Do Differing Analyses Change the Decision?

Using a Game to Assess Whether Analytic Approaches Improve Decisionmaking

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Preface

Although the U.S. Department of Defense (DoD) increasingly recognizes that many traditional force planning tools do not sufficiently address deep uncertainties in the U.S. security environment, DoD has been slow to adopt alternative analytic methods and tools that have shown merit in supporting decisionmaking under uncertainty in non-defense applications. One potential reason for this lag is a lack of evidence regarding how different forms of analysis could improve DoD decisions—including both the process of making decisions and the resulting choices. The research effort outlined in this report sought to fill this void by developing a structured comparison game design for assessing whether and how the type of analysis presented to decisionmakers affects the decision. The game presented two types of analysis to players simulating mid-level and senior officials and then asked them to assess trade-offs among alternative military force structures, recommend one of the options, and characterize the decision in light of an unfavorable future scenario.

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Summary

Although the decision analysis community creates promising novel methods, tools, and paradigms, it frequently faces obstacles when trying to move those innovations from the academy to the boardroom or the White House Situation Room. Without clear evidence of a new method's strengths compared with traditional approaches, it is difficult to justify the costs associated with change. These costs can include investing time and resources into new processes, organizations, technologies, personnel, and even mindsets about what constitutes best practice. Such investments are hard to justify if one cannot show the *value proposition* of an innovative approach—that is, that it actually improves decisionmaking processes and resulting decisions. However, without an application to evaluate, such evidence may be in short supply.

This study begins to fill this paradox by assessing the influence of different analytic methods on the decisionmaking process and resulting decisions in conditions of deep uncertainty. To do so, we designed a structured comparison game to assess how decision tools and frameworks affect the process and result of decisionmaking. Next, we built and ran a prototype game focused on force planning to observe how former mid-level and senior U.S. Department of Defense (DoD) officials reacted to receiving two different types of analytical inputs in their pregame briefing: (1) a traditional, scenario-based analysis and (2) an analysis generated by a more novel method—Robust Decision Making (RDM)—that had been developed in previous RAND Corporation work.

Based on the previous RAND research, we hypothesized that the RDM analysis would produce decisions that accounted for a wider range of possible future events. As a result, we expected discussion after the RDM analysis to include more about how likely different scenarios were and which were most concerning. We also expected that, after players saw how their selected alternative fared in a challenging scenario, they would feel less sense of surprise than they did when their decision was informed by traditional analysis.

Players were asked to decide among several force structure options. The goal was to assess whether and how the pregame briefings generated by different analytic methods—the analytic inputs presented to mock policymakers—changed the process and decisions of simulated DoD decisionmaking. The analytic methodologies (scenario-based versus RDM) and the decision (force structures options) were chosen because RAND already had extensive experience with both from previous projects.

We conducted four rounds of the prototype game. Two rounds were conducted on Day 1, using players who had served in staff but not leadership roles, and two rounds were conducted on Day 2, with players who had served in senior DoD leadership roles. In Round 1 on each day, the analytic input presented to players was a traditional scenario-based analysis. Players were allowed two moves. The first move was a decision about military force planning. Players were then given one of four different scenarios containing information about real-world developments

(mostly unfavorable to U.S. interests), and, in a second move, players discussed how they might have changed their decision or decisionmaking process.

To study the game results, we used a mixed-methods approach that consisted of observational and thematic analysis, measures of discussion content, argumentation style, and social dynamics.

Although the decision to be made in the game was about military force planning under uncertainty at DoD, we believe that the approach laid out in this report can be applied to other problems, organizations, and analytical methods.

Insights

This research is inherently exploratory and proof-of-concept in nature, thus limiting the strength of our findings. Nonetheless, the mix of thematic and observational analysis generated the following insights that justify further research:

- **Type of analysis has an effect on the decisionmaking process.** Research team observations of game play suggested that the type of decision analysis offered in the pregame briefing affected the course and content of debate among decisionmakers. Our thematic analysis confirmed these observations but also suggested that the effects may have been weaker than supposed.
- **Type of analysis has a weak effect on resulting decisions.** The form of analysis—traditional analysis versus RDM analysis—had some effect on resulting decisions, but the effect was not strong. Several factors about the setup of our game may explain the small difference between the outcomes in the two conditions. These potentially confounding factors do not negate the hypothesis that different analysis would lead to different decisions. Refinements in the methodology of the game and repeated play may produce stronger evidence about the effect of analysis on what decision is made by players.
- **Player experience appeared to have a larger effect on the decisionmaking process and resulting decisions than the type of analysis presented did.** Both the content of the debate and the decision differed between mid-level and senior groups in both experimental and control conditions. The research team observed that senior players were more skeptical of RDM analysis and, in general, favored a traditional, scenario-based approach.
- **Player experience seemed to affect the realism of the simulation.** Observational analysis also suggested that player experience affected the realism of the debate—even more specifically than the content of the debate.
- **Games may help improve the utility of policy recommendations.** Independent of the value of the game for identifying the effect of the type of analysis on decisionmaking, the game provided novel and highly constructive feedback on the analyses and briefings. Future games following our model could be used to assess how an information product or analysis may be ingested by a decisionmaking body—the recipient of the analysis. In turn, this might suggest how the presentation of a particular analysis or product could be improved to better inform or influence decisionmakers.

Conclusions

The insights of the prototype game were sufficiently promising to justify more exploration. We consider some ways to improve the experimental design and prototype game in the future. These include some refinements to our approach that would allow us to develop more-robust analysis about the role of analysis on force planning decisions. However, perhaps more importantly, we suggest some general best practices for those who might choose to apply this research approach to study other topics. In particular, we see great potential for this type of game series to help shape how research is presented in order to increase its potential to shape stakeholder decisions.

Acknowledgments

We thank the RAND Corporation for supporting this project through RAND Ventures, led by Susan Marquis and Howard Shatz, and nearly 20 of our RAND colleagues for their good-spirited and thoughtful participation in our pilot games. In particular, Michael Spirtas deserves special recognition for helping generate scenario-based analysis for our prototype games, while Abby Schendt and Angelena Bohman provided essential support for the pilot games. We also thank Elaine Simmons, Scott Comes, and Mike Payne, all either presently or formerly of the Office of the Secretary of Defense's Office of Cost Assessment and Program Evaluation, for supporting a prior study that inspired this project. Finally, we thank Paul Steinberg and Sonni Efron for helping improve the clarity of this document and our colleagues Charles Nemfakos and Stacie Pettyjohn for their thoughtful feedback.

Abbreviations

AKP	AK Parti; Justice and Development Party
ANG	Army National Guard
BCT	brigade combat team
CAB	combat action brigade
CAP	combat air patrol
CAPE	Office of Cost Assessment and Program Evaluation
CENTCOM	U.S. Central Command
CONOP	concept of operations
CVN	nuclear-powered aircraft carrier
DMAG	Deputy Secretary of Defense's Management Action Group
DoD	U.S. Department of Defense
DPRK	Democratic People's Republic of Korea
FY	fiscal year
IS	Islamic State
ISI	Inter-Services Intelligence
JCPOA	Joint Comprehensive Plan of Action
JCS	Joint Chiefs of Staff
MEB	Marine expeditionary brigade
NATO	North Atlantic Treaty Organization
NDAA	National Defense Authorization Act
NSC	National Security Council
OCO	overseas contingency operations
OSD	Office of the Secretary of Defense
PB	President's Budget
PLAN	People's Liberation Army Navy
PR	public relations
RC	reserve component
RDM	Robust Decision Making
SATINT	satellite intelligence
TACAIR	tactical air support
USAF	U.S. Air Force
USD	Under Secretary of Defense
USD(ATL)	Under Secretary of Defense for Acquisition, Technology, and Logistics
USD(P)	Under Secretary of Defense for Policy
USD(P&R)	Under Secretary of Defense for Personnel and Readiness
USMC	U.S. Marine Corps

USN	U.S. Navy
WMD	weapon of mass destruction

1. Introduction

The 2014 Quadrennial Defense Review references *uncertainty* nearly 20 times, and the range of potential strategic challenges and commensurate uncertainty has only increased since then. Over several decades—often under U.S. Department of Defense (DoD) sponsorship—the RAND Corporation has developed a portfolio of methods and tools to facilitate force planning under uncertainty. These methods and tools include, but are not limited to, Assumption-Based Planning,[1] Robust Decision Making (RDM),[2] capabilities-based planning,[3] and portfolio analysis.[4] Many studies and pilots have shown the potential value of these methods,[5] but DoD has not yet integrated them into its mainline force planning.

What Is the Value Proposition of Using New Decision Tools?

There are significant challenges to integrating new approaches of decision support into mainline DoD planning processes—challenges that are independent of the virtues of the methods or the feasibility of implementing the tools. Defense decisionmakers, aware that American lives and billions of dollars rest on their decisions, tend to be conservative when deciding whether to adopt new analytical approaches, doing so only when they can be persuaded that new approaches are clearly superior to existing approaches. Adopting a new analysis paradigm, method, or tool can require DoD investment in new processes, organizations, technologies, personnel, and even mindsets about what constitutes best practice. If the end result is the same, it is difficult to justify the costs. In other words, what is the value proposition for using new decision tools? Without the ability to clearly demonstrate the advantages of a new approach in concrete terms, it is understandable that decisionmakers are reluctant to adopt new tools.

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[1] James A. Dewar, Carl H. Builder, William M. Hix, and Morlie H. Levin, *Assumption-Based Planning: A Planning Tool for Very Uncertain Times*, Santa Monica, Calif.: RAND Corporation, MR-114-A, 1993.

[2] RAND Corporation, "Robust Decision Making: Enabling Policymakers to Plan for the Future," multimedia, undated-b.

[3] For examples, see Stuart E. Johnson, Martin C. Libicki, and Gregory F. Treverton, eds., *New Challenges, New Tools for Defense Decisionmaking*, Santa Monica, Calif.: RAND Corporation, MR-1576-RC, 2003; and Paul K. Davis, *Analytic Architecture for Capabilities-Based Planning, Mission-System Analysis, and Transformation*, Santa Monica, Calif.: RAND Corporation, MR-1513-OSD, 2002.

[4] Paul K. Davis, Russell D. Shaver, and Justin Beck, *Portfolio-Analysis Methods for Assessing Capability Options*, Santa Monica: Calif.: RAND Corporation, MG-662-OSD, 2008.

[5] See RAND Corporation, "Robust Decision Making," webpage, undated-a.

Research Objectives and Methodology: A First Step at Determining the Value Proposition of New Decision Tools

Our research attempted to offer an approach to resolving the question of the value proposition. First, we designed a structured comparison game that can be used to assess how analytical inputs to decisionmaking affect the decisionmaking process and the resulting decisions. Second, we ran a prototype or test game to observe how players simulating senior DoD officials reacted to receiving two different types of analytical inputs in their pregame briefing: (1) a traditional, scenario-based analysis and (2) an analysis generated by a more novel method—RDM. The game asked the players to assess trade-offs among alternative military force structures, recommend one of the options, and then characterize the decision in light of an unfavorable future scenario.

The study was designed to assess whether and how differing types of pregame briefing materials—the analytic inputs presented to mock policymakers—changed the DoD decisionmaking process and the resulting decisions. Based on previous RAND research,[6] we hypothesized that the RDM analysis would produce decisions that accounted for a wider range of possible future events. As a result, we expected discussion after the RDM analysis to include more about how likely different scenarios were and which were most concerning. We also expected that, after players saw how their selected alternative fared in a challenging scenario, they would feel less sense of surprise than they did when their decision was informed by traditional analysis. The analytic methodologies (scenario-based versus RDM) and the decision (force structure options) were chosen because RAND already had extensive experience with both from previous projects. This research constitutes a first step toward populating an evidence base on how analytic inputs affect the decisionmaking process and resulting decisions.

