

Risk assessment as rhetorical practice: the ironic mathematics behind terrorism, banking, and public policy

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Abstract

The twin problems of possible terrorist attacks and a global economic recession have been, and continue to be, critical components of contemporary political culture. At the center of both problems is the assessment of future risk. To calculate the probability that a loan will default or to estimate the likelihood of an act of bioterrorism crippling an American city is to engage in the quantitative science of risk assessment. The process of risk assessment is an attempt to rationalize the uncertainty and contingency of the future. In this essay, I read risk assessments made by the Department of Homeland Security and by major banks during the recent financial collapse as examples of rhetorical practice. As such, I show the rhetorical form and function of risk assessments in order to determine the effect that they have on contemporary political culture.

Keywords

bioterrorism, political culture, political rhetoric, rhetoric of mathematics, risk assessment

I. Introduction

According to former U.S. Vice President Dick Cheney, the fact that the United States has *not* suffered another terrorist attack since 9/11 is evidence of the success of American foreign and domestic policy during the years of his service.¹ In addition, the Bush-Cheney Administration justified the invasion of Iraq and the use of torture on suspected terrorists by reference to what *might be possible* or *anticipated attacks*. On November 25, 2002 George W. Bush signed “The Department of Homeland Security Act.” The primary mission of the DHS is to prevent terrorist attacks within the United States, thus giving it the task of peering into the future at any possible or anticipated events and designing tools to prevent such possibilities.² On June 12, 2002, George W. Bush signed the “Public Health Security and Bioterrorism Preparedness and Response Act” into law. This legislation included policies on stockpiling vaccines and funding research into potential medical

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treatment for various infections resulting from potential acts of bioterrorism. Policies like this are concerned with what has *not* happened.

Risk assessment is central to the kinds of policies advanced by institutions like the Department of Homeland Security, and it is also central to what has been happening at the same time in the banking industry. In the years preceding 9/11, J.P. Morgan (and several other major American banks) began selling the risk on the loans that they were making. "Credit-default swaps" became the name for deals that involved a bank paying a fee for some other institution to take on the credit risk of some loan (if the loan defaulted, the institution that bought the credit risk would assume the debt). If the risk of default on loans could be sold, then the loans being made were risk-free, and this meant that lending bankers could take on more loans. "Securitization" then bundled together packages of default risk on these loans and sold the bundles.³ The possibility or anticipation of default served as a check on bank lending, and "credit-default swaps" combined with "securitization" allowed banks to remove that check. By the end of the Bush-Cheney Administration, it was clear that "credit-default swaps" and "securitization" were partly to blame for the collapse of the U.S. housing market and the onset of a major financial recession. The possibility of default became a reality.

The twin problems of possible terrorist attacks and a global economic recession have been, and continue to be, critical components of contemporary political culture and public policy. At the center of both problems is the assessment of future risk. To calculate the probability that a loan will default or to estimate the likelihood of an act of bioterrorism crippling an American city is to engage in the quantitative science of risk assessment. The process of risk assessment is an attempt to rationalize the uncertainty and contingency of the future. Most public deliberation is oriented toward a contingent and uncertain future, and it is the fact of contingency that is generative of rhetorical practice within democratic societies. The purpose of this essay is to consider the ways in which the science of risk assessment operates as a rhetorical practice in contemporary political culture. I aim to show how and what kinds of public arguments and justifications are generated by risk assessment, especially in the cases of research funded by the Department of Homeland Security and the use of risk calculations in the collapse of the contemporary financial system.

Through a critical reading of two cases, I argue that three main effects result from the practices of risk assessment: first, science and math become prescriptive of politics and political choices and offer competing evidence for competing courses of action. Second, risk introduces and solidifies security as a value commensurate with equality and freedom in democratic, public cultures. Third, irony becomes a central mode of acting in a public culture characterized by risk. Risk assessment is an ironic practice in that it produces the opposite of what it seeks (uncertainty instead of knowledge), and it has ironic outcomes (on the one hand, the Bush-Cheney Administration takes credit for something that has not happened, while on the other hand they deny blame for something that has happened).

According to Ulrich Beck (1999) and others, we live in a "world risk society" which is the result of modernization. Social theory has attempted to understand why and how the "risk society" emerged and to describe the conditions of existence within it.⁴ I rely on such social theory throughout this essay to reflect on rhetorical practices. Thus a close reading of the practices of risk assessment through the lenses of both the "risk society" thesis and rhetorical theory can help to refine our understanding of the ways in which modes of communicative action based on science and mathematics operate as a performative basis for deliberation in contemporary public culture. The mathematics and science of risk assessment can be abstruse at first glance, but can be read as forms of communicative action generative of political controversy. By considering both the role of risk management at the Department of Homeland Security and calculations of risk in the

contemporary financial industry, I hope to show how the science–public culture relationship can be rethought from the perspective of the risk society thesis *and* how that relationship can be more fully explained from the perspective of rhetorical theory. To begin such a task, I offer a brief outline of the rhetoric–political culture relationship and the risk–culture relationship.

2. Rhetorical theory and the risk society thesis

Uncertainty and contingency drive political rhetoric, or as Dilip Gaonkar (2001: 151) puts it, “the contingent is the unproblematic scene of rhetoric.” This claim has its origins in Aristotle, who outlined two main characteristics of the relationship between contingency and rhetoric (Aristotle remains one of the most important sources of contemporary rhetorical theory). First, Aristotle made a distinction between the contingent and the necessary in order to carve out a specific domain for rhetoric. If the contingent is opposite the necessary, then it deals with probable knowledge instead of certain knowledge. The contingent/probable becomes the domain of rhetorical practice instead of the necessary, which becomes the domain of philosophy and science. Second, Aristotle also claimed that contingency was a basic characteristic of human actions because humans always have the capacity to act in different ways. Thus, rhetoric becomes the discursive means of deliberation. Wherever deliberation occurs (even in scientific and technical contexts), contingency serves as a backdrop.

