticipatory knowledge from the FF and the uptake of this knowledge by PA. A partial explanation for the weakness of the link is the confusing terminology applied in the FF, in which, the disciplines have many different names, such as: *futurology*, *futures studies*, *futures research*, *foresight*, *forecasting*, *Bayesian forecasting*, *technology forecasting*, and *technological forecasting,* as applied in the English-speaking world, and *prospective* and *prospectiva*, as more frequently used in a French or Latin context. The line of reasoning that we follow in this paper (see Fig. 1) is:

- PM should make better use of insights from the FF;
- However, the direct link between PM and the FF is only moderate, while the link between PM and PA is strong;
- So, the challenge is to improve the link between PA and the FF (in order to provide a stronger link between the FF and PM).

Following some earlier attempts to partly overcome the barriers of linking PA to the FF (DaCosta, Warnke, Cagnin, & Scapolo, 2008; Riedy, 2009; van Asselt, Faas, van der Molen, & Veenman, 2010), the authors recently proposed a way to improve the link between both fields (van Dorsser, Walker et al., 2018). To this end, we used the uncertainty typology applied in PA to structure the forward-looking disciplines (and subfields) of the FF, according to the level of uncertainty of the type of futures that they aim to address. This was done by first establishing a link between the four levels of uncertainty as defined in Walker, Marchau, & Swanson (2010) and the four types of futures that they address (i.e. projected, probable, plausible, and possible) according to the definition of Voros (2003). We subsequently linked the four types of futures to four distinct disciplines in the FF. This required clearing up some of the ambiguity and confusion among the terms used in the FF, by dividing the field into four distinct disciplines, namely: futures (research or studies); (strategic) foresight; probabilistic forecasting (or Bayesian forecasting); and (deterministic) forecasting. This resulted in the creation of an indirect link that reinforces the moderate link between the FF and PM through the creation of an explicit link between the FF and PA. This new link enables the creation of an integrated framework for anticipating future developments and dealing with uncertainty in policymaking. In this framework, the methods from the FF are specifically linked and can be tailored to suit the needs of the policy analyst in the face of various levels of uncertainty, and new anticipatory tools can be jointly developed to deal with uncertainty in PA. In combination with the existing approaches shared by the PA and PM fields, the result is an overall framework that integrates the strengths of all three fields (PM, PA, and FF).

The objective of this paper is to propose a framework for the integration of PA and FF. This integrated framework is considered the next step in linking PM, PA, and FF through a shared approach and toolbox for anticipating uncertain future developments given various levels of uncertainty (see Fig. 2).

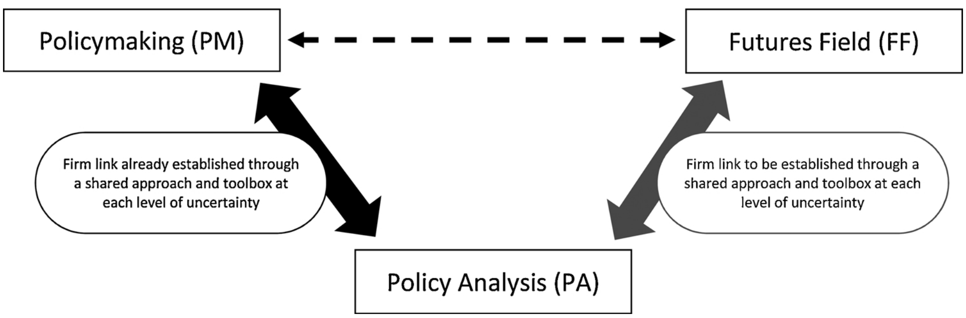


Fig. 2. Illustrating the research gap addressed in the paper: Establishing firm links between policymaking, policy analysis, and the futures field.

The firm link to be established, with its shared approach and toolbox, serves both PA and FF. Given the level of uncertainty associated with the policy issue at hand, the overall framework will not only guide policy analysts in selecting the appropriate approach for dealing with future uncertainty (already common practice), but also in identifying the corresponding Futures discipline, from which appropriate insights and approaches for advancing projections on future developments can be used. Conversely, researchers in the FF can better understand the needs of the policy analyst at a given level of uncertainty for the policy issue at hand, and tailor their approaches (or tools) to the needs of the policy analyst. The creation of an integrated framework is thus aimed towards supporting the creation of better policies.