Bringing Together a Confluence of Intellectual Communities

This project brought together three intellectual communities: (1) force planners, who conduct analysis and make recommendations about the size and capability of U.S. armed forces; (2) analysts of decisionmaking under deep uncertainty, who seek to support decisionmakers by equipping them with more-explicit and -sophisticated insight into the interplay between decisions and uncertainty; and (3) analytic wargamers, who use simulations with human players to explore decisionmaking.

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[6] See Robert J. Lempert, Steven W. Popper, David G. Groves, Nidhi Kalra, Jordan R. Fischbach, Steven C. Bankes, Benjamin P. Bryant, Myles T. Collins, Klaus Keller, Andrew Hackbarth, Lloyd Dixon, Tom LaTourrette, Robert T. Reville, Jim W. Hall, Christophe Mijere, and David J. McInerney, *Making Good Decisions Without Predictions: Robust Decision Making for Planning Under Deep Uncertainty*, Santa Monica, Calif.: RAND Corporation, RB-9701, 2013.

Traditional Force Planning

At its core, force planning seeks to determine the size and shape of the military that future leaders will need to support their strategic goals. Over time, DoD has used a range of analytical techniques to help inform these decisions. Today, force planning within DoD is a sequence of the following three steps:

1. **DoD force planners specify a set of scenarios or scenario combinations.** Formally, these scenarios are represented by Defense Planning Scenarios and Integrated Security Constructs that the Office of the Under Secretary of Defense (USD) for Policy (USD(P)) develops in coordination with the Office of the Secretary of Defense (OSD)'s Office of Cost Assessment and Program Evaluation (CAPE), the staff supporting the Joint Chiefs of Staff (JCS), and the armed service departments within DoD (e.g., Department of the Navy.) In general, DoD planning scenarios reflect the Presidential Contingency Planning Guidance and the requirements of U.S. defense strategy. The scenarios are posited to take place sometime in the future—often five years out—to better align with the end of the Future Years Defense Program.
2. **Military planners develop baseline concepts of operations (CONOPs)** that the United States and adversaries will use in the scenarios and a database of forces assumed available to execute those CONOPs. This database is represented by a several-hundred-page document that the joint staff develops in coordination with the rest of DoD, including the Office of USD(P), CAPE, the intelligence community, and the service departments. The database reflects DoD's consensus of U.S. and adversary forces and CONOPs in the chosen scenarios and the judgment of military planners whose input is informed by the best available intelligence assessments.
3. **Based on the results from the first two steps, multiple groups within DoD assess potential force packages.** Traditionally, assessments include sufficiency analyses (i.e., quantitative comparisons of the future supply of and demands for forces) and proficiency analysis (i.e., modeling and analysis at the mission and campaign levels). In principle, these assessments are conducted by using the scenarios, forces, and CONOPs developed in the prior steps, subject to whatever changes may be justified in the course of analysis.

This approach emphasizes and prioritizes depth of analysis focused on selected scenarios developed through a linear scenario development and assessment process. Over time, DoD's implementation of this process has come to include more and a greater variety of scenarios.[7] Yet, some have argued that this approach does not work well in situations with many uncertainties and when the uncertainties are not easily characterized by probabilities. Such conditions do not lend themselves to easy (or reliable) parametric analysis.[8]

[7] Zalmay Khalilzad and David Ochmanek, *Strategic Appraisal 1997*, Santa Monica, Calif.: RAND Corporation, MR-826-AF, 1997.

[8] Paul K. Davis, *Capabilities for Joint Analysis in the Department of Defense: Rethinking Support for Strategic Analysis*, Santa Monica, Calif.: RAND Corporation, RR-1469-OSD, 2016.

Decisionmaking Under Deep Uncertainty

Uncertainty is a part of almost all decisions, but decisionmaking under deep uncertainty is different: It refers to a situation in which the unknowns are not easily characterized by probabilities (thus limiting the ability to apply techniques of risk management) or when the analysts do not know (or cannot agree on) the causal relationship between inputs and outputs (thus limiting the ability to use models as predictive tools).[9] *Decisionmaking under deep uncertainty* is an umbrella term for analytic methodologies that provide decision support in conditions of profound ambiguity or uncertainty. The umbrella covers traditional approaches, such as scenario-based planning. But scenario-based planning is not the only technique, or necessarily the best technique, when uncertainties are many, their interactions are complex or unclear, and the relationship between short-term actions and long-term outcomes is difficult to trace.

Modern advances in decision science and in the computing technology available to support modeling and simulation have given rise to a suite of new approaches to decisionmaking under deep uncertainty. RDM is one approach designed to embrace the kinds of uncertainty in force planning. Rather than optimizing outcomes over a best-guess future (or the somewhat more sophisticated but related approach of optimizing over a curated set of several chosen scenarios), RDM searches for policy options that might prove to be "robust" across a wide range of potential futures. That is, instead of requiring prior agreement on assumptions, RDM provides a structured protocol for searching for short-term courses of action that appear most apt for meeting prescribed policy objectives across multiple future states of the world. The robustness standard does not require maximizing achievements (which are always tuned to a particular set of circumstances) but instead seeks to achieve *minimal* criteria for satisfactory outcomes within a set of measures defined by policymakers. This view is in line with Nobel laureate economist Herbert Simon's observation that, contrary to the maximizing behavior postulated in economic theory, businesses will seek to "satisfice" their goals—that is, in the presence of difficult-to-characterize uncertainties, businesses will take courses of action designed to achieve "good" results in several categories of performance across a range of potential future conditions rather than engage in inherently more-brittle optimizing strategies that might well result in disaster when met with a different reality than what had been presupposed. Although RDM has proven

[9] The first discussion in the decision literature of such conditions was in Frank Knight, *Risk, Uncertainty and Profit*, Boston and New York: Riverside Press, 1921. The Society for Decision Making Under Deep Uncertainty is the professional society of theorists, tool creators, and practitioners dedicated to the topic (see Society for Decision Making Under Deep Uncertainty, homepage, undated). Added to the objective problems posed by deep uncertainty in its technical dimensions, there is also the normative issue of how to get stakeholders to agree on priorities and weightings for characterizing multi-attribute outcomes as good or bad.

valuable to policymakers in a range of settings,[10] there have been few systematic studies of how using RDM changes the process and outcomes of decisionmaking.[11]

Wargaming

Finally, we use *wargaming*—simulations in which humans make decisions in contested environments and then experience the outcomes of those choices—to generate evidence about the effect of information on decisionmaking. Wargaming has a long history as a military decision aid and experienced a renaissance under former Deputy Secretary of Defense Robert Work.[12] Nevertheless, wargaming has not received the same theoretical attention as operations research modeling and simulation have. Thus, there is little agreement, even among expert practitioners, about what types of evidence games can provide. While most wargamers agree that games can be helpful in exploring issues and generating hypotheses, many are uncomfortable with using games to test hypotheses, given the artificial environment and small number of iterations. Despite these concerns, wargame results are often used to support arguments about the comparative benefits of different decisions. Given that games are often applied in this way, we sought to design a game that explicitly embraces practices from structured comparison research design, in the hopes that it would allow us to make clearer, more-defensible claims.[13]

The objective of this study is to assess the influence of analytic inputs on the process and outcomes of decisionmaking under deep uncertainty. We employ the tools of wargaming by developing a design based on structured comparison to examine how decision analyses supplied to policymakers affect the decisionmaking process and resulting decisions. In so doing, we also assess the broader utility of structured comparison games and the information and conclusions that such games provide.

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[10] See RAND Corporation, undated-a.

[11] An exception is Robert J. Lempert, Drake Warren, Ryan Henry, Robert Warren Button, Jonathan Klenk, and Katheryn Giglio, *Defense Resource Planning Under Uncertainty: An Application of Robust Decision Making to Munitions Mix Planning*, Santa Monica, Calif.: RAND Corporation, RR-1112-OSD, 2016.

[12] See Robert Work, "Wargaming and Innovation," memorandum to various defense leaders, February 9, 2015. The modern wargame traces its lineage back to the *kriegspiel* game played by Prussian staff officers in 1821 and has seen regular use in DoD since the late 19th century. RAND began using wargames in 1947.

[13] We have opted to use the term *structured comparison* from the case study literature because it captures the desire for a close comparison with a recognition that there are many variables that are not under the control of the game designer—and thus must be accounted for in analysis. Some members of the gaming community have also used the term *quasi-experimental* to describe this type of design. (For a snapshot of this debate, see Margaret Polski, "Are War Games Quasi-Experiments?" Military Operations Research Society 84th Symposium, WG 30 Special Session, June 24, 2015; and Elizabeth M. Bartels, "MORS 83th Panel AAR: Typologies of Game Standards," *PAXsims*, July 7, 2015.) We believe the term as defined in Shadish, Cook, and Campbell (2001) to be useful in that it places emphasis on the game designers' ability to manipulate many variables—notably, the treatment of interest—as part of the game design process while emphasizing that the absence of random assignment creates a need to think carefully about alternative explanations before making causal claims (see William Shadish, Thomas Cook, and Donald Campbell, *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*, Boston, Mass.: Houghton Mifflin, 2001). However, because *quasi-experiment* is not used consistently across deferent research communities, we found that it created unhelpful methodological confusion and have thus opted not to use it.

Organization of This Report

In Chapter 2, we present a structured comparison game designed to assess how two different analytic approaches affect the decisionmaking process and resulting decisions. In Chapter 3, we discuss our approach to analyzing the game, the insights from the analysis, and some conclusions; we then chart some directions for future work to improve on our approach.

2. A Game Design for Examining the Effect of Information on Decisionmaking and the Game's Application to a Force Structure Problem

In this chapter, we present the design of a structured comparison game intended to provide information on how analysis affects the decisionmaking process and resulting decisions. We differentiate between the fundamentals of our game design, which we believe to be broadly applicable, and the particular features of our prototype of that design, some of which were specific to the policy problem (force planning) and types of analysis (scenario-based versus RDM) that we opted to use for this initial game.

Overview of the Fundamental Design of the Game

Our game simulates an executive decisionmaking body convening to make a major decision. Participants play the roles of major stakeholders who normally participate in such a meeting, while the chief executive is represented by a member of the control team, whose job is to draw out participant views and adjudicate arguments among them.

Each round of the game consists of two moves. First, participants are exposed to analysis about a specific policy problem using means (briefing, written report, etc.) consistent with the normal business practices of the decisionmaking body. Participants are then asked to make a collective decision with long-term consequences based on the information provided to them. The process of discussing the collective decision should mirror that of an actual executive organization as much as practicable.

After the participants arrive at a decision, the control team selects a single future scenario that creates a consistently stressful situation across rounds of the game. In a second move, participants are then forced to grapple with the consequences of their initial decision under the selected future. They are prompted to describe how they might respond to the revealed scenario's exigencies in light of their prior decision. They are also prompted to discuss any "regret"—that is, their impression of what better decision could have been made.