Aristotle’s description of the relationship between contingency and rhetoric can be further refined by making a distinction between the contingent as an event and as a property of propositions. A contingent event is one that could possibly occur or possibly not occur. On the other hand, a contingent proposition might or might not be true. This distinction highlights why contingency is taken as a starting point for rhetorical practice. Without contingent events and contingent statements, it’s not clear what we would be deliberating about in political culture. Thus Gaonkar can claim that the contingency thesis stands behind a “cluster of concepts and propositions” concerning rhetoric:

rhetoric is a method for inquiring into and communicating about the realm of the contingent &...; inquiry into the contingent yields opinions of variable validity and utility, but no certain knowledge. Hence, opinion is the material with which rhetoric must work &...; the proper mode of working with opinion is deliberation (involving dialogue and debate) that relies primarily on probable reasoning to make decisions and to form judgments. (2001: 158)

Without some degree of uncertainty and contingency, we would not need to get together to make collective decisions as a public.

Risk analysis and risk assessment are the latest scientific and mathematical procedures deployed with the intention of producing probable knowledge – this is why they belong to the domain of rhetorical practices. These procedures then become the grounds for political deliberation and decision-making. Moreover, risk assessments show how the improbable becomes just as likely to motivate political decision-making as the probable. Juxtaposed with Aristotle’s conception of political rhetoric, a public culture driven by risk assessment is one concerned with consensus about the improbable and not the probable. The very concept of risk serves as a well of probable knowledge from which many different kinds of arguments can be drawn. Risk assessment is generative of probabilistic claims that are then used to guide decision and judgment regarding an uncertain and contingent future. It is at this point that rhetorical theory and the “risk society” thesis collide.

Ulrich Beck claims that contemporary Western societies are living through a transitional period in which industrial society is becoming “risk society.” The most notable fact about this transitional period is that the production of wealth is accompanied by the production of risks, which have proliferated as an outcome of modernization. The central problem that Western societies face is the prevention or minimization of risks, not the production and distribution of goods. The “risks of modernization,” according to Beck, are “irreversible threats to the life of plants, animals, and human beings” (1992: 13). These threats are on an unprecedented scale because they cannot be delimited spatially, temporally, or socially. Moreover, these contemporary risks are more and more difficult to quantify and are open-ended events. In pre-modern societies, common threats (plague, famine, war, etc.) were thought to be incalculable because they were attributable to external causes. Through the advent of modernity and industrialization, however, these threats were transformed into risk calculations through the deployment of a kind of instrumental rationality. The science of probability and statistics, developed in the eighteenth and nineteenth centuries, calculated norms as an embodiment of the belief that reason could bring disorder under control. The modernist concept of risk assumed that unanticipated outcomes were calculable and predictable. As Sanjay Reddy (1996: 237) claims: “Moderns had eliminated genuine indeterminacy, or ‘uncertainty’, by inventing ‘risk’. They had learnt to transform a radically indeterminate cosmos into a manageable one through the myth of calculability.” By the end of the twentieth century, however, these foundations of risk logic, according to Beck, are being subverted and suspended. The risks involved in contemporary society are not calculable because of their non-localized nature and potential long-term effects: “To express it by reference to a single example: the injured of Chernobyl are today, years after the catastrophe, not even born yet” (Beck, 1996: 31).

The more important characteristic of the connection between risk and uncertainty, however, is that the very growth of scientific/expert knowledge that seeks to improve the human condition is the central causal factor for the explosion of risks and the deepening of uncertainty. For example, epidemics of bacterial infections are caused by medicines that have created antibiotic resistant bacteria; the cause of floods, landslides, or famines can be traced back to global warming, which in turn can be understood as a side effect of industrialization. Risks, in contemporary society, are forms of what Beck calls “manufactured uncertainty,” and, as such, they are based on decisions made by the collusion of science, industry, and politics. In other words, human intervention into the natural world (mostly for the purposes of industrialization and the expansion of capitalism) results in unintended consequences and a proliferating scene of uncertainty and contingency. Thus Beck can define risk as “a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself” (1992: 21).

At the core of Beck’s description of the risk society are issues surrounding the constitution of the public sphere and practices of democratic politics:

Much political debate over the last twenty years has centered on the decline in the power and legitimacy of government and the need to renew the culture of democracy. Risk society demands an opening up of the decision-making process, not only of the state but of private corporations and the sciences as well &...; This could encourage environmental innovations and help to construct a better developed public sphere in which the crucial questions of value that underpin risk conflicts can be debated and judged. (Beck, 1999: 5)

We may be initially suspicious of this kind of optimism about democratic life, but Beck’s move relies on the following pronouncement: “Endemic uncertainty is what will mark the lifeworld and the basic existence of most people – including the apparently affluent middle class – in the years that lie ahead” (1999: 12). Once the proliferation and inescapability of uncertainty are in place,

then the conditions are set for the development of a rich public sphere that requires a rich tradition of rhetorical practice.