First, a few words to avoid confusion on terminology. The term ‘approach’ is used in this article to express the shared way of approaching a policy problem, based on an integrated theoretical framework wherein the level of future uncertainty is the starting point. For implementing this approach, a shared set of tools is required for dealing with each level of perceived uncertainty. These tools become part of a shared toolbox used by the PA and FF, comparable with the shared toolbox already in place for the PA and PM fields.

This paper proceeds as follows. Section 2 familiarizes the reader with the well-established link between PA and PM and the usual approaches for PA in support of PM, which depend on the encountered level of uncertainty as defined in Walker et al. (2010). Section 3 discusses the disciplines and corresponding projection methods in the FF and the proposed link to PA based on the same four levels of uncertainty. Section 4 presents the integrated approach and toolbox for anticipating future developments and dealing with future uncertainty. Conclusions and recommendations for further research follow in Section 5.

2. Policy analysis approaches in support of policymaking

PA involves the design of policies to influence the behaviour of the system to achieve the goals of the policymaker. For assessing the impact of the proposed policies on the system, policy analysts usually apply the framework presented in Walker et al. (2010) and van Dorsser, Walker et al. (2018). This framework classifies policy issues according to their location and level of uncertainty (see Table 1).

The location of uncertainty addresses where the various aspects of the policy domain are located and whether they are inside or outside the control of the policymaker. The locations include the proposed policies themselves, the external forces that act on the policy domain, the internal relationships and functioning of the system on which the proposed policies and external factors are acting, the relevant outcomes of interest that are affected by the proposed policies and external factors, and the weights that are given to these outcomes of interest by the various stakeholders.

The level of uncertainty includes two extreme levels (determinism and total ignorance) and four intermediate levels. Determinism is the situation in which we know everything precisely. It is not attainable, but it acts as a limiting case at one end of the spectrum. Level 1 uncertainty is any uncertainty that can be described adequately by means of a point estimate and its sensitivity. Level 2 uncertainty represents the situation in which it is assumed that the system model or its inputs can be described probabilistically, or that there are a few alternative futures to which probabilities can be assigned. Level 3 uncertainty represents the situation in which one is able to enumerate multiple plausible alternatives without being able to judge how probable they are (only the ranges in which the future will unfold are assumed to be known). Level 4 uncertainty involves the deepest level of recognized uncertainty. In this case, we know only that we do not know. Total ignorance is the other extreme on the scale of uncertainty. As with determinism, total ignorance acts as a limiting case.

Different policy approaches are applied to deal with different levels of uncertainty. Agusdinata (2008) distinguishes between static and dynamic approaches. The static approaches that he addresses use an ‘optimal’ policy approach, in which the future is ‘predicted’ and an ‘optimal’ policy for that future is chosen; or a static robust policy approach, in which a range of plausible futures are identified, and a policy is chosen that works acceptably well across most of them. The dynamic policy approach produces policies that are adapted over time as conditions change and learning takes place. It aligns with the adaptive policymaking approach of Walker, Rahman, & Cave (2001). These approaches can, with some modification, be linked to the four levels of uncertainty defined in Table 1. The first modification concerns the use of the term ‘forecasting’ instead of the term ‘prediction’ to describe the method for anticipating expected future developments, as predictions are ‘guesses’ associated with fatalism, fortune-telling, and superstition (Silver, 2012), whereas forecasting provides a scientific approach for dealing with Level 1 uncertainty (van Dorsser, Walker et al., 2018). The second modification is introducing an additional column in Table 2 to include the risk-based policy approach, as suggested by van Dorsser (2015). The adapted result is a guiding structure that reflects the commonly applied approaches to policymaking (or decisionmaking) at a given level of uncertainty. It provides the first building block for our integrated framework, by indicating that the following approaches are usually considered appropriate for each of the levels:

- Level 1 uncertainty: ‘Optimal’ policy approach;
- Level 2 uncertainty: Risk-based policy approach;
- Level 3 uncertainty: Static robust policy approach;
- Level 4 uncertainty: Adaptive policy approach.

Table 2 summarizes the types of policies corresponding to the four levels of uncertainty that are shared between the fields of PA and PM.