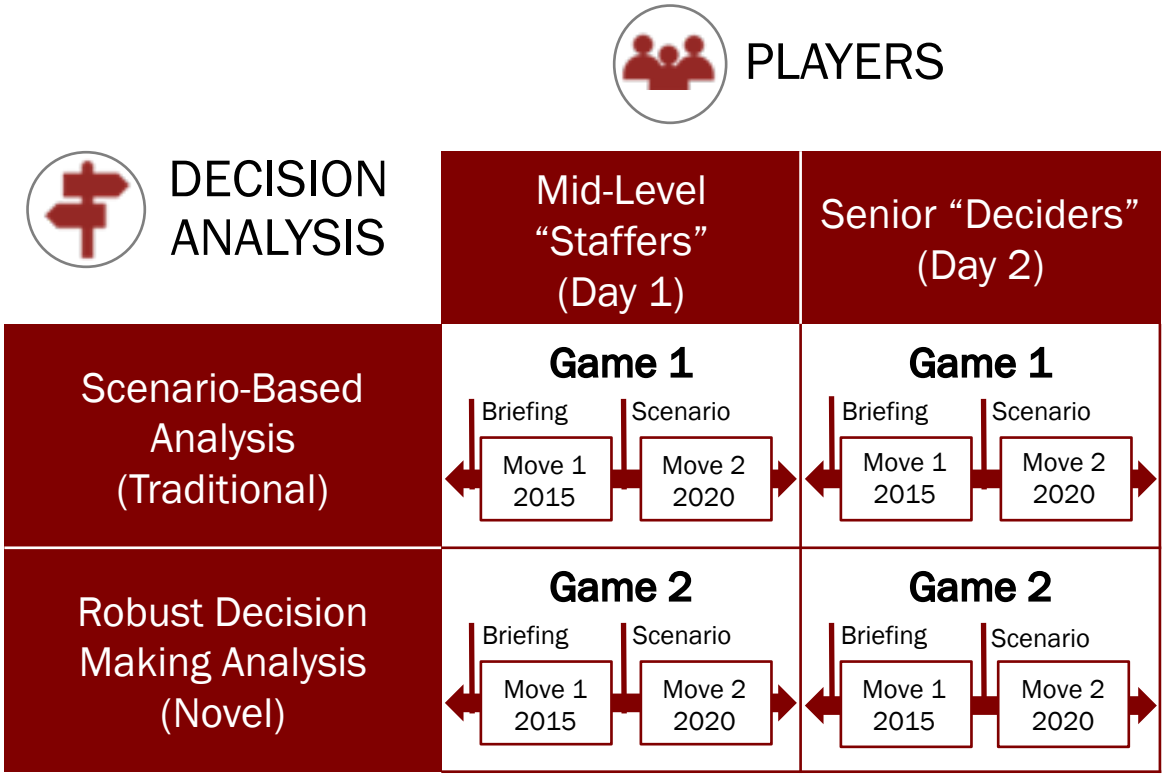
This process is repeated at least twice, generating multiple decisionmaking processes and resulting decisions. These repetitions should follow the logic of a structured comparison design—that is, one repetition should feature analysis that represents the status quo conditions to serve as a control, while other repetitions feature novel analysis as an experimental condition. To the extent possible, differences other than the analytical input should be minimized.

Analysts can then describe the differences in the decisionmaking process and resulting decisions between the rounds of the game and characterize what differences seem to be related to the differing analyses and which to other factors that might not be held constant between games, such as the players.

Overview of Our Prototype Game

We built a prototype game to see how this design works in practice and to explore the impact of analysis on force planning decisions. As shown in Figure 1, we conducted four games in total. Two games were conducted on Day 1, using players who had served in staff roles within DoD, and two games were conducted on Day 2, with players who had served in senior DoD leadership roles. In game play, both groups were asked to role-play the same group of senior defense leaders. In Game 1 on each day, players were given a traditional scenario-based analysis, drawn from past RAND work on the 2015 planned force structure. In Game 2, they were given a briefing on prior RAND work applying RDM to a similar force structure decision analysis.

Figure 1. Game Format

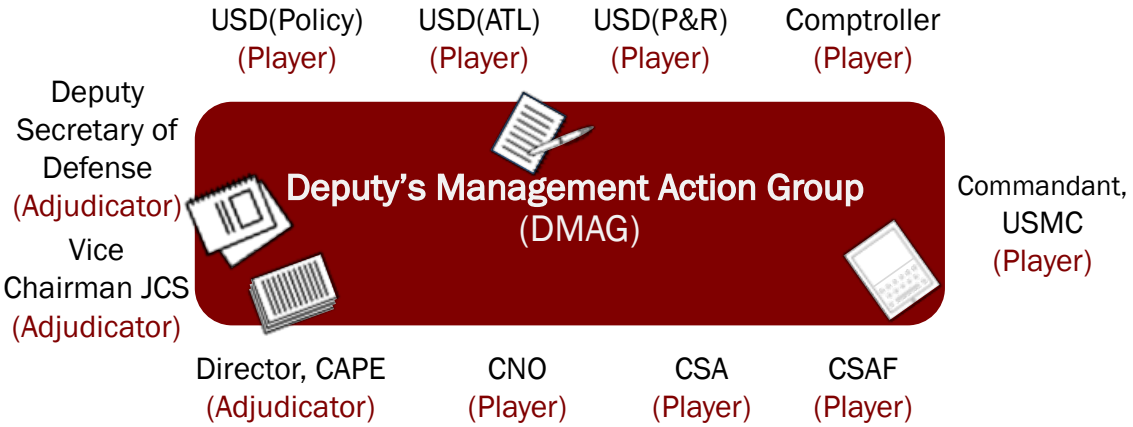


In Move 1 of each game, we simulated a meeting of the Deputy's Management Action Group (DMAG),[14] a forum chaired by the Deputy Secretary of Defense that convenes the Vice Chairman of the JCS (co-chair), each of the services' secretaries and chiefs (whose roles were generally combined for the purposes of game play), and several major offices within OSD—including CAPE; the Office of USD(P); the Office of USD for Acquisition, Technology, and

[14] For a description of a DMAG, see Appendix A, which was provided to players in our pilot games as preparatory reading.

Logistics (USD(ATL));[15] the Office of USD for Personnel and Readiness (USD(P&R)); and the Office of USD(Comptroller).[16] Figure 2 presents a summary of roles simulated in our prototype. We recruited two groups of players, one with staff-level experience only and one with senior leader experience, which gave those players more familiarity with the decisionmaking forum. To examine whether differences in player experience were a potential confounding factor, we separated these players into two groups to allow comparison between them.

Figure 2. Game Roles



NOTE: CNO = Chief of Naval Operations; CSA = Chief of Staff of the Army; CSAF = Chief of Staff of the Air Force; USMC = U.S. Marine Corps.

In all four games, the first move shared the same scenario, or narrative of events leading to the decision. The games were set in an alternative recent past in which the DMAG is tasked with choosing among three broad options for cutting force structure to pay for modernization, as summarized in Figure 3.[17] Prior to the start of discussion, the players were given a 15-minute oral briefing and were provided with printouts of the slides as a reference. While the world described in the briefings was consistent across all games, the way that the information was analyzed differed between Games 1 and 2. Based on the presented analysis, players were asked to recommend which force structure option they preferred and defend the recommendation. At the end of the move, the simulated Deputy Secretary of Defense announced his decision, based on the recommendation of the group.

[15] Since our game was run in 2017, this office was replaced with two organizations: the Offices of USD for Acquisition and Sustainment and USD for Research and Engineering.

[16] For a description of each role's position on the force structure decision, see Appendix B, which was provided to players in our pilot games as preparatory reading.

[17] For a description of the decision to be made and the three force structure options, see Appendix C, which was provided to players in our pilot games as preparatory reading. Players were permitted to collectively modify these three options, if they wished.

Figure 3. Fictional Force Structure Options

BASELINE	ALTERNATIVE 1	ALTERNATIVE 2
Planned force structure from the 2015 Future Years Defense Program	$40 billion in cuts applied evenly to the services' force structure	$40 billion in cuts protecting Navy and Air Force structure
+$20 billion to the modernization account	**+$60 billion to the modernization account**	**+$60 billion to the modernization account**

After the first move, players were presented with a scenario set five years in the future. Scenarios were tailored to the decisions made by participants, so participants were faced with a future in which their selected force structure was worse than other options that had been considered; in other words, the participants were put in a position in which they had made the wrong decision.[18] This was done to ensure that participants faced comparable situations across different games. Because our primary research interest was in the players' experience of regret, it seemed more important to hold the experience of regret constant, which required shifting the scenario based on the decision.[19] Because our primary goal was to present an unexpected, stressing scenario, we did not aim to develop scenarios that we felt were predictive, or necessarily plausible, but rather ones that would be thought-provoking to players. Because the tenure of the most-senior government decisionmakers rarely extends to five years, the players were presumed to no longer be in their former roles and reconvene to reflect on their prior decisions under the auspices of an independent commission on DoD force planning sponsored by the Deputy Secretary of Defense. Players were asked to discuss how they might have made a better decision in the first move.

After a short break, players then played Game 2, which followed the same process but with a different briefing before Move 1 and a different, but equally unfavorable, scenario before Move 2. The goal was to create two comparable games that differed primarily in the analysis that was provided as an input.

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[18] See Appendix D for the text of the four scenarios, one of which was provided to the players during each game, based on the control team's assessment of which scenario would be most stressing. Scenarios were not repeated within a group.

[19] To generate consistent scenarios, we used previous RDM analysis to identify the structural features of scenarios that would be stressful to each of the three proposed forces. We then generated two narratives around each set of factors to prevent the players from becoming bored and disengaging from the game. The introduction of superficial difference in the scenario does introduce a potential confounding element; however, player discussion across games in which they made the same choices did not reveal strong differences in response as a result of these factors.

Next, we elaborate on this prototype design by enumerating and describing the key experimental and other variables.

Experimental Variable: Analytical Inputs to Decisionmaking

The game format is designed to allow analysts to compare decisions made with different information. In the framework of structured comparison, the experimental variable is thus the information provided to the decision body. Almost any criteria could distinguish the information provided under experimental and control conditions (e.g., the PowerPoint color palette). What we were primarily interested in was differentiating the effect that information from applying different analytic frameworks, methods, or tools had on decisionmaking.

In our prototype game, participants received one of two types of briefings to inform their initial force structure decision. In the control condition, participants received information based on the analysis of competing force structures using traditional, scenario-based force sufficiency and proficiency analyses. This approach emphasizes deep campaign analysis of relatively few scenarios and assumptions. In the experimental condition, participants received information based on an RDM analysis of the same force structures. This analysis assessed force sufficiency across a wide range of scenarios, including both a much wider range of potential conflicts and scenarios with small or no conflicts, but it presented no detailed mission or campaign analyses.[20]

In the prototype game design, we worked to standardize how much information was provided in each condition. In the control condition, participants were briefed orally on force sufficiency and proficiency in two scenarios; in the experimental condition, they received information about sufficiency over a vast number of scenarios.[21] But both briefings had approximately the same number of slides and were allotted the same amount of time for formal hearing. Players were not provided copies of the briefings beforehand, out of concern that doing so would make it difficult to isolate the impact of each set of analysis in turn.

Funding constraints for this exploratory effort precluded us from developing custom sufficiency or proficiency analysis, so we had to harvest prior work to develop the briefings that represented the experimental and control conditions. All prior work happens to be classified, so we are unable to discuss it in detail here. However, broadly speaking, the scenario-based analysis included sufficiency analysis of three force structures in two scenarios, as well as a campaign analysis of those same scenarios. The overarching conclusion was that the campaign analysis did not discriminate the force structures; the more striking shortfalls were in capability (i.e., modernization) and posture, not capacity. The RDM analysis included sufficiency analysis of the same three force structures but in approximately 90,000 scenarios consisting of different assumptions on the demands for and supply of forces. The overarching conclusion of the RDM analysis was that several (classified) classes of scenarios discriminated the risks posed by the

[20] Both briefings drew from prior RAND work. Those studies are classified, so their materials are not presented here.

[21] These many scenarios, in turn, were based on a database of millions of case simulations.

three force structures; however, because the RDM analysis did not include any proficiency analysis, no insight was provided about modernization or posture.

Other Variables: Actors, Decision Context, and Rules of Game Play

The game is intended to be run multiple times, and participants are asked to make the same decision under two or more different information environments. As with any structured comparison design, ensuring that the games were comparable required special effort to hold factors other than the experimental variable—analytical inputs to decisionmaking—constant. Where it was not possible to do so, we note the differences and consider the potential effects of those differences during analysis. We explicitly acknowledge three specific variables in our design: actors, the decision context, and the rules of game play.