This is not, however, the rational public sphere of polite conversation described by Habermas or a rational system of governing nation-states. The politics of the nation-state or the public sphere of the coffee house are not viable visions of political culture in a “world risk society.” Instead, Beck uses the concept of “subpolitics” to describe “politics outside and beyond the representative institutions of the political system of nation-states.” More specifically, “subpolitics means ‘*direct*’ politics – that is, *ad hoc* individual participation in political decisions, bypassing the institutions of representative opinion-formation” (Beck, 1999: 39). In addition, “there are no expert solutions in risk discourses, because experts can only supply factual information and are never able to assess which solutions are culturally acceptable.” Politics, therefore, “gains priority over expert reasoning” (Beck, 1999: 42). What happens within a risk society is that competing rationalities and experts begin to generate controversies regarding methods, orientations, calculations, procedures, objectives, standards, plans, etc. Debates between expert groups or persons undermine the authority granted to these groups by shifting the burden of judgment and the location of deliberation (from out of the science lab and into the public sphere). The prevailing Enlightenment sentiment was that “if one simply conducts research long enough, then the opposing arguments will fall silent and clarity and unanimity will prevail” (Beck, 1999: 100). But research that goes further and further actually “heightens the need to justify things and the uncertainty of all arguments” (1999: 100). The word “justify” here opens the door to the rhetorical tradition with its emphasis on reasoning and argumentation. Rhetorical practice is at the center of the risk society, and the competition between experts makes this clear.

This initial, brief discussion of the relationship between rhetoric, contingency, and political culture and Beck’s social theory of risk outlines the intellectual conditions within which we can understand certain aspects of the two most important political events of the last ten years: the war on terror and the global financial collapse. For the most part, rhetorical studies has been concerned with elaborating the ways in which risk is socially constructed and demonstrating how risk communication is not a straightforward, technocratic project but a difficult rhetorical enterprise that requires many different actors (Sauer, 2003). This general insight surely corroborates Beck’s basic views, as well as those of other social theorists of risk such as Joost van Loon (2002) and Piet Strydom (2002). But the rest of this essay will pursue more than just a form of rhetorical criticism that shows how risks are invented. Instead, through the following two case studies, I hope to show how the *topos* of risk rhetorically generates the texture of contemporary political culture and to outline the political/cultural functions of the use of risk assessment as a rhetorical practice. Beck’s social theory brings us to the precipice of rhetorical studies by demonstrating the function of probability and uncertainty in guiding public deliberation. Rhetorical theory and rhetorical criticism can be used to develop a more sophisticated understanding of the ways in which the concept of risk, by virtue of its reliance on uncertainty and probability, influences public culture. Therefore, I hope to offer a rhetorical interpretation of Beck’s social theory for the purposes of showing how the language of risk assessment manufactures a feeling of security within the context of growing contingency.

3. Case #1: Risk management at the Department of Homeland Security

During his Senate confirmation hearing, Department of Homeland Security Secretary Michael Chertoff insisted that risk assessment be at the center of homeland security work: “DHS must

base its work on priorities driven by risk” (Masse, O’Neil and Rollins, 2007: 1). Since Chertoff’s appointment, the practices of risk analysis and risk assessment have influenced all of the department’s efforts to prevent terrorist attacks. In the fiscal year 2009, DHS spent nearly \$1.8 billion funding grants related to “preparedness” research that relies on risk assessment tools to determine the possibility of attacks.⁵ The report goes on to acknowledge the difficulty of terrorism risk analysis and assessment: “Regardless of the complexities of the risk assessment methodology, due to the inherent uncertainties associated with assessing risk in a dynamic counterterrorism context, some level of flexibility in managing risk may be necessary” (Masse et al., 2007: 5). Because of the “dynamic nature of terrorism” and the “lack of a rich historical database of terrorist attacks” probabilistic assessments are less developed in the field of national security than they are in the financial and insurance industries. This line of reasoning is part of the basic rhetorical structure of risk assessment in general, and it proceeds like this: risk assessment is complex and it always deals with uncertainty; terrorism is an especially difficult case because it is “dynamic,” which means it is constantly changing/evolving; this means that we must be “flexible” in managing risk. It is the conclusion that is most striking. Here “flexible” has a hidden, double meaning: it means that we must be flexible in how we use the results of risk assessment to actually implement management policies (or assessments are not solutions), which is just another way of saying there is no straight, clear connection between assessment and prevention. In addition, it means that the actual results may be useless because terrorism is an ever-changing phenomenon that, by the time we have analyzed it in one way, has morphed into something else that cannot be captured by the present models.

Risk assessments constantly undermine themselves by eliding questions of judgment, which is exactly what the preceding report does by introducing the importance of the “flexibility” of the interpretation of the results. In order to understand how they do this, we must turn to the forms of risk assessment employed by the DHS. Perhaps the best place to see this kind of work is in the “Department of Homeland Security Bioterrorism Risk Assessment” from 2008. This report begins with the assertion that “the threat posed by biological agents employed in a terrorist attack on the United States is arguably the most important homeland security challenge of our era” (Committee on Methodological Improvements, 2008: 1). This is an egregious example of begging the question. The report, presumably, is designed to determine the severity of the threat posed by biological hazards, but it has already determined, on the first page, that the threat is our “most important” challenge. The whole process of risk assessment is in general a form of begging the question. It assumes that some event or thing is dangerous and then seeks to determine the quantifiable danger, but regardless of the final numbers, the probabilities can only confirm the original assumption – a threat is by definition dangerous.