Table 1
Progressive transition of levels of uncertainty.
Source: Adapted from Walker et al. (2010) and Walker (2011)

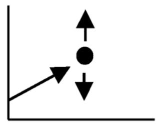
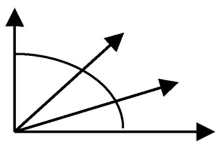
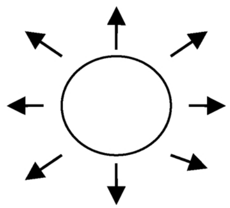
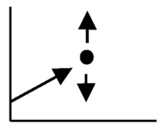
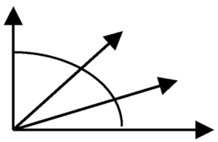
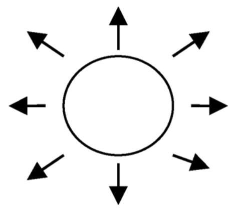
			LEVEL				
			Level 1	**Level 2**	**Level 3**	**Level 4**	
LOCATION	**Context**	**Complete determinism**	A clear enough future 	Alternate futures (with probabilities) 	A limited, bounded set of plausible futures 	An unlimited, unbounded set of possible futures 	**Total ignorance**
	System model		A single (deterministic) system model	A single (stochastic) system model	Several system models, with different structures	Unknown system model; know we don't know	
	System outcomes		A point estimate for each outcome	A confidence interval for each outcome	A known range of outcomes	Unknown outcomes; know we don't know	
	Weights on outcomes		A single set of weights	Several sets of weights, with a probability attached to each set	A known range of weights	Unknown weights; know we don't know	

Table 2
Policy approaches in relation to uncertainty.
Source: Adapted from Agusdinata (2008) and Walker, Marchau, & Swanson (2010)

Type	**Static policy**			**Dynamic policy**
Uncertainty	**Level 1**	**Level 2**	**Level 3**	**Level 4**
Context	A clear enough future 	Alternate futures (with probabilities) 	A limited, bounded set of plausible futures 	An unlimited, unbounded set of possible futures 
Type of policy	'Optimal' policy Forecast the future and choose an 'optimal' policy for that future	Risk-based policy Use probabilities to optimize policy in accordance with the risk attitude of the policymaker	Static robust policy Identify plausible futures and find a policy that works acceptably across most of them	Adaptive policy Adapt the policy over time as conditions change and learning takes place

3. Linking the policy analysis and futures fields

The guiding structure for linking PA and the FF builds on a recent publication of the authors that outlines our views on how to establish an explicit link between the various forward looking disciplines and the levels of uncertainty regarding the issues that they address (van Dorsser, Walker et al., 2018). The linking pin is Voros' (2003) taxonomy, which starts by considering all potential futures and gradually zooms into the more likely and/or desired ones. His future types are defined as follows:

- Potential – everything beyond the present moment is a potential future. This comes from the assumption that the future is undetermined and 'open', not inevitable or 'fixed' (which is perhaps the foundational axiom of futures studies).
- Possible – those futures that we think 'can' happen, based on some future knowledge we do not yet possess, but which we might possess someday (e.g., warp drive).
- Plausible – those futures that we think 'could' happen based on our current understanding of how the world works (physical laws, social processes, etc.).
- Probable – those futures that we think are 'likely to' happen, based on current trends.
- Projected – the (singular) default, business as usual, 'baseline', extrapolated 'continuation of the past through the present' future, that could also be considered as being 'the most probable' (or most expected) of the probable futures.
- Preferable – those futures that we think 'should' or 'ought to' happen. These are based on normative values and can fall into any one of the above future types.

van Dorsser, Walker et al. (2018) conclude that the terminology applied in the framework presented in Table 1 and the terminology applied in Voros' taxonomy is similar, so a direct link could be established between the four levels of uncertainty and the four types of futures. The next step was to link the forward looking disciplines of the broader FF (i.e., forecasting, probabilistic forecasting, foresight, and futures) to the four types of futures that they concern. This resulted in a conceptual model that was called the Futures Pyramid (see Fig. 3). The model conforms (as much as possible) to existing terminology in the 'futures' and 'policy analysis' fields, while eliminating overlap among the forward-looking disciplines.