Actors

The game's key actors are the stakeholders of the executive forum, each of whom has potentially diverging goals, preferred courses of action, information, and abilities to influence the debate. The game does not set players in direct opposition, but the diverging equities and preferences do create opportunities for conflict and negotiation. Thus, the game requires players that can reasonably represent the perspectives, biases, and capabilities of the decisionmakers they are asked to simulate.

Our criteria for choosing such players specified that players should have

1. experience with the executive forum under simulation
2. expertise in the specific issues underlying the decision
3. sufficient experience with, or understanding of, the knowledge, equities, preferences, and biases of the individual stakeholders whom they have been charged with simulating.

These three criteria may be difficult to satisfy, and players will always be a source of external variation outside the control of the game designer. For example, logistical constraints, such as cost and availability of invitees, could limit the pool of available recruits, and personality and interpersonal dynamics are not subject to experimental controls. To mitigate shortcomings in the key actors, preparatory materials may be developed and shared to provide players with a common understanding of key assumptions and contextual information, as well as their roles and positions in the deliberations.

Given the game's focus on the effect of different types of analytic input on the decisionmaking process and resulting decisions, we were particularly concerned about external information that players bring into the game based on prior experience. This is not necessarily problematic; in fact, it can be representative, given that real-world decisionmakers bring prior information to a decision. But given our analytic objectives of understanding the impact of information on the decisionmaking process and resulting decisions, care must be taken to note what information influences decisionmaking—information presented as part of the experimental or control condition or external information introduced by the players.

In our prototype game, simulation of the DMAG required members of the control team and players to represent key positions.[22] The Deputy Secretary of Defense was played by a member of the control team, who acted as the primary facilitator for the discussion, with an assistant facilitator playing the Vice Chairman of the JCS. Another control team member acted as director of CAPE and presented the information briefings to ensure consistency. Players represented the USD(P), USD(Comptroller), USD(P&R), and USD(ATL), as well as the service secretaries and chiefs.[23]

Players were recruited based on their past professional experience. All had substantive experience working near, if not actually in, the organizations they were representing. Thus, players had an understanding of the culture, long-term interests, and priorities of their organizations. However, because they served in government during different periods, there was concern that these differences might affect the policy positions players advocated within the game. To mitigate this concern, the research team provided consistent written guidance to each player in advance of the game (reproduced in Appendix B). This information was not designed to tie the hands of the players in negotiation but instead to provide a consistent starting point for debate and deliberation.

In our prototype game, players were recruited from the RAND analyst community; it was desirable but not feasible to recruit former DoD officials from outside RAND. This limited the size of our pool of potential players and introduced a bias in that all players were seasoned analysts. Recruiting seasoned analysts as decisionmakers could introduce a bias for or against different forms of analysis (i.e., RAND analysts were not agnostic about the way analysis should be conducted or presented). In particular, we were concerned that players with the most relevant experience would also be those most likely to be aware of the prior RAND research that generated content for the experimental and control conditions. Again, bias is not necessarily problematic, because real-world decisionmakers also come with biases. Nonetheless, we endeavored to detect any evidence of bias to permit a fair assessment of the effect of information on the decisionmaking process and resulting decisions.

The small size of the potential player pool imposed a practical limit on the number of players available. We asked the same individuals to play the same role in experimental and control conditions of the game to make the most out of the available pool. We believed that the degree of learning by participants between the two rounds would be a less serious threat to comparison than would attempting to establish the comparability of two entirely different groups, given the limited, heterogeneous population of players available to us. However, this does not remove the concern that players learn between iterations of the game and thus, in some (potentially key) ways, are not the same between the two iterations.

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[22] See Appendix A for an enumeration of the participants in a typical DMAG.

[23] In our prototype game, the roles of service secretaries and chiefs were consolidated so that there was one representative for each service. This choice was made in order to limit the number of players while still allowing players to bring both political and military arguments to bear. However, some of the more senior participants found this construction confusing and recommended that only the service secretaries be used in future iterations.

We also opted to run two iterations of the game—one with players who had served in senior DoD leadership roles and another with those who had served in staff but not leadership roles. Segmenting players in this way allowed us to hold experience relatively constant within each game and allowed us to gain some insight into the effect of experience on the decisionmaking process and resulting decisions.

Decision Context

Another variable in the game design is the decision context surrounding the Move 1 decision: What is motivating the decision, and what else is happening in the world that should, in principle, affect decisionmakers' assumptions, equities, or preferences? If the decision is situated in the present, the decision context could be evident to players familiar with current events. But if the decision is situated in the past or the future, a more full-fleshed narrative (often referred to as a scenario) may be advisable. The decision context will always affect decisionmaking by framing the problem and viable decision choices. Thus, the game requires a common understanding of the major political, military, economic, and social assumptions of the decision context.

There is also a context around the second move, necessarily situated in the future. This has two parts. The first is a narrative explaining why the decisionmakers have gathered in the aftermath of their Move 1 decision, because the goal of Move 2 is retrospective evaluation of players' decisions in Move 1. The second and more challenging requirement is to elucidate how the world has evolved since Move 1. This is analytically important for the structured comparison design and presents several design options. The research team could develop a single future that would occur in all games regardless of the decision made during Move 1. Alternatively, different possible futures could be paired with each possible decision option. (For example, the future could be designed to challenge the chosen option.) Finally, the research team could construct a set of possible futures and then draw one randomly at the start of Move 2.

Our prototype revisited a DoD decision from 2015—how best to cut force structure to accommodate a new budgetary environment. In part, revisiting a prior (rather than current) decision was driven by the need to build on existing analyses; resources were not available to conduct new force structure analyses. However, rather than simply replaying history, we opted to situate the 2015 decision in a different budgetary scenario, this time requiring DoD to cut force structure to pay for modernization. Had we used historical events in which cutting force structure was a way to absorb reductions in budget, players would have likely replayed former debates without much added depth or opportunity for debate to influence perspectives. We hoped that setting up similar choices within a different context would provoke more-thoughtful debate. As we discuss later, players experienced some dissonance in reconciling the counterfactual context with their past and current knowledge.[24]

[24] For an elaboration of the decision context used in our prototype, see Appendix C, which was provided to players in advance of the game.

To craft a context for Move 2, we portrayed the future Secretary of Defense as being dissatisfied with the force structure available to her in 2020 and charging her Deputy Secretary of Defense to reconvene the 2015 players to revisit their decisions and make recommendations on how to improve DoD force planning processes. We wanted to ensure that, regardless of which challenge scenario was selected for Move 2, participants faced a stressful future that prompted a broadly similar experience of regret. "Regretful" scenarios were based on the original RDM analysis to identify the characteristics of a stressing scenario for each decision option that we presented. This identified scenario elements that, in one case, would be common between selecting the baseline case and choosing to cut forces evenly across services and that, in another case, would stress the option of preserving naval and air forces. Because each group of participants would decide twice, once in each game, we developed two scenarios for each possible decision to prevent redundant conversation if the same option was selected during each Move 1.[25] For added drama, we created an illusion that the future was randomly selected by asking players to roll a die to determine the future.[26]

Rules of Game Play

Because this game is designed to represent the decisionmaking process of an executive body, the rules and structure of the game must be designed to constrain or incentivize participants to follow the procedures and norms that govern the executive body being simulated. There is less need in the second move to mirror the real-world process, so the rules could instead be designed to promote a rich discussion about the benefits and costs of the decision that was made, given the future that emerged.

For our prototype game, we sought to mirror the procedures of the DMAG, in spirit if not in precise form, to encourage more-committed role play. First, a control team member representing CAPE briefed the analysis orally, provided hard copies, and answered any participant questions. During Move 1, the control team Deputy Secretary of Defense facilitated discussion. The session began and ended with a round robin in which each stakeholder had an opportunity to state his or her positions and reasoning. The facilitator moderated debate between the different stakeholders in the intervening discussion with the goal of ensuring that all players articulated their arguments and positions. Although facilitation was not modeled on the style of any particular Deputy Secretary of Defense, it was designed to mirror common concerns and management techniques observed among several incumbents. However, because the game sought to understand the effect of information on the decisionmaking process and resulting decisions, the facilitator also paid particular attention to eliciting what information players used to support their positions (which would likely be a lesser priority in an actual DMAG session). At the end of Move 1, the Deputy Secretary of Defense made a unilateral decision (thus mirroring the actual DMAG process);

[25] Because the baseline and alternative 1 force structures shared a similar risk profile, we found that those two decisions could use the same stressing scenario.

[26] See Appendix D for a description of the four Move 2 scenarios.

however, rather than deciding based on his own judgment after hearing the discussion, in our game, he made a decision that he judged most likely to maintain player buy-in (for example, by mirroring group consensus).

By design, the second move had a lesser requirement for realism. The rules guiding discussion were designed more explicitly to elicit insights rather than to simulate the real-world process. In particular, we designed a discussion in which different stakeholders would articulate their senses of regret. We wanted players to describe the shortcomings of the force structure that they had selected and assess whether a different decision or process might have led to a better outcome.

3. Analysis and Observations

In this chapter, we discuss how we did our analysis and what observations emerged from the analysis. Note that we overload the word *analysis* by using it to refer both to our experimental variable and to the activities we undertook in this research to assess the effect of the experimental variable on the decisionmaking process and resulting decisions. We trust that the reader can discern the intended meaning from context.

Our Approach to Game Analysis

Our chief analytical goal in comparing the results of the two games required describing the difference in the decisionmaking process and resulting decisions and ascribing explanations for the differences. We focused on qualitative measures of discussion content, argumentation style, and social dynamics, as well as expert observation of the flow of game discussion. Observation, which is most typical in the wargaming community, consisted of research team members observing game discussions and drawing conclusions from postgame reflections. These insights were informed by previous quantitative analysis of sufficiency and proficiency of each of the force structures produced as part of the original scenario-based and RDM analysis. This approach benefits from the diverse experiences of the team members but is not very transparent because it relies exclusively on observers' impressions, which are subject to individual biases that are not shared between observers and which are difficult to communicate to the consumer of analysis. For thematic analysis, a single team member (1) coded each statement made by participants as recorded in a consolidated partial transcript that was compiled from three sets of notes and then (2) compared the counts of each code across different games.[27] The results complemented the purely observational mode. Given the complexity of the data generated by such games, the small number of cases, and the need to identify potential confounding factors, using multiple, independent approaches increased our confidence in the observations derived from a limited demonstration.

Key Observations

The research team came to the game with two key questions of interest:

1. Did teams make different decisions when presented with scenario-based versus RDM analysis? How did the decisionmaking process and the resulting decision differ?
2. Did differences in player experience impact decisionmaking processes or the resulting decision? In other words, is player experience an important confounding variable?

[27] The use of both a partial transcript and a single coder was imposed by the small scale of the project. Best practices are to use multiple coders and a full transcript to limit the impact of coder bias.

Our analysis showed some difference in the decisionmaking process but did not offer much evidence of difference in the resulting decision stemming from the type of analysis provided. However, we also found large differences in both process and resulting decision connected to player experience, supporting our concern that this is indeed a critical confounding variable.

In addition to these findings, the research team also had a realization during the games: The type of information we gained in the game would have been of great value to the original study team as a complement to the traditional quality control process.

Type of Analysis Appeared to Affect the Decisionmaking Process

Research team observations of game play suggested that the type of decision analysis affected the course and content of debate among decisionmakers. In the game prompted by scenario-based analysis, players spent considerable time debating the validity of underlying assumptions, arguing that the assumed demands for, and supply of, forces were optimistic and, as a result, that shortfalls were larger than presented. In particular, many players argued that the readiness assumptions were unrealistic, masking shortfalls. In contrast, in the game informed by RDM analysis, players debated the likelihood of different scenarios, the importance of the different scenarios, and the implied risk of the options. These results aligned with our initial hypothesis that RDM would change the debate.