This report from 2008 was based on an earlier 2006 report that, with the exception of some sections made available through the National Research Council, remains classified as “secret.” This means that we do not have direct access to the probabilities that the government report generated. We do know that the DHS contracted this work to Battelle Memorial Institute in Columbus, Ohio, and that its results were based on a complex, computer-based model of estimating the risks associated with 27 natural pathogens and one engineered agent (multidrug resistant anthrax). The purpose of Battelle’s work was to rank each pathogen according to its level of risk. These rankings were based on “subjective event probabilities” and their potential consequences. Where did Battelle get these “subjective event probabilities” (Committee on Methodological Improvements, 2008: 45)? “Biological weapons experts” provided them and then computers simulated the consequences. The purpose of these calculations is to prioritize federal investments in countermeasures. Battelle, in this case, relied on “multi-attribute analysis” as a methodology for ranking the

risks associated with each pathogen (Vlek, 1996: 9). “Multi-attribute analysis” is a mathematical tool designed to prioritize risks and evaluate alternatives when outcomes are uncertain and conflicting objectives are present. By establishing priorities, risk management decisions can be made on the basis of the rankings.

This form of risk assessment is a four-step process. First, in the “initial threat definition” step individual experts are asked to determine which threats are potential risks and to order the threats from greatest to least concern. The second step requires individual experts to determine the “risk assessment attributes,” or a potential consequence of an attack, such as structural damage to buildings, financial losses, etc. Then, in the third step, individual experts rank each “attribute” in order for an automated tool to construct and conduct attack simulations. This allows for the creation of a “threat index” which is a probability distribution that allows an analyst to rank the threats. In the final step, the “threat index” is compared to the initial rankings made by the experts. In the case of bioterrorism, the 28 pathogens were ranked initially by a panel of experts on a scale of 1 to 3, with 1 constituting a low threat and 3 constituting a “high threat,” according to 28 “attributes” (for example, the ease of acquisition, etc.). A threat index was then produced to determine the probability distribution of the 28 pathogens. Most forms of risk assessment follow a four-step procedure. That four-step procedure usually involves some form of “hazard” or “threat” identification (which determines the danger), some form of “hazard” or “threat” characterization (which determines the likelihood and kind of adverse effects), some form of “hazard” or “threat” assessment (which determines a probability of adverse outcomes), and finally some form of “hazard” or “threat” characterization which summarizes the results of the second and third steps and predicts the possibility of certain outcomes and the effectiveness of countermeasures. In addition, risk assessments usually include a final section of “what-if scenarios” that simulates outcomes and tests intervention strategies. The difference between forms of risk assessment is the use of mathematical functions to calculate the probabilities and determine the distributions.

The bioterrorism risk assessment goes slightly further than many other kinds of risk assessment, however. Because this form of assessment deals with active human agents (and not just pathogens), bioterrorism assessment must include a range of possible attack strategies that an intelligent adversary might pursue. Thus event trees and decision analysis are added to “multi-attribute analysis” to make risk management possible. An event tree starts with some initiating event (in this case a terrorist attack with anthrax, for example) and then outlines a sequence of corrective responses to that event, arrayed in a series of steps.⁶ The probabilities of successful occurrence of the corrective responses are estimated from existing data, and then the probabilities of each sequence of events are aggregated mathematically to provide estimates of the probabilities of various outcomes. Then decision analysis is used to identify, represent, and formally assess important aspects of a decision situation and to prescribe best possible courses of action by applying the maximum expected “utility action axiom.” Event trees and decision analysis, when married to risk assessment, are the Department of Homeland Security’s primary method of risk management. It is from the combination of this kind of research and these tools that “preparedness and response” activities and programs are established (like TOPOFF 3, a WMD preparedness drill) and “protection and prevention” laws are written (like the “chemical facility anti-terrorism standards”).

Read rhetorically, risk assessments like this one are replete with the use of metonymy and irony. The first section of the assessment, “threat definition” clearly illustrates Kenneth Burke’s conception of metonymy. According to Burke, metonymy and reduction are substitutes for each other. He understands metonymy as a basic strategy of what he calls “scientific realism” (Burke, 1945: 505). From such a perspective, “any attempt to deal with human relationships after the analogy of naturalistic correlations becomes necessarily the *reduction* of some higher or more

complex realm of being to the terms of a lower or less complex realm of being” (p. 506, emphasis in original). Implied here is that for the scientist metonymy serves an ontological function, in that it certifies the reality of a new attribute. By reducing what exists to some other property, the scientist establishes the reality of this attribute (see also Wynne, 2005). This new “reality” is now also a production. Terrorism, in this case, is reduced to the use of 28 possible pathogens with specific public health consequences. In other words, pathogens like anthrax make the vague and complex concept of terrorism real in a reduced and specific sense. The elaborate language that then describes the possible use of anthrax in a terrorist attack makes this form of terrorism real. Once the risk assessment procedures turn threat definitions into probabilities, then it engages in a special form of metonymy that shares some general features with synecdoche: “the substitution of quantity for quality &...; would be a metonymy.” Synecdoche (understood as representation) “stresses *relationship* or *connectedness* between two sides of an equation, a connectedness that, like a road, extends in either direction, from quantity to quality or from quality to quantity” (Burke, 1945: 509). But in this case, “reduction follows along this road in only *one* direction, from quality to quantity” – scientific realism, according to Burke, confines itself to this metonymic or uni-directional sense (p. 509, emphasis in original).