In the Futures Pyramid, the higher the place in the hierarchy, the higher is the level of associated uncertainty. At the bottom of the pyramid are the areas for which relatively more certain insights into the future can be obtained, with a reasonably high level of detail. When moving up the pyramid, what is 'known' becomes smaller and the insights into the future become less certain and less detailed, which is reflected in the narrowing of the pyramid towards the top. The most uncertain and unpredictable views of the future belong at the top of the pyramid.

The model recognizes four layers, where each layer represents certain approaches in the broader field of anticipating uncertain future developments. These four layers are linked to the four levels of uncertainty about the future. The four layers, approaches that they represent, types of futures, and level of uncertainty are structured as follows:

- Layer 1: *Deterministic Forecasting* links to projected futures and Level 1 uncertainty;
- Layer 2: *Probabilistic Forecasting* links to probable futures and Level 2 uncertainty;
- Layer 3: *Foresight* links to plausible futures and Level 3 uncertainty;
- Layer 4: *Futures* links to possible futures and Level 4 uncertainty.

The anticipatory disciplines associated with the four layers were described as follows:

Deterministic Forecasting aims to provide a single reliable forecast of the future state of the system based on trend extrapolation and expert judgment. Deterministic forecasts are intended to provide, with a high level of certainty, a single most probable estimate of detailed attributes of the system under consideration for a relatively short time period ahead (e.g., by forecasting the expected output

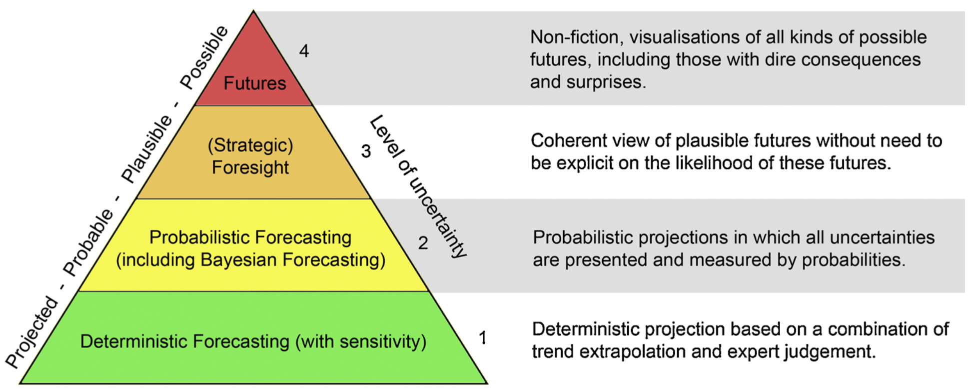


Fig. 3. Futures Pyramid.
Source: van Dorsser, Walker et al. (2018)

in the next few periods: the next few days, weeks, or years, depending on the time scale in which the historical data are gathered). Deterministic forecasts are often accompanied by a sensitivity analysis that indicates their sensitivity to changes in the most relevant drivers.

Probabilistic Forecasting aims to provide a clear view of the possible outcomes of a system for which the variation in the main parameters is expected to be known with reasonable certainty. The art of Probabilistic Forecasting is fully explored in Bayesian Forecasting, which is founded on the premise that all uncertainties should be presented and measured by probabilities (West & Harrison, 1999). Probabilistic projections can be applied to both short- and long-term issues, though projections for longer term issues can be obtained only at a higher level of aggregation, since the farther out the time horizon, the less detail that can be taken into account if one aims to remain within a reasonable bandwidth (van Dorsser, Wolters, & van Wee, 2012).

Foresight aims to develop a coherent forward view of plausible futures without the need to be explicit on the probabilities with which these futures occur, since at this level of uncertainty it is no longer possible to assign probabilities. The word 'coherent' refers to the fact that the forward view is intended to cover the full expected range of plausible futures that lay within the realm of normal expectations, not including the more extreme ones that are addressed by the Futures discipline.

Futures (studies or research) aims to provide a systematic view of possible futures (including 'known unknowns' and 'wildcard' surprises). The methods for dealing with the 'known unknowns' and 'wildcard' surprises are associated with Level 4 uncertainty, which is often referred to as 'deep uncertainty' (Walker, Lempert et al., 2013).