Our thematic analysis confirmed these observations but also suggested that the effects may have been weaker than observers perceived. Based on multiple readings of the partial transcript, we identified 14 *codes* (or reoccurring themes) in the discussion across Move 1 and counted how many times each theme occurred in all four games.[28] These count data suggest that, although many of the differences in the conversation noted by analysis are supported by differences in count statistics, in some cases, the difference is small. For example, there was indeed more discussion of scenarios and assumptions in the scenario-based games than in the RDM games, for both groups of participants. However, discussion about force supply assumptions was different only for the senior players: Mid-level player discussion produced about the same number of talking points between the traditional- and RDM-informed games. Similarly, although both scenario likelihood and criteria were discussed more in the RDM game than in the scenario-based one, the differences did not appear in the senior leader game. On the whole, the thematic analysis supported the conclusions of the observational analysis, but the effects were weaker than suggested by observational analysis alone.

The notable exception to general support between observational inference and qualitative coding of transcripts was the discussion of the relative impact of particular assumptions. While this is an area where the research team detected a difference between the scenario-based and RDM games, that difference did not appear prominently in the partial transcripts at all and thus was not one of the 14 codes. Several possible explanations for this gap exist. The first is that direct observation of the conversation picked up on details neglected in the written record—for

[28] Appendix E provides the full list of codes and frequency counts.

example, by picking up on patterns of word choice that were not accurately captured in notes. Alternatively, the coder may have created codes that included the concept of importance as a subelement but did not find enough evidence to measure it. Finally, the expert observer may have been struck by a minor point of the discussion because it fit with his or her preconception of what would happen. While not sufficient to negate the other evidence, this finding suggests that some caution is warranted.

Observational inference also suggested that the type of analysis had weak effects on player deliberations in Move 2. After scenario-based analysis, mid-level players debated the magnitude of threat posed by the revealed future, accepting that they may have made the suboptimal choice but disagreeing about how much it mattered. In contrast, after the RDM analysis, mid-level players' Move 2 focus was far more on whether their deliberations had put enough weight on the particular case. Put differently, it seemed that, under scenario-based analysis, the stressful scenario was one that participants had not fully considered, while, under RDM analysis, they had considered it but simply bet wrong. Notably, this effect was not observed in the games with more-senior players, because they found the RDM analysis less intuitive and thus spent more time discussing the approach than the scenario results. Because of the shorter and more diverse nature of discussion during Move 2, thematic analysis was not insightful.

At one level, these findings present a potentially obvious point that decisionmakers will react to the material presented to them. This represents both an opportunity and a risk. But there is also some support for our initial hypothesis that RDM analysis would provoke more consideration about different scenarios and how much they should be factored into players' decisions.

Type of Analysis Has a Weak Effect on Resulting Decisions

The form of analysis—scenario-based versus RDM—also had some effect on resulting decisions, but the effect was not strong. In the game featuring mid-level staffers, players made different decisions on the basis of the analysis. However, in the game informed by RDM analysis, there was not a clear consensus at the end of Move 1, so the control team had to reconcile disagreement to culminate the move. While some players accepted the control team's reconciliation, some seemed somewhat surprised. In the game played by more-senior players, participants made the same decision in both cases—to default to the baseline option, failing to free up much desired funds for modernization. Moreover, a couple of players were reluctant to make any recommendation in the second game because of a desire to make modernization decisions first. As a result, the games did not provide strong evidence that different analysis types change the decision that was made by participants.

Several factors about the setup of our game may explain the small difference between the resulting decisions in the two conditions—without negating the hypothesis that different analysis would lead to different decisions. One is that the analysis presented through the different approaches did not suggest that radically different decisions should be made. This is somewhat supported by the research team's belief that both briefings suggested somewhat similar courses of action. Alternatively, the presentation of novel analysis may have been sufficiently confusing

that it was not persuasive. There was some evidence in favor of this supposition based on the senior group of players who struggled to interpret several key points in the RDM analysis. Relatedly, player frustration about the nature of the decision they were asked to make may have played a role in their decision. Both groups exhibited more interest in a conversation on modernization, and players in the senior group in particular stressed that they felt they were tackling the decisions in the wrong order. Add in confusion over the counterfactual historical setting, and players may have made artificial decisions. All these potential explanations point to the need for refinements in the methodology to resolve these issues in the future.

Player Experience Seemed to Have an Even Larger Effect on the Decisionmaking Process and Resulting Decisions

Player experience appeared to have a larger effect on the decisionmaking process and resulting decisions than did the type of analysis presented to the players. Both the content of the debate and the decision differed between mid-level and senior groups in both experimental and control conditions. Even more striking is the difference in the flow of discussion between the two groups. Although there were some differences between information conditions—for example, the discussion of trade-offs between force structure and modernization decreased between the scenario-based and RDM game for both mid-level and senior players—far more striking were the differences between the two groups of players: We tracked substantial differences across codes representing more than one-half of the total coded comments.

Beyond the difference revealed in the coding, there were several obvious ways that the two groups' discussions differed, based on the observational analysis. The research team observed that senior players were more skeptical of RDM analysis and, in general, favored a traditional, scenario-based approach. This skepticism may explain why these players were not motivated to recommend a different option. Senior players also exhibited more dissonance with our counterfactual decision context, expressing concern that there was not more focus on modernization and on a resurgent Russia. These findings confirm some of the limitations with our prototype that we discuss later in this chapter.

Player Experience Seemed to Affect the Realism of the Simulation

Observational analysis also suggested that player experience affected the realism of the debate, even more specifically than the content of the debate. The most-experienced players acting as service chiefs expressed strong service interests and a general resistance to giving up force structure, even when it prevented the group from reaching its goal of freeing up money for the modernization that all agreed was crucial. The most-senior players also exhibited some (polite) dominance over the less senior players, holding the line even when opportunities for negotiation emerged. Research team members with direct DMAG meeting experience observed that this parochial behavior mimicked actual bureaucratic debates.

Game designers have long debated the relative importance of player experience in the usefulness of game play.[29] Our experience offers further evidence that written role instructions can go only so far in helping players mimic true organizational behavior for which there may be no real substitute other than personal experience.

Game Design May Help Improve the Utility of Analysis for Decisionmakers

Independent of the value of the game for identifying the effect of the type of analysis on decisionmaking, the game provided novel and highly constructive feedback on the analyses and briefings. By putting players in the mode of decisionmakers with competing interests, the game yielded insights both about the quality of the force structure analysis and about how those force structure analyses might influence debate and the decisionmaking processes and resulting decisions. In fact, the feedback was so useful that several team members commented that it would have been useful to have had the feedback during the original RDM analysis and discussions. This gave rise to the idea that games of this design could be used to help research teams hone the communication of analytical approaches and important findings to decisionmakers.

The game could be used to (1) assess how an information product or analysis may be ingested by a decisionmaking body—the recipient of the analysis—and, in turn, (2) suggest ways to increase the chance that an analysis or product (and its presentation) will effectively inform or influence decisionmakers. Role-play provides far more consideration of factors that influence how analysis is received, including institutional equities, personalities, and differing incentives. By enabling research teams to both observe the difference in decisionmaking processes informed by alternative analysis and ask direct questions of decisionmakers to explicate the rationale behind their choices, the game provides information that may not be apparent from sponsor interviews and other traditional engagements. Games of this type represent an unusual and valuable perspective on how decisionmakers may opt to employ new tools and analysis.

In considering whether to conduct a game, it is important to consider whether the potential value of this perspective is worth the cost. Games require substantial investment in personal time. As this game's findings demonstrated, more-senior players are better able to mimic relevant bureaucratic behavior, which is particularly important for this application of the game format. Given the greater expense and difficulty associated with securing senior participation, this approach is likely to be most important for major analytical efforts, for which the potential benefits of adopting analysis and resulting recommendations meaningfully outweigh the added cost of the game.

[29] For a canonical example of both sides of this debate, see Robert A. Levine, Thomas C. Schelling, and William M. Jones, *Crisis Games 27 Years Later: Plus C'est Déjà Vu*, Santa Monica, Calif.: RAND Corporation, P-7719, 1991.

4. Conclusions and Future Directions to Improve the Structured Comparison Design and Our Prototype Force Planning Game

For this study, our ingoing focus was on whether there is a value proposition for policymakers that justifies the time and expense of using a new approach to decisionmaking. The results of the prototype game were sufficiently promising to justify more exploration. Narrowly, we received invaluable insights about what does and does not work about one presentation of RDM analysis to senior DoD audiences that may help shape the presentation of future RAND work. More broadly, we gathered evidence that a structured comparison game design can provide some evidence that differing forms of analysis can affect the decisionmaking process and resulting decisions, although, given a small number of repetitions of the game, that evidence will be somewhat weak. Also, we found that the level of player experience seemed to have larger effects on the decisionmaking process and resulting decisions and to increase simulation realism. Finally, we determined that our game design may have an unexpected application for improving the presentation, and thus utility, of analysis to decisionmakers.

Although our structured comparison design and prototype game yielded some preliminary evidence that differing forms of analysis can affect the decisionmaking process and resulting decisions, the effort was always more of a proof-of-concept than an attempt to be the last word on the matter. Given what we learned, what could be done to improve future efforts that expand on this effort?

Any structured comparison design is limited in how much control or even measurement the designers have over variables that might be expected to affect the decisionmaking processes and resulting decisions. These variables may affect the ability to isolate the influence of the provided information. The only recourse is to properly account for alternative explanations when drawing conclusions and discuss how they may confound results and explanations.

In the remainder of this chapter, we discuss ways to improve our specific structured comparison game design and our prototype game.

Improving Our Structured Comparison Game Design

The premise of the game design is that the effects of information from different analytical approaches will manifest in the decisionmaking process and resulting decision. However, if a bureaucracy, such as DoD, were to embrace a new analytical paradigm, broader changes across the organizations could create effects that may dominate the ultimate effect on the decision body. For example, if RDM were adopted, governance bodies would be set up to identify and parameterize uncertainties rather than choose scenarios or adjudicate assumptions; studies would be chartered to explore and then identify scenarios for deeper investigations. Our game affords no insights into how alternative analytic methods, tools, or paradigms could create ripple effects throughout the DoD force planning establishment—or what those effects might be. Our game

focuses solely on the final decisionmaking process and resulting decision. In principle, future work could examine the effect of a new approach to decision analysis on elements of DoD force planning, such as scenario selection and CONOP development, staffing during baseline assessments, and staffing in the lead-up to a major decision meeting.

Additionally, this game system assumes that differences in analysis are visible in the presentation of results, which is not always the case. Generally, senior leaders receive very limited information about methodology, so not all types of novel analysis will produce such variation. This game format will be helpful only if the new and traditional analysis types produce information that is different in character. This is typical of new approaches that attempt to get the decisionmaker to think about a problem in a substantively different way.

Improving Our Prototype Force Planning Game

One thing that was clear in our prototype game is that our players were neither equally experienced with DMAGs nor representative of typical DMAG participants. We were limited to the community of RAND researchers and recruited one team primarily of individuals with staff-level experience at DoD and a second consisting of former general officers and members of the Senior Executive Service. Although all participants had supported former bosses in preparation for DMAG or similar DoD meetings, none had served in the leadership positions that they were asked to simulate, and only a few had first-hand experience attending a DMAG meeting. These differences limited the representativeness of our players relative to a typical DMAG and thus limit claims that our results will transfer to actual decisionmakers. Going forward, it would make sense to recruit participants who were both equally experienced with DMAGs and representative of typical DMAG participants.

Additionally, we were able to have only current RAND analysts participate in the games, because of sensitivities connected to the analysis that we repurposed from past projects. As a result, players, even those who had held senior positions, were all long-time analysts, and we can expect that their perspectives and decisionmaking differ from individuals who held similar positions and did not opt into analytical roles on leaving government. For example, we might expect analysts to be more amenable to new tools. More specifically, RAND analysts might be expected to have more familiarity and thus a greater receptivity toward RDM analysis. Repeating the game with a different set of participants would help mitigate this potential bias in our research.