Metonymy, therefore, operates at two levels in this, and all, risk assessment. First, a “hazard” or “threat” is always already a reduction from something more complex. In this case, terrorism is reduced to the use of anthrax (the practice of reduction takes place in all such risk assessments – food poisoning, for example, is reduced to the presence of *E. coli* bacteria). Second, that new characteristic is then translated into a quantity by a mathematical function. In this case, probabilities are then compared and ranked to determine the most likely threat. This should not be a surprise given that Burke tells us this is the central linguistic strategy of “scientific realism.” In this case, these numbers then serve an ironic function. According to Burke the substitute for irony is dialectic. In treating the irony-dialectic pair, Burke traces the interaction of opposing terms. In some cases, this interaction makes dramatic development possible. Burke draws from literary examples, a vastly different genre of work than what is analyzed here, to make his point. In the light of these literary examples, the question, for Burke, concerns the results of this development: “As an overall ironic formula here, and one that has the quality of ‘inevitability,’ we could lay it down that ‘what goes forth as A returns as non-A.’ This is the basic pattern that places the essence of drama and dialectic in the irony of the ‘peripety,’ the strategic moment of reversal” (1945: 511). Despite the immediate application of this passage to drama, Burke has offered an excellent description of what is happening in this risk assessment. In this case, what goes forward as a project of producing knowledge returns and ends as non-knowledge. If one poses the most basic question that arises in the light of a document like this – how likely is it that we will suffer from bioterrorism? – one must answer “I don’t know.” This is the irony of every risk assessment.

The authors of this government document are aware of this irony themselves:

subjective probability is dynamic. It is assessed at some fixed point in time and the assessment is presumably based on information at hand at that fixed point in time. As time marches on, new information could become available, and with it a possible change in probability &...; It is because of the above caveats that de Finetti in the introduction to his famous two-volume book on probability declares that: “Probability Does not Exist.” (Committee on Methodological Improvements, 2008: 112, emphasis in original)

This statement makes two astonishing admissions: first, it declares that at the moment at which it is published and read the information within it is no longer accurate. In other words, risk assessment is based on “dynamic” probabilities and given that it is impossible to arrest time it is also

impossible for those probabilities to be accurate. Second, the probabilities and rankings within this document, and other risk assessments, are not real. If they are not real, they are chimerical inventions. But they are, by the document's admission, inaccurate inventions with little relationship to reality. What kinds of inventions are they? They are, as Lisa Keranen (2008: 233) tells us, "fantasy documents." They stage, and provide the illusion of, organizational competence in order to persuade the public that the government is legitimately protecting its people's security. They function less to prevent risk than to assuage public fear and worry.

The computer programs that produce the probability distributions also run simulations to determine best practices along the event trees. The realist rhetoric that describes hazards quickly and easily is transformed into fantasy within these programs as well. Simulation becomes the key tool of the Department of Homeland Security. It is at this point that the topos of risk, the rhetorical function of irony, and Beck's risk society thesis combine around questions of politics and culture. Risk assessment is a tool for rationalizing uncertainty. This is another way of saying that the calculations provided by the bioterrorism risk assessment give us something to say about the likelihood of an attack. Whatever we might say will be based on probable knowledge, and, therefore, uncertainty cannot be eliminated. This assures us that political discussion about risk will not end. It also insures that the concept of risk will operate as a critical "topos" (in the Aristotelean sense) of contemporary politics because it will be generative of lines of argument. Most strikingly, however, the topos of risk provides the most fertile ground for exercises in rhetorical invention. Simulations, fantasies, risk assessments, however we choose to classify such inventions, they never serve the avowed function of "scientific realism" – to describe the world as it is. Instead, they serve the opposite function – to invent the world as it might be in the future. More important, these inventions use the highly improbable to generate arguments. Instead of relying on the highly probable knowledge of the community to conduct political deliberation, risk assessments provide political culture with highly improbable scenarios that grip the imagination and lead to any number of political consequences. This is an ironic outcome, given that the function of science is often thought to be the opposite of invention, and that science often pursues the certainty of the highly probable and not the uncertainty of the highly improbable. These simulations, fantasies, or risk assessments function ironically in that they produce the opposite of what they seek: more uncertainty instead of less. Risk as a topos, therefore, produces proliferating discourses and competition between such discourses (all around improbable events instead of probables). Moreover, risk assessments suspend judgment because of endemic uncertainty and beg the question as to what the most pressing dangers we face are. They allow us to simulate and stage acts of effective government.

4. Case #2: Value at risk and mortgage-backed securities in the great recession

Perhaps the gravest irony is that as the U.S. government spent billions of dollars funding risk assessments, staging preparedness drills, and determining the probabilities of bioterrorist attacks, it paid little attention to the financial industry's activities. In other words, staging government action became more important than real government intervention. In part this was because the risk of financial collapse seemed so small, and banks had the mathematics to prove that. Most major investment firms and large banks use complex mathematical models for measuring the risk in their investment portfolios. As with any form of risk assessment, many different kinds of models are used. One of the more common models is called "VaR," or "Value at Risk."⁷ This tool is used to measure the boundaries of risk in a portfolio over short durations, assuming a "normal" market. For example, if you have \$1 million of weekly "VaR," then, over the course of the next week, there is

a 99% chance that your portfolio will *not* lose more than \$1 million. In other words, it is a single, summary, statistical measure of *possible* losses, in which losses greater than the value at risk are suffered only with a very small probability – just like risk assessments of terrorism, “VaR” deals with highly improbable future possibilities.