4. An integrated framework for anticipating the future and dealing with uncertainty

Based on the well-established linkages between the levels of uncertainty and the various approaches for dealing with uncertainty in PA discussed in Section 2, and the recently published linkage between the levels of uncertainty and the various forward looking disciplines in the FF discussed in Section 3, we have arrived at an integrated framework, which is presented in Table 3. In particular, Table 3 presents the approaches for anticipating the future and dealing with uncertainty in policymaking. Corresponding to each level of uncertainty, Column 2 displays the policy analyst's approaches to supporting policymaking, and Column 3 displays approaches from the FF that can be shared with the policy analysts. As stated earlier, the approaches shared with PM are well-established and extensively discussed in the PA literature, while the approaches shared with the FF are linked through the Futures Pyramid. Though the latter can be found in the FF literature, the uptake of these approaches may benefit from a shared approach, and some approaches are perhaps lacking or need to be improved.

Table 3
Integrated framework for anticipating future developments and dealing with uncertainty in policymaking.

Level of uncertainty	Shared typology (PA and PM) for dealing with uncertainty in decisionmaking/policymaking	Shared typology (PA and FF) for improving insight into future developments and dealing with future uncertainty
Level 1: Clear enough future.	Optimal policy: Forecast the expected future and choose an 'optimal' policy for that future.	Forecasting: Single reliable forecast based on trend extrapolation and expert judgement, in combination with a sensitivity analysis.
Level 2: Alternative futures (with probabilities).	Risk-based policy: Use probabilities to optimize policy in accordance with the risk attitude of the policymaker.	Probabilistic forecast: Probabilistic forecasts, for which the likelihood of all relevant parameters can be expressed in terms of probabilities.
Level 3: A limited, bounded set of plausible futures.	Static robust policy: Identify plausible futures and find a policy that works acceptably across most of them.	Foresight: Limited range of scenarios that is intended to explore the envelope of plausible future developments, based on an ever increasing understanding of the system and its key uncertainties.
Level 4: An unlimited, unbounded set of possible futures.	Adaptive policy: Adapt the policy over time as conditions change and learning takes place.	Futures: Use large numbers of possible scenarios that are intended to explore what might happen, given our lack of understanding of the future.

The integrated framework serves as a guideline for selecting the appropriate approaches for improving insight into future developments, and for selecting the appropriate approaches and tools for dealing with future uncertainty in policymaking.

From a PA perspective, the shared approaches offered in the framework serves several purposes:

- It combines the approaches from the FF with those in PA, thereby improving the PA field and providing better support to policymakers;
- It enables policy analysts to verify (through the use of appropriate anticipatory approaches) the level of uncertainty assumed while selecting a policy type for the issue at hand;
- It allows policy analysts to better communicate with policymakers and make a convincing case for applying certain anticipatory approaches.

From a FF perspective, it allows futures practitioners to enhance the uptake of their work in PM, which is considered a win-win situation for both fields.

5. Conclusion and further discussion

The fields of Policy Analysis (PA) and Policymaking (PM) are firmly linked through a shared set of approaches and tools that is structured according to the four levels of uncertainty shown in Table 1. For each level of recognized uncertainty there exist established methods that are well documented in PA. In order to improve the uptake of anticipatory work from the Futures Field (FF) to benefit PA, an explicit link between both fields is established by van Dorsser, Walker et al. (2018). This link connects the various disciplines of the FF to the well-established approaches in PA by considering the various types of futures that the Futures disciplines address and their corresponding levels of uncertainty.

This article has shown how, for each given level of uncertainty, an explicit indirect link can be created between the FF and PM. By linking the FF to PA and PA to PM, an integrated framework is created that provides guidance for selecting the appropriate approach to improve insight into (and thereby deal with uncertainty about) future developments, as well as guidance in selecting the appropriate approach for dealing with uncertainty in PM. The framework is intended to provide guidance on the appropriate use of FF methods in support of PA, such that policy analysts can improve their analyses while at the same time futures practitioners can align their methods with the needs of policy analysts, thereby improving further uptake of FF work in PA.

We discuss here briefly, some applications of the proposed framework for different levels of uncertainty in various policy domains.

For day to day operational decisions, such as the ordering of inventory stock, it is common to apply forecasting tools to optimise operations. These Level 1 methods are extensively discussed in the forecasting literature and offer useful solutions in support of operations management. At this level, the anticipatory field and decisionmaking (or PM) seem well connected.