The counterfactual narrative for our Move 1 decision context, which we needed in order to recycle past analyses, appeared to create dissonance between it and both the historical past and present day for some players. Indeed, the world has changed since 2015, when the studies were originally conducted, including escalating aggression from Russia and North Korea, a shifting U.S. role in the Middle East, and a new administration with new priorities. The force structure analyses did not account for these new realities, yet the decision context did reflect the present-day question of how to pay for needed modernization. To the extent possible, we asked players to play the game with the information and assumptions that they would have had in 2015,

modified in alignment with our counterfactual. In hindsight, we realize that asking participants to accept a decision context that reflected the past in some respects, the present in others, and our imagination in yet others imposed a large burden. The dissonance was manifested in discussions that departed from the decision context, including arguments that Russia was not adequately represented in the analyses, a tendency to discuss modernization options rather than focus on force structure trade-offs, and concerns about present-day headlines on maintenance and readiness. Going forward, there is a need to ensure that the counterfactual narrative used in the Move 1 decision context does not create dissonance between it and the historical past and present day. This may warrant the design of other decision contexts or exercising the game in the context of entirely different decisions.

We also discovered during the game that Move 2, as designed, did not do a good job of generating the conversation we had intended. Participants used the detailed scenario as a tool to find evidence supporting their preferred position rather than grappling with a sense of regret over a suboptimal outcome.[30] In retrospect, it may have been preferable to elicit regret more directly rather than keeping participants in role for the discussion. Then again, shifting players more firmly into their real-life role as analyst may produce other artificialities. Going forward, future iterations may want to consider alternative designs for Move 2, depending on their objectives and players.

Finally, the most obvious limitation of our prototype is the limited number of iterations and the limited set of players that participated. We found that several players had been previously exposed to the analyses in our experimental and control conditions and thus may have been contaminated before the start of the game with preconceptions about the conclusions, about how the conclusions were developed, or about how they should be communicated. This is not an issue of representativeness; leaders at the DMAG are not shy about voicing preconceptions. However, past exposure to RDM analysis could limit the ability of a comparison to show the effect of RDM-derived information. Being pre-exposed to the treatment could make it appear that the information condition had no effect when, in fact, we would be measuring the same effect in both iterations. However, as it turned out during the game, our senior participants had many queries about the experimental information condition, suggesting a low degree of familiarity with RDM. The nature of discussion among the more junior group suggests that they, too, were less familiar with the materials then we had feared. Going forward, there is a need to select participants who are not pre-exposed to RDM analysis.

This point also connects to a design choice we made—to present the traditional, scenario-based analysis first and then the RDM analysis. We opted to sequence the game this way because we believed that most players were familiar with scenario-based analysis (thus, the briefing presented there would include less new information) and that placing RDM second would therefore minimize contamination. However, this also meant that we are unable to say much

[30] One notable example was participants' insistence that the absence of great-power conflict in the Move 2 scenarios was evidence that their strategy had successfully deterred near-peer adversaries. This reading of events had not been anticipated, much less intended by the scenario designer.

about player learning; that is, did making the decision for a second time consistently shape player choices? Additional iterations of the game in which we invert the order of play would help shed light on this issue.

We ran only four games in total with players chosen from a narrow set of RAND analysts, thus presenting a fundamental limit on the strength of the conclusions. Going forward, more repetitions of the game will be required to better understand the value proposition of analysis for decisionmaking.

Appendix A. Description of a Deputy's Management Action Group

The prototype game simulated a DMAG. This appendix describes the composition, objectives, and process of a representative DMAG. This document was provided as preparatory material to players and, aside from minor editorial fixes (e.g., punctuation), is presented unchanged from its original content.

Purpose

The Deputy's Management Advisory Group (DMAG) serves to advise the Deputy Secretary on major decisions. These may be decisions to be made by the Deputy Secretary, or that the Deputy Secretary will recommend to the Secretary. The DMAG is itself not a decisionmaking body—it serves only to inform decisions by the Deputy Secretary and/or Secretary. The DMAG does not preclude participants from advising the Deputy Secretary and/or Secretary directly through their usual chain-of-command. However, the purpose of the DMAG is to bring together all the key perspectives and positions at one place and time to discuss and debate them. Identifying the pros and cons of the options debated—and where the various participants stand—is an explicit goal of the DMAG and serves to inform the Deputy Secretary.

While consensus is neither the goal nor a required outcome of the DMAG, it is a forum to explore compromise options that are acceptable to a majority of the participants while understanding concerns, risks, and dissenting perspectives.

Organization

The DMAG consists of the following members:

- Deputy Secretary (DMAG Chair)
- Vice-Chairman of the Joint Chiefs of Staff (DMAG Vice-Chair)
- Under Secretary of Defense, Policy
- Under Secretary of Defense, Personnel and Readiness
- Under Secretary of Defense, Acquisition, Technology, and Logistics
- Under Secretary of Defense, Comptroller
- Under Secretary of Defense, Intelligence (not included in our game)
- Director, Cost Assessment and Program Evaluation
- Under Secretary of the Army
- Chief of Staff of the Army (represented by the same player as the service secretary)
- Under Secretary of the Navy
- Chief of Naval Operations (represented by the same player as the service secretary)
- Commandant of the Marine Corps
- Under Secretary of the Air Force

- Chief of Staff of the Air Force (represented by the same player as the service secretary).

Members may be represented by suitable alternates. Depending on the subject matter and/or classification, and as directed by the Deputy Secretary, not all members may be invited to all DMAG meetings and/or additional individuals (e.g., Department of Defense Chief Information Officer, or General Counsel) may be invited to particular meetings.

Conduct of Meetings

To make effective use of time, DMAG meetings will adhere to the following protocol:[31]

- The Deputy Secretary (or in the Deputy's absence, the Vice-Chairman) will introduce the subject matter and the brief(s).
  - The briefer will be allowed to make the presentation with limited interruptions. Interruptions of the presentation should be limited to questions seeking clarification of the material being presented.
- After the presentation is complete, the Deputy Secretary will open the floor to discussion and debate.
  - DMAG participants may direct questions to the briefer and/or each other.
  - DMAG participants should raise any and all concerns, objections, and alternate perspectives they have during this portion of the meeting.
  - The Deputy and/or Vice-Chairman may at any time poll the room to gain an informal sense of where the issue stands.
- While DMAG participants always retain the option of raising concerns and objections directly to the Deputy Secretary and Secretary, all DMAG participants are expected to raise those same concerns at the DMAG meeting.

[31] This is not always true for actual DMAGs but was the protocol for the game events to facilitate a structured discussion.

Appendix B. Guidance on the Positions of Players in the Deputy's Management Action Group

The prototype game simulated a DMAG. This appendix lists the various DMAG player roles and describes each role's position on the force structure decision. This document was provided as preparatory material to players and, aside from minor editorial fixes (e.g., punctuation), is presented unchanged from its original content.

Under Secretary of Defense, Comptroller

USD Comptroller should represent the following positions in the DMAG:

- Counter any options that would violate—either in letter or in spirit—the fiscal guidance provided. An example of the latter would be an option that deferred significant costs from the current budget to future years (such as options to maintain force structure in OCO on the expectation of budget increases in future years).
- When consistent with the point above, favor options that best address the full spectrum of DoD challenges and priorities as opposed to options that favor Service-centric perspectives or priorities.

While the player should begin from the stated position, during Move 1 the player is empowered to alter position based on persuasive analysis and debate.

Under Secretary of Defense, Policy

USD Policy should represent the following positions in the DMAG:

- Modernization of the force is the primary priority for USD Policy.
- USD Policy also finds that air and naval forces provide the greatest flexibility and response options for the primary threats and across lesser threats and contingencies.
- For these reasons, USD Policy prefers option Alt 2 over the other options, and prefers option Alt 1 over the Baseline option.
- USD Policy also argues to ensure the importance of maintaining conventional deterrence is given appropriate weight in the discussion.

While the player should begin from the stated position, during Move 1 the player is empowered to alter position based on persuasive analysis and debate.

Under Secretary of Defense, Personnel and Readiness

USD Personnel and Readiness should represent the following positions in the DMAG:

- Argue for better current readiness for the joint force.

  - Because current readiness funding remains fixed across the options presented, in principle a smaller force structure can be a more ready force structure, at least over the longer term.
  - However, P&R also recognizes that a larger force structure will help alleviate short-term stress on the current force structure. This stress is the source of many current readiness problems.

- Given the above, USD P&R's entering position is a slight preference for options with smaller force sizes (Alt 1 or Alt 2) over those with larger force size (Baseline option).
- P&R will push back on the Services if their readiness-based arguments are suspect or reflect Service-specific priorities instead of the overall readiness of the joint force.

While the player should begin from the stated position, during Move 1 the player is empowered to alter position based on persuasive analysis and debate.

Under Secretary of Defense, Acquisition, Technology, and Logistics

USD Acquisition, Technology, and Logistics should represent the following positions in the DMAG:

- USD AT&L's priority is modernizing the force, even at the expense of significant force structure.
  - The USD AT&L's position is losing the traditional overmatch of the U.S. military over all others is the greatest strategic military risk facing the nation.
  - Modernization investments must be increased as much as possible to restore U.S. overmatch.
- For this reason, USD AT&L prefers options Alt 1 and Alt 2 over the Baseline option.

While the player should begin from the stated position, during Move 1 the player is empowered to alter position based on persuasive analysis and debate.

Under Secretary of the Army / Chief of Staff of the Army

The Army representative should represent the following positions in the DMAG:

- The Army prioritizes options that preserve force structure over modernization for several reasons:
  - Potential significant demands for Army in peacetime will strain a smaller force.
  - Army needs an opportunity to reset from the extensive deployments of the past 14 years—hard to do if Army force structure is reduced.
  - Deterrence in Europe will require increased Army posture in Europe—also hard to do if Army force structure is reduced.
- For this reason, the Army prefers the Baseline option most of all, and option Alt 1 over option Alt 2.

- The Army believes the base scenarios are too narrow and don't reflect the full extent of potential demands on the Army.
- The Army position is that conventional deterrence of Russia requires a significant Army forward posture in eastern Europe and cannot be achieved purely by air and naval forces.

While the player should begin from the stated position, during Move 1 the player is empowered to alter position based on persuasive analysis and debate.

Under Secretary of the Navy / Chief of Naval Operations

NOTE: Players were instructed to focus on Navy interests in order to prevent confusion over the role's relationship to the Commandant of the Marine Corps.

The Navy representative should represent the following positions in the DMAG:

- The Navy prioritizes options that prioritize modernization over force structure.
- The Navy nevertheless is concerned about the size of the fleet given the continuing peace-time demands for naval presence around the world.
- Naval forces provide flexible response options around the world, without needing to request or rely on potentially inconvenient or unavailable foreign basing (beyond our established traditional allies in NATO, Japan, and the Persian Gulf). And so Naval forces should be protected from force reductions.
- For this reason, the Navy prefers option Alt 2 most of all, and option Alt 1 over the Baseline option.
- The Navy position is that large ground combat in Europe is unrealistic, and posturing significant Army forces in eastern Europe is escalatory and politically infeasible, and that suitable deterrence in Europe can be achieved with air and naval forces.

While the player should begin from the stated position, during Move 1 the player is empowered to alter position based on persuasive analysis and debate.

Under Secretary of the Air Force / Chief of Staff of the Air Force

The Air Force representative should represent the following positions in the DMAG:

- The Air Force prioritizes options that prioritize modernization over force structure.
- The Air Force nevertheless is concerned about the limited numbers of both tactical aircraft and bombers given the continuing peace-time demands for presence around the world and the rise of adversaries with sophisticated air defense systems and near-peer competitors with air forces that approach U.S. capabilities.
- Air Forces are the easiest forces to flex and rapidly deploy to any crisis, and so should be protected from force reductions as much as possible.
- For this reason, the Air Force prefers option Alt 2 most of all, and option Alt 1 over the Baseline option.