A “VaR” statistic has three components: a time period (as short as one day but usually no longer than a couple of months), a confidence level, and a loss amount. It seeks to answer the question: what is the most I can, with 95% or 99% confidence, expect to lose in dollars over the next month? There are three basic methods of arriving at this figure. First, the historical method reorganizes actual historical returns on investments and assumes that history will repeat itself. In this method, the worst days the market has experienced become the parameters for the probability distribution. Second, the variance-covariance method assumes that stock returns are normally distributed, which requires an expected return and a standard deviation to be calculated. One normally arrives at the expected return based on past performance. Third, the Monte Carlo Simulation randomly generates trials that, when averaged together, produce a probability distribution. Any one of these methods will use the following basic formula: using a probability of x percent and a holding period of t days, an entity’s value at risk is the loss that is expected to be exceeded with a probability of only x percent during the next t -day holding period.

All three methods of calculation rely on historical data and produce a normal distribution. Risk managers can use “VaR” to measure both individual risks and an entire firm’s risk, and thus the numbers are used to quantify a firm’s relative risk position. In the late 1990s, the Securities and Exchange Commission ruled that firms had to include a quantitative disclosure of market risks in their financial statements, and “VaR” was the method for doing this. The Basel Committee on Banking Supervision validated “VaR” and allowed firms to rely on their own internal numbers to establish capital requirements (the amount of money that needed to be set aside to cover risks that might go bad).⁸ This gave firms an incentive to have a reasonably low “VaR” so that they did not need capital on hand to service potential defaults (if these firms needed less capital on hand as a check against default, then they could lend or invest more). These calculations contain two problems that have become important nodes of controversy in arguments about the cause of the financial crisis. First, “VaR” assumes that the future will be like the past and uses past market returns to generate future predictions. Alan Greenspan identified this problem: “The whole intellectual edifice, however, collapsed in the summer of last year because the data input into the risk-management models generally covered only the past two decades, a period of euphoria. Had instead the models been fitted more appropriately to historic periods of stress, capital requirements would have been much higher and the financial world would be in far better shape today” (quoted in Cohen, 2009). For a tool that supposedly helps us predict what will happen tomorrow, these calculations are basically future-blind. Second, risk managers are usually concerned with what happens in the middle of the normal distribution (within the 99% probability) and not with what happens at the far edges (or the 1% probabilities). The fact that 99% of the time we know we will not lose more than a certain amount tells us nothing about how much we might lose the other 1% of the time. Nassim Nicholas Taleb (2007) calls these “black swans” and calls “VaR” a “fraud.”

These measurements are only half of the risk assessment story in the financial crisis. The other half lies in how credit risk was calculated by these same firms.⁹ Instead of determining the probability that a firm might lose a specific sum on an investment, credit risk is the possibility that a loan will default and that some financial institution will be left responsible for the debt. The measurement of the credit risk of lending usually follows the same form as the “VaR.”¹⁰ Historical data are required to measure credit risk. In addition, the default rate for specific loans, the amount of the loan, the recovery rate, and the correlations with other loans are also necessary. Simulation

techniques use these input data to develop a loss distribution, whereby it is possible to calculate the expected loss, variance, and maximum loss at the 99th percentile. Computer simulations are run to determine the maximum loss that a portfolio of loans might incur and then those simulations are compared to the estimated maximum loss. One of the most important financial innovations of the last ten years was a formula for determining the credit risk of mortgage-backed securities. Once a formula could determine the maximum loss given a certain degree of confidence (just as the “VaR” does), then it could label the bundles of loans being sold according to the standard rating system (AAA meaning “credit risk almost zero,” B+ meaning “speculative investment,” etc.). Ratings assigned to borrowers form the basis for credit risk management, and they operate as the starting point for determining the level of interest rates, credit limits, and capital requirements required for banks to be able to manage defaults. AAA rated securities (which were determined to be risk-free by computer simulations and mathematical equations) eventually collapsed in an unpredictable fashion because of extensive foreclosures.

Measurements of “Value at Risk” and credit risk have the same rhetorical form and function. Both usually require at least four steps. First, historical values of market factors must be determined. Market factors can range from interest rates to changes in home prices, depending on what kind of risk you are trying to measure. Second, a portfolio (whether it is a portfolio of investments or bundled loans) is subjected to changes in the relevant market rates and historical data from the most recent 100 days of business. This is able to provide a calculation of a hypothetical profit/loss figure (for “VaR”) or default rate and losses (for credit risk) for each of the 100 days of business. Third, the profit/loss figures (for “VaR”) or amount of loss (for credit risk) are ordered from largest profit to largest loss or smallest loss to largest loss. One could also use standard deviations (based on past market factors) of changes in values (for “VaR”) or loss distribution (for credit risk), or random simulations to generate these standard deviations. Fourth, for “VaR,” one selects the loss that is equaled or exceeded 1 percent of the time (in this case, using 100 days, this is the day with the worst loss), and this becomes the value at risk. For credit risk, the 99th percentile of the distribution identifies the maximum loss, and this becomes the value at risk. The amount of time and data put into the equations can and does change. In the case of credit risk, correlation (the chances of one default leading to another) must also be factored into the equation. Regardless, the final product is a graph that identifies what normally happens 95%–99% of the time, and the parameters of maximum losses establish the value at risk.