For problems where the relevant parameters are assumed to be known but subject to statistical variation, as for instance in managing investment portfolios, it is common to apply Bayesian projections and optimise decisionmaking in accordance with the risk attitude of the manager (e.g., by setting a limit to the value at risk (VAR)). Another example can be found in probabilistic weather projections that are based on the probability of a certain weather condition. In these cases, there is also a reasonable link between Level 2 projection methods and decisionmaking.

In some specific cases, probabilistic projections may also be used at the interface of Level 2 and Level 3 uncertainty, where problems may be categorised as Level 3 uncertainty when including all necessary details, but for which uncertainty may be reduced to Level 2 uncertainty when considered at a high level of aggregation. At the aggregated level, it may sometimes, be possible to develop long- term probabilistic projections with an acceptable bandwidth. van Dorsser et al. (2012) show that this may be possible for external developments such as population growth, economic output, or even total freight transport demand in a larger geographic region. Such aggregated long-term projections can subsequently be used as input for the quantification of a coherent set of plausible scenarios, in which the scenario quantifications are expected to remain within a certain confidence interval of the probabilistic projections (van Dorsser, 2015).

The use of the framework and the link between anticipatory research and decisionmaking become more complicated at higher levels of uncertainty because scenarios are considered a primary method for addressing both Level 3 and Level 4 uncertainty. But there are clear differences between scenarios applied at both levels. For Level 3 uncertainty, the aim is to prepare a bounded set of (a few) plausible scenarios in order to seek a policy which does rather well across these scenarios, whereas for Level 4 uncertainty scenarios are intended to explore a broad range of (many) possible futures in order to specify under which future conditions a policy might fail.

In practice this difference is essential, since preparing for a too broad range of possible developments (that may not be plausible) will result in a non-competitive operation for commercial enterprises. Business strategies are usually prepared for problems up to Level 3 uncertainty, since corporate strategies can be stated more clearly if the envelope of anticipated developments is not too wide. In line with Voros' definition, these plausible developments relate to those futures that we think 'could' happen based on our current understanding of how the world works. We define these as those developments that are in line with today's understanding of long-term trends and today's recognised key uncertainties. These indicate the broader opportunities and threats to the business, which, together with the specific strengths and weaknesses of the concerned business, can be used as input to develop 'trend-based' narratives (or trend-based scenarios) on the basis of which new business propositions can be founded. This approach can be useful in areas of major transitions, e.g., the shift from fossil to renewable energy or the shift from raw material exploitation to recycling of materials. The proposed use of trend-based narratives is explored by van Dorsser, Taneja et al. (2018) and van Dorsser & Taneja (2020).

For dealing with Level 3 uncertainty in the public domain, the use of trend-based narratives is often more complicated because policies also need to be made when substantial key uncertainties are involved, whereas if uncertainty becomes too large in business, the business may not be developed at all. In case of substantial key uncertainties, it is common to seek robust policies that work acceptably well across a coherent set of plausible scenarios. Kwakkel & Haasnoot (2019), for example, discuss robustness in general. Another example is discussed by Hastings & McManus (2007), who address robustness in the case of aerospace applications.

When the level of detail becomes too high and the future is too uncertain and too unpredictable (i.e., in the case of Level 4 uncertainties (also known as 'deep uncertainty')) it is recommended to shift to adaptive policies, supported by wildcard scenarios and/or Exploratory Modelling in combination with Scenario Discovery techniques to identify tipping points and potential impacts (Bryant & Lempert, 2010; Haasnoot, Kwakkel, Walker, & ter Maat, 2013; Marchau et al., 2019). Such applications may be found in developing climate change policies and long-term energy and transport policies, which are becoming more frequent (Gerst, Wang, & Borsuk, 2013; Halim, Kwakkel, & Tavasszy, 2016; Shortridge & Guikema, 2016).

The proposed framework is still in a conceptual phase and needs further development and real-world testing. Nevertheless, we think it could help those working in both the PA and the FF to select well-suited approaches for designing solutions to policy problems that they may encounter. Policy analysts can consider the proposed framework in order to identify the anticipatory approaches and relevant insights that can be borrowed from the FF, while futures practitioners can position their work within the framework to increase the uptake of their work in PA.

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