- The Air Force position is that large ground combat in Europe is unrealistic, and posturing significant Army forces in eastern Europe is escalatory and politically unrealistic, and that suitable deterrence in Europe can be achieved with tactical air force units.
    - More tactical units should be forward positioned in western Europe in peacetime (without being perceived as escalatory), and additional tactical units can be rapidly surged in times of crisis.

While the player should begin from the stated position, during Move 1 the player is empowered to alter position based on persuasive analysis and debate.

Commandant of the Marine Corps

The Marine Corps representative should represent the following positions in the DMAG:

- The USMC prioritizes options that preserve force structure over modernization for several reasons:
    - Already significant demands for Marine forces in peacetime will strain a smaller USMC force structure of both options Alt 1 and Alt 2.
    - Reductions in amphibious ships (in the Baseline and Alt 2 options) make impossible the execution of a full 2 MEB amphibious landing operations.
- The Marine Corps' preferred option is Alt 1 because it balances a modest end-strength reduction for the USMC with an increase in amphibious ships. The Marine Corps is opposed to option Alt 2 because it reduces both end-strength and amphibious ships.

While the player should begin from the stated position, during Move 1 the player is empowered to alter position based on persuasive analysis and debate.

Appendix C. Decision Context

A key in the game design is the context surrounding the decision in the first move. That is, what is motivating the decision in the first place, and what else is going on in the environment that should, in principle, affect decisionmaker assumptions, equities, or preferences? In all cases, the decision context has a large effect on decisionmaking; thus, the game design requires establishing a common baseline among participants about the major assumptions about the political, military, economic, and social context at the time of the decision. This appendix describes the decision context developed for our prototype game. It is presented in the form of a memo from the Deputy Secretary of Defense to the game participants. Aside from minor editorial fixes (e.g., punctuation), this document is presented unchanged from its original content.

FROM: Deputy Secretary of Defense

TO: Vice Chairman of the Joint Chiefs of Staff; Under Secretary of Defense, Comptroller; Under Secretary of Defense, Policy; Under Secretary of Defense, Personnel and Readiness; Under Secretary of Defense, Acquisition, Technology, and Logistics; Under Secretary of Defense, Intelligence; Director, Cost Assessment and Program Evaluation; Under Secretary of the Army; Chief of Staff of the Army; Under Secretary of the Navy; Chief of Naval Operations; Commandant of the Marine Corps; Under Secretary of the Air Force; Chief of Staff of the Air Force

SUBJECT: **Force Structure Options for PB-17**

SUMMARY:

As a result of the recent Budget Priorities Reconciliation Act (BPRA), the Budget Control Act (BCA) is repealed and the Department of Defense base budget appropriation will increase by $50B starting in FY16. However, $30B of this increase must be allocated to transitioning current readiness-related elements from Overseas Contingency Operations into the DoD Base Budget (with a corresponding reduction in OCO funding) (TAB A).

This DMAG session will focus on how the remaining $20B increase to the Department's budget should be allocated between force structure and modernization. There will be no increases to force structure: The question is whether to make selected reductions to force structure to fund increased modernization. The DMAG of 18 March 2015 identified three options with different balances between force structure and modernization and directed both a Force Structure Review (FSR) to inform force

structure decisions (TAB B) and a Strategic Portfolio Review (SPR) to inform modernization priorities.

This DMAG session is a decision meeting. After debating the Force Structure Review assessment (TAB C), the Deputy Secretary will take his decision to the Secretary. Following the Secretary's decision, a subsequent DMAG will debate the Strategic Portfolio Review assessment and decide on modernization priorities.

As a reminder to all (especially attendees participating in a DMAG for the first time), the DMAG rules-of-the-road are attached (TAB D).

TAB A: Background on the Budget Priorities Reconciliation Act

TAB B: Force Structure Options

TAB C: Force Structure Review Assessment[32]

TAB D: DMAG Guidance[33]

TAB A
BACKGROUND ON THE BUDGET PRIORITIES RECONCILIATION ACT

On February 18, 2015, the President and leaders of the Congress announced they had reached a budget agreement that would repeal the Budget Control Act. The elements of this complex agreement relevant to the Department of Defense are as follows:

1. The Budget Control Act (BCA) is repealed.
2. The annual base budget for the Department of Defense is increased by $50B over the amount requested in the President's budget submission for FY15 (PB15).
3. This increase will be reflected in the FY17 NDAA and future year NDAAs.
4. The FY16 budget as reflected in the FY16 NDAA is unaffected by this agreement.
5. Of this $50B increase, $30B will be budgeted to transition readiness-related items from Overseas Contingency Operations into the base budget.
    1. This transition is to be reflected in the President's budget submission for FY17 (PB17).
    2. Overseas Contingency Operations funding will be reduced accordingly starting in FY17, and the transition is to be reflected in the President's request for OCO funding for FY17.

The Congress made this agreement formal in the Budget Priorities Reconciliation Act, signed into law by the President on March 1, 2015.

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[32] TAB C contained classified material and thus is not reproduced in this report.

[33] The DMAG guidance is reproduced as Appendix A in this report.

TAB B
FORCE STRUCTURE OPTIONS

Background

Budget Priorities Reconciliation Act (BPRA) provides a net increase to the Department of Defense budget of $20B. This increase is urgently needed to address:

1. Modernization that has been postponed, significantly eroding the Department's overmatch in critical warfighting domains;
2. Munition shortfalls in many advanced weapon types to levels that fall significantly short of those needed to execute key war plans;
3. Stress on the force, both from overuse and lack of essential maintenance and reset.

The $20B increase is insufficient to robustly address these problems. The Department is forced to consider making reductions in force structure to fund additional modernization investments.

Context

Several decisions that narrow the force structure options have already been made.

1. The President has directed the Secretary of Defense not to plan for long-term counter-insurgency operations.
2. Based on a net assessment that the *de facto* status of Russian political and military support in eastern Ukraine is unlikely to proceed beyond its current level, the President has directed the Secretary of Defense to maintain a deterrent but non-escalatory posture in Europe.
3. The Secretary of Defense has directed that after a decade of neglect there will be no net reductions in funding for modernization in any of the service budgets.

Given this situation and guidance, elements of OSD favored large investments in modernization and munitions citing wargames and analyses that highlight an erosion of U.S. "overmatch" relative to China and regional powers acquiring high-end weapon systems. The military services, on the other hand, favored preserving force structure to ameliorate stress on the force, bolstering their arguments with years of Congressional testimony on deteriorating readiness.

This debate was the focus of the DMAG on March 18, 2015. After much debate, the Deputy Secretary and Vice-Chairman of the Joint Chiefs of Staff agreed (1) on three specific options for allocating resources between force structure and modernization, (2) that these options would be intensively analyzed over the next 90 days, and (3) that a subsequent DMAG in June 2015 (the current DMAG) would make a decision between the three options.

The Three Options

The three options that the Deputy Secretary and Vice-Chairman agree to consider are:

Option	Force Structure	Modernization
Baseline	PB15	PB15 **plus $20B** / year
Alt 1	PB15 **minus $40B** / year **(Even Cuts across Services)**	PB15 **plus $60B** / year
Alt 2	PB15 **minus $40B** / year **(Prioritize Air & Naval Forces)**	PB15 **plus $60B** / year

Assessments Conducted

After the March DMAG, the Deputy Secretary commissioned several independent assessments of these options, to run in parallel, providing independent recommendations to the Deputy Secretary and Vice-Chairman:

1. A Force Structure Review (FSR) to examine the alternative force structures
2. A Strategic Portfolio Review (SPR) to inform priorities modernization.

Both reviews were to be completed in 90 days.

Of note, the Deputy Secretary chartered an independent team to conduct each of these reviews.

The Force Structure Review team was staffed by members of Policy, CAPE, and each of the Services. The Deputy Secretary directed the team to conduct its analysis comparing and contrasting the three force structure options above without the usual DoD requirements for consensus or coordination.

This DMAG is focused on the Force Structure Review. A future DMAG will focus on the Strategic Portfolio Review.

Appendix D. Move 2 Scenarios

We developed the following four scenarios to stress the weaknesses of each of the force structure decisions that players may have made in Move 1. Because the goal of introducing these stressing scenarios was to provoke a sense of regret in players, our primary consideration in constructing them was presenting a novel and unexpected problem to players. Thus, they were designed specifically for game purposes to provoke particular reactions from the players, and they are not intended to be predictive, or even particularly plausible.

One of these scenarios was provided to the players during each game, based on the control team's assessment of which scenario would be most stressing. Scenarios were not repeated within a group. Aside from minor editorial fixes (e.g., punctuation), the scenarios are presented unchanged from their original content.

Scenario 1: One Major Regional War, No Access to Reserve Compound, Stressing U.S. Army BCT, CAB, and USAF TACAIR

Pakistan's Civil War

In the end, the fabric of the Pakistani state proved too tenuous to hold all the contradictions it contained. Born of partition and then sundered by a second partition along geographic lines, the last three decades saw the constitutionalists of the legal profession and courts against the entrenched family interests, modernizers versus traditionalists, Sunnis versus "heretics," Islamists pitted against moderates, and the tribal societies in the hills holding little in common with the urban interests in the ports and plains. Even within the ruling circles the divisions were many, deep and growing. Though far from being a sole triggering cause, re-engagement of increasing U.S. forces in Afghanistan through 2018 and 2019 further raised dissention internally among the ruling groups in the Army, ISI, diplomatic corps, political parties and business interests. Though long-simmering, the unraveling, when it came, happened with a rapidity that made observers wonder, in retrospect, what had held things together so long. By spring 2020, the country was spinning into domestic turmoil bearing a strong resemblance to the descent of the Syrian state into murderous chaos.

Who's Got the Nukes?

While the endless permutations of factional control, in-fighting, and territorial governance made assessing likely outcomes impossible, the paramount question for U.S. planners was: who controls the nukes? As an effective fighting force, the army divided into at least two principal factions, largely around the lines of pragmatists and moderates versus traditionalists and Islamists. The country could be effectively described as a government core around

Islamabad/Rawalpindi (also incorporating the northern two-thirds of the Punjab); a solid pro-government, but precariously isolated enclave in Karachi, the most populous city; and either a highly uncertain or decidedly anti-government situation everywhere else. Most facilities for Pakistan's nuclear program—and all existing weapons and fissile material—lay within residual government control. But this was a situation that could easily change. Some of the weapons clusters on the southern-most periphery of the Punjabi control zone were held only by the continued loyalty of the forces in that region. The Islamabad/Rawalpindi region, solid as was the military position, was close enough to the traditionally tumultuous Northwest that the regime would do little to imperil that local superiority by reinforcing those positions in the middle portion of Punjab. Possession of that region—and the nuclear materials it held—was tenuous and threatened. Transport of the existing WMD material to the capital was feasible, but beyond the resources (and timetable) that the leadership in Islamabad possessed.

Very much to their own surprise, the remaining army and national leadership came to feel that they had little recourse but to rely on U.S. military assistance. This is far from the course they would have chosen, but they realized that they were facing a choice between the U.S. helping them retain control over their own weapons and facilities or having an increasingly nervous India step over Pakistani defenses, weakened to the point of impotence, and seizing them for itself. Chinese assistance was too far, too untested, and likely to create in the heart of a tumultuous internal situation an international crisis of immense proportions. Reluctantly, the call was made to the Oval Office.

Options Considered by NSC

There were many cogent arguments against a decision to intervene on the ground. These were all laid against the paramount issue of nuclear control and so ultimately, while acknowledged by the President, found to be wanting in the balance. The directive was made to secure the nuclear facilities in Pakistan, to support the forces doing so, and to create safe corridors for such activities to be sustained and supplied.