Reading these formulae rhetorically, metonymy and irony are at work just as they were in the bioterrorism risk assessment. The goal is to produce a probability distribution that can be reduced to a single number representative of risk. That single number, when one looks at a normal distribution, exists at the margins of the graph and, given its position, signifies how unusual it is for an institution to suffer loss of that magnitude. Metonymy operates in two ways: first, all financial risk assessments are mathematical equations that seek to reduce an overwhelming amount of historical market data to a simple graphic representation. The reduction of many numbers to one number certifies the reality of the new value-at-risk number. In other words, the reduction that takes place through the solving of a mathematical formula has an ontological function of calling a new number into being, just as Kenneth Burke would predict. That new number is representative of something that did not exist before, and that new entity becomes more important than any other market factors or data. Second, these risk measurements collapse the distinction between quality and quantity and reduce all qualitative measures of risk to a number that then has a quality of its own. The smaller the value at risk the *better* the financial position. This reverses the traditional financial logic of: the better the financial position the smaller the value at risk. Judgment and incentive, therefore, are rendered explicitly in quantitative terms. The rhetorical outcome of this

kind of use of metonymy is a new warrant for investment decisions involving new strategies for loan-making. In other words, the new numbers warrant additional investments, credit-default swaps and all sorts of different, otherwise risky, financial investment practices. The quantitative reduction and ontological production of risk makes the justification for the invention of new financial instruments possible and rational.

The irony here is that these new numbers, and the warrants for investment practices entailed by them, were not able to effectively guide decision and judgment. “Value at Risk” was not able to predict the financial collapse, nor were calculations of credit-default risk able to predict the number of defaults on home loans that happened in 2008 and early 2009. These elaborate tools ended up doing the opposite of what they intended to do – they put financial firms in danger of collapse instead of insulating them from risk. But financial analysts seemed to be aware of this irony, just as the Department of Homeland Security is aware of it. In fact, Glyn Holton (2004), in the *Financial Analysts Journal*, quotes the same passage that DHS does from de Finetti (only in greater detail): “Probability does not exist &...; Probability, too [like witches and fairies], if regarded as something endowed with some kind of objective existence, is no less a misleading misconception” (p. 19). Probability is a metric of uncertainty and unreality, not of certainty or reality (even financial analysts know this). The problem, however, is that metonymy has an ontological function and calls something new into existence. Risk is manufactured through these mathematical assessments, and, therefore, it is a kind of manufactured uncertainty – just as Ulrich Beck tells us. Risk exposes us to uncertainties, calls our attention to them, and highlights their presence (as any good rhetoric does), and it makes us self-aware (or self-reflective, as Beck might put it). The irony here is that these mathematical tools are designed to aid us in the task of judgment, but by exposing us to uncertainty (in a highly technical garb), they render judgment more difficult – the financial collapse is evidence of this fact.

What, then, is the rhetorical function of risk assessment in the financial industry? First, this kind of quantitative analysis produces controversy and uncertainty. The debate over the role of “Value at Risk” formulae clearly demonstrates the level of controversy that has already been generated by these techniques of analysis. Second, risk assessments become tools for invention and creativity. The last twenty years has been, perhaps, the most creative era in banking in world history. We have witnessed the invention of countless new financial tools, instruments, and products. The calculation of risk makes possible this kind of innovation by providing a warrant, or justification, for specific practices that may have seemed irrational thirty years ago (or by a simpler logic). This justification is strictly quantitative and takes on qualities of its own based only on its existence as a number. Third, risk assessments manufacture the simulation of security – they pose or stage security. Once a number indicates a firm’s risk, then that firm produces its own security by making sure that number stays within certain parameters. But this was not able to actually insulate major financial firms from economic collapse, and it made those same firms blind to the actual dangers they faced. The simulation of security becomes more real than what is actually happening in the marketplace.

The rhetorical function of risk assessment in the financial industry is illustrative of a larger shift in political culture. When the feeling of security reigns, when mathematics can demonstrate the low level of danger, then politics fades away. When the feeling of danger is magnified and produced, politics must operate to attempt to manufacture feelings of security (as the Department of Homeland Security clearly exemplifies). The topos of risk invents and solidifies the place of the security/danger dualism in larger public culture. And the highly improbable can be used toward any end – either to politically amplify the sense of danger or to produce a sense of security. The mathematics behind the topos of risk is able to simulate security or danger, and thus serve as

the tool for producing and alleviating political controversy. This mathematics is not certain or objective, but is a metonymically reductive rhetoric capable of manufacturing uncertainty and turning us toward a future about which we know nothing (and mistakenly convincing us to rely on the past as a clear indicator of what will happen in the future). Risk assessment is a tool for destabilizing judgment, and, as such, its rhetorical function is to make political decision-making more technical, less attentive to what Aristotle might call common sense, and more attuned to the possibilities and fear of catastrophe. Most importantly, risk assessments imply that political decision-making ought to be concerned with the highly improbable and not with the highly probable. This is a stunning reversal of rhetoric's place in guiding political deliberation.

5. Irony and rhetorical citizenship in the world risk society

As a rhetorical trope, irony expresses the opposite of what is said. In other words, meaning is substituted by its semantic opposite. As a way of interpreting life, irony operates when one appears to be one kind of person (ignorant) but is actually another kind (intelligent). As existence in its entirety, irony can be understood as the condition in which all things entail their opposite – in this way, it highlights the frailty and limitations of human existence (Oesterreich, 2001: 404–406). Risk assessment exemplifies all three modes of irony. As rhetorical trope, risk assessments should be read ironically in that their semantic meanings are the opposite of what appears. When the Bush Administration declares that a biological terrorist attack is the gravest national security threat that we face, we must surely read this as an indication that the probability of such an attack is low and that they must rhetorically perform the task of amplification to make people afraid. When financial risk assessment tells us that an investment is safe, we must assume that such an assessment tells us that it is dangerous. The rhetorical performance here diminishes fear to manufacture security. We are warned that the quantitative figures invented in both cases are not real, and so we must read them as not measuring what they claim to measure. Read as an interpretation of life, risk assessments are designed to enhance our capacity for judgment and decision-making (and, in many ways, they appear to exude a kind of intelligence), but they function in the opposite fashion. Risk assessment renders the reader less able to make judgments in uncertain circumstances and actually appears to lack the kinds of intelligence necessary for engagement in decision-making – prudence and wisdom. From the perspective of the rhetorical tradition, risk assessments are demonstrably imprudent and unwise. As existence in its entirety, risk assessments are the grounds for life in Ulrich Beck's risk society, in which scientific work produces uncertainty and danger. Citizens in a risk society reflexively question everything because science and mathematics teach us that we know nothing.

Risk is concerned with the quantification of uncertainty. Political culture exists as a way of dealing with uncertainty. In a risk society, risk assessments pose as instruments for dealing with uncertainty but are ironically ineffective at that task. Risk assessments are effective at generating political controversy, but not at solving such controversies. In the case of the financial industry, risk assessment can also effectively de-politicize aspects of our life by producing a rationalized sense of security. In this way, science and math are no longer descriptive projects, but are prescriptive of political culture. That which highlights or produces uncertainty stands at the center of political culture. In our moment, it appears that risk serves that function. Security then becomes the goal of political culture in a risk society, freedom and equality may be ancillary goals but they do not necessarily drive political controversy. Rhetorical citizenship in a risk society requires the ability to read scientific and mathematical documents both as moral statements about our political culture and as ironic documents that contain the opposite of their semantic meanings. Numbers

are tropes. They may signify abstract quantities and legitimate and warrant arguments within specific language games, but they also amplify, highlight, and turn our attention to that which they are not. Moreover, these numbers manufacture uncertainty by serving an ontological function. Although each risk assessment employs a strategy of reduction, the next step is always more calculation, research, and data. Because risk can never be eliminated, the only certainty is that the rhetorical production of risk assessment will continue unabated. All of the mathematical calculations present in a risk assessment lead, inevitably, to more rhetorical practice. Because of this, judgment is not a matter of knowing the math or trusting your experience. Instead one can be persuaded by any one of a number of competing claims. Math is just one strategy for persuasion among a set of other possible strategies – math has no special claim to authority (other than the authority it borrows from the general ethos of scientific practice). To decide whether or not to invest or loan money is to engage in a complicated rhetorical task of weighing evidence (sometimes competing evidence) in the face of uncertainty. Scientific demonstrations teach us that we cannot rely solely on our experience to make the best decision, but risk assessments also demonstrate that mathematics can't give us the right answer either. We are on our own, navigating the contingent world of potential dangers with no certain guide and only the swirl of competing rhetorics attempting to persuade us one way or the other.

In the rhetorical tradition, deliberation is the genre of rhetoric that concerns the political. The central characteristic of deliberative rhetoric is that it is aimed at the future. Risk assessments are deliberative documents in that they attempt to predict the future and recommend strategies for effectively coping with future dangers. In this sense, each risk assessment is a kind of political rhetoric. This is made possible by the use of probabilities. Probability theory takes as its main aim the discovery of the plausibility of some event happening. To characterize the probable is to determine that which happens often (as is the case in the rhetorical tradition's use of the probable). But in the case of risk assessment, the purpose of the probabilities may be the same, but such calculations discover the implausibility or infrequency of some event happening. This is what makes these probabilities political and not just scientific. Because these probabilities never converge on a degree of one, continued uncertainty, debate, disagreement, and fear over the future are inevitably present. Once the fear of the future is firmly in place (a fear that will never be erased because the probability of a risk will never be zero), political action is inevitable. Risk is exposure to culture that is politicized because it turns our attention to uncertainty and to what has *not* happened. A form of mathematical sophistry makes this feat possible.¹¹

Notes

1. On May 21, 2009, former Vice President Dick Cheney delivered a national security speech at the American Enterprise Institute that defended the Bush Administration's policies. For full text see: <http://www.cnn.com/2009/POLITICS/05/21/cheney.transcript/index.html> (accessed July 1, 2009).
2. A growing literature on risk management strategy deals explicitly with such problems (see Heng, 2006). Although I do not engage this literature directly, this research tracks the ways in which risk measurements alter political policies in dynamic and important ways. As such, my rhetorical analysis complements and extends such research by focusing on the discursive operations of those policies.
3. "Securitization" is the financial practice of pooling various kinds of contractual debt and selling that debt as bonds to various investors (see Raynes and Rutledge, 2003). I am not referring to the international relations understanding of this term.
4. Beck's "risk society thesis" has been a significant contribution to work in the public understanding of science for several years (see Mellor, 2010; Stilgoe, 2007; O'Neil, 2003; Goshorn, 1996). I hope to add to this conversation about the relationship between Beck's social theory and the public understanding of science through the lens of rhetorical criticism and rhetorical theory.

5. http://www.dhs.gov/ynews/releases/pr_1245074657821.shtm (accessed July 1, 2009).
6. On event trees and their relationship to risk assessment see John Cohnrssen and Vincent Covello (1989).
7. See Philippe Jorion (2000).
8. Joe Nocera (2009).
9. See Felix Salmon (2009).
10. Akira Ieda, Kohei Marumo, and Toshinao Yoshiba (2000).
11. I mean this, of course, as a compliment to the mathematicians that practice this form of analysis.

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