This could be done in three ways. The first would be to respond to positive overtures from India who offered not only land and sea facilities but a corridor for safe conduct of U.S. forces and logistics to within a short distance of every portion of Punjab. But this had two major objections. The first is that, given the size of the U.S. forces involved, no one among the services was pleased about having to rely upon a foreign partner, no matter how motivated, for security and logistical control. The second was the matter of optics: U.S. troops coming from India could not help but be perceived by the bulk of Pakistanis as an invading force in cahoots with the hated enemy. It would be a PR windfall for the Bad Guys. A second choice was at first glance the most attractive. The U.S. would join the millennia-old list of armies to move through the Khyber Pass—at least figuratively. There was a reasonably secure and well-developed logistical base in Afghanistan, the weather was favorable, elements of the Pakistani army were willing to cooperate in securing both ends of the necessary corridor and distances, and hence the U.S. footprint would be short.

But the Khyber option had one major objection. The U.S. logistical base in Afghanistan is currently supplied from the ports of Karachi and then by truck convoy into Afghanistan (via either Torkham Gate or Chaman Gate). This then led, reluctantly, to the third choice. The U.S. would kill two birds with one stone and give itself options by establishing a position, at the invitation of the government, in Karachi. It could then either securely sustain the Khyber Pass approach into the Punjab or, should conditions warrant, move inland through Sindh to secure the southernmost portion of Punjab where the nuclear facilities at greatest hazard lay. It would be a major commitment of land forces and TACAIR. Now the question was how many of the required BCT, CAB, special ops, and other assets could be brought quickly into the region.

Reserve Component Engaged in Support to Civil Authorities

Tensions in the Korean peninsula were approaching conditions just short of war. Increasingly egregious DPRK violations of missile and nuclear testing bans despite savage sanctions (the world was discovering the truth of the adage that in Korea there is always another notch in the belt) led to counter-moves by the U.S. of enhanced commitments of ground but especially USAF and USN TACAIR assets—the latter taken most unwillingly by the services but nonetheless endorsed by an NSC undergoing almost continuous churn through directors. At the same time, what was widely seen by many observers as a near-unilateral abrogation of the JCPOA with Iran and the resulting (but very carefully orchestrated and limited) "break out" by Iran from its nuclear obligations created another near-war situation in Central Asia. Again, the USN and USAF commitments to CENTCOM could not be modified without the risk of sending unintended signals in an environment in which any move, no matter how small, was subject to intense scrutiny and analysis for potential indicators of intent.

Such contingencies had been foreseen in prior U.S. war planning. What came as a shock for the services, however, was to discover that they had almost no access to the RC due to a chain of circumstances. The unrelated crises presented by the potential for excessive street violence and its escalating consequences during the primary season of the 2020 election, as well as the continued experience of U.S. cities suffering though a soggy spring of repeated "100-year," "500-year," and even "1,000-year" downpours, nevertheless had the same effect. They meant that Army National Guard and some Reserve assets, and the state politicians who had claim on the former, had their hands full with local emergencies. A series of improbable but nonetheless all too real and all too highly publicized disasters suffered by ANG units in Afghanistan in 2018–2019 led to what amounted to an informal freeze or disinclination on the part of the president to allow further use of ANG elements outside of the U.S. The actual status of the RC appeared to change from day to day and meeting to meeting. The previously mentioned turmoil in the NSC meant that the services could not reliably count on an advocate pressing for an RC element to any projected deployments.

Domestic Terrorism Consumes Reserve Component TACAIR

This was amplified by the South Bend Incident, in which a large civil aircraft had been hired, loaded with incendiary chemicals, and flown into a largely vacant but nonetheless prominent twenty-one story hotel and office complex in the heart of that city's downtown. Actual loss of life and financial damage was minimal, but the spectacular footage repeated 24/7 for weeks led to large CAP-style deployments by RC TACAIR elements throughout the U.S.—to dubious real effect but large-scale approval for this unilateral presidential action. The number of U.S. cities of South Bend–scale and above turned this into a near continuous mission. Effectively, the Air National Guard squadrons were completely unavailable for overseas operations.

Scenario 2: One Major Regional War, No Access to the Reserve Component, Stressing U.S. Army BCT, CAB, and USAF TACAIR

Iran Determined to Hold and Extend Gains

By early 2018, it became clear that Bashar al-Assad and the Alawi/Shi'a regime were the Syrian civil war's winner on points. Not all the country came under government control, but most of what remained could best be described as pockets, albeit some of significant size, especially in the north. Iranian al-Quds forces and Hezbullah were very prominent in shoring up and consolidating the regime's winnings, both militarily and politically. Thus, the Assad assassination in late 2019 found an Iran very ill-disposed to see any change in status that would diminish its role and presence in Syria. This was deemed vital both for securing communications through to southern Lebanon but also to continue gradual but steady escalation of influence in an Iraq coming increasingly into its orbit, thus sustaining the Shi'a arc through the region.

What was widely seen by many observers as a near-unilateral abrogation by the U.S. of the JCPOA with Iran also put the latter into a frisky mood. Rather than the almost inevitable but nonetheless carefully orchestrated and limited "break out" by Iran from its nuclear obligations expected by most observers, the regime instead sought to demonstrate its independence of action freed from its international constraints. It declared its intention and readiness to place all nuclear facilities back into operation. The ayatollahs gambled that Iran would still represent a tough and not very palatable nut for the U.S. military to crack despite threats by successive administrations of all options being on the table. Nevertheless, they sought to create a second front both as a diversion as well as a potential means to weaken its enemy's will that could be dialed up or down as Teheran saw fit.

Jordan at Risk

The gradual infiltration of uprooted IS elements into Jordan led to the mounting of an aborted rising against the government in 2019. Although the issue was never much in doubt, the damage done to the political fabric of Jordan was nonetheless profound. The phenomenon of some scattered units of the Royal Jordanian Army appearing to balk at carrying out orders to engage

the insurgency was shattering for its reputation of dependability and self-image going back to the legacy of the Arab Legion. This led to a wave of repercussions and reassessments of allegiances and loyalties throughout the military establishment. This was both amplified by and amplified the similar process going through most institutions of civil society. Though the Hashemite dynasty was still in control, that control was now being openly assessed and tested as it never had been previously.

Thus, Jordan's threat became existential when through the winter and on into the spring of 2020 it became clear that units of the Syrian army, accompanied by both Hezbullah and the al-Quds force elements, were infiltrating into northern Jordan in "hot pursuit" of the by now all-but-extinguished remnants of IS. And they were doing so at the end of a chain of control that extended not only into Syria but in some cases western Iraq. While Baghdad was largely silent, memories were long of Jordan's near-isolated stance in support of the Saddam regime in the 1991 Gulf War and again in 2003. Meanwhile, the reconstituted Alawi/Shi'a regime in Damascus made little secret of its scorn for the latter-day "Hashemite harlots" of Sunni Jordan. Hezbullah had long ceased to be a local actor, first in southern and then the entirety of Lebanon, that it once had been. It now largely viewed itself (and was viewed by others) as the leading edge of Iran's principal military and geopolitical innovation: the armed Shi'a militia. Their media spoke openly of the possibility of outflanking the "little Satan" by reopening the Jordan Valley front of active engagement with Israel.

China Ratchets Up Long-Planned Opportunity

At the same time, after a three-year period of dormancy, China once more sought to enhance its "rock collection" in the South China Sea. Reports from various sources, both covert and public, indicated a wind up of major efforts to claim more of the disputed atolls and put in place a more definitive Chinese footprint in the form of new defense and civil installations, assertions of exclusive economic rights and warnings of violations of Chinese sovereignty by those traversing the Nine Dash Line. The President wished to demonstrate both U.S. presence and resolve.

Options Considered by NSC

Although the essence of the U.S. problem in Syria's civil war was that there was no viable side that it wished to see come out a winner, the result was viewed widely as a major loss of U.S. prestige in favor of Russia and Iran. The nuclear breakout of Iran did not appear amenable of a direct military confrontation because of 1) potential political or military allies' perception of the U.S. role in the demise of JCPOA and 2) the seriousness of the potential opposition that faced them on the ground and in the air as a result of Russian S-400 deliveries. In light of this, the potential loss of Jordan after its long association with the U.S. was viewed an outcome to be averted at all costs. And a U.S. presence in Jordan, after a successful defense of its integrity, would be perceived by both the Iranian axis and the states of the Sunni Arab world as a considerable check on Iranian ambitions.

Thus, when formally requested by its government, the President directed that substantial U.S. forces be placed on the ground in defense of the Kingdom of Jordan. The directive asserted that the force should be well supported, capable of both its own defense and a "meaningful" offensive capability and that its insertion should be made most obvious and transparent to all observers. These boots on the ground were also to be carrying loud and clear the message that the U.S. was back—and not feeling particularly kindly disposed toward those who threaten its friends.

The port of Aqaba had gone through considerable upgrading over the past two decades to become a major facility, more than capable of handling the sealift necessary for deployment and logistics. While the Israelis were quietly delighted by the U.S. decision, they could not provide TACAIR or other direct support both for obvious political reasons as well as the nature of their understanding with Russia vis-à-vis the informal rules of engagement against Hezbullah. This, too, would need to come from USAF and USN assets with the Egyptians and Saudis nominally securing the U.S. flanks along the Red Sea.

Reserve Component Engaged in Support to Civil Authorities

Tensions in the Korean peninsula were approaching conditions just short of war. Increasingly egregious DPRK violations of missile and nuclear testing bans despite savage sanctions (the world was discovering the truth of the adage that in Korea there is always another notch in the belt) led to counter-moves by the U.S. of enhanced commitments of ground but especially USAF and USN TACAIR assets—the latter taken most unwillingly by the services but nonetheless endorsed by an NSC undergoing almost continuous churn through directors.

Such contingencies had been foreseen in prior U.S. war planning. What came as a shock for the services, however, was to discover that they had almost no access to the RC due to a chain of circumstances. The unrelated crises presented by the potential for excessive street violence and its escalating consequences during the primary season of the 2020 election, as well as the continued experience of U.S. cities suffering repeated "100-", "500-" and even "1,000-year" inundations that soggy spring, nevertheless had the same effect. They meant that Army National Guard and some Reserve assets, and the state politicians who had claim on the former, had their hands full with local emergencies. A series of improbable but nonetheless all too real and all too highly publicized disasters suffered by ANG units in Afghanistan in 2018–2019 led to what amounted to an informal freeze or disinclination on the part of the president to allow further use of ANG elements outside of the U.S. The actual status of the RC appeared to change from day to day and meeting to meeting. The previously mentioned turmoil in the NSC meant that the services could not reliably count on an advocate pressing for an RC element to any projected deployments.

Domestic Terrorism Consumes Reserve Component TACAIR

This was amplified by the South Bend Incident, in which a large civil aircraft had been hired, loaded with incendiary chemicals, and flown into a largely vacant but nonetheless prominent twenty-one story hotel and office complex in the heart of that city's downtown. Actual loss of

life and financial damage was minimal, but the spectacular footage repeated 24/7 for weeks led to large CAP-style deployments by RC TACAIR elements throughout the U.S.—to dubious real effect but large-scale approval for this unilateral presidential action. The number of U.S. cities of South Bend–scale and above turned this into a near continuous mission. Effectively, the Air National Guard squadrons were completely unavailable for overseas operations.

Scenario 3: Peace Plus a Small Contingency, No Reduction in Foreign Presence Demands, No Access to Reserve Component, Stressing to USAF TACAIR

Crisis in Venezuela; China Calls U.S. Bluff

By the spring of 2020, the long-simmering crisis and accompanying civil conflict in Venezuela became internationalized. Beginning in the hard winter of 2018, the Chinese economic and accompanying political presence began to be ramped up in earnest. While the actual amount of aid in money and in kind provided by the Chinese may have been less than portrayed in the public media, it was given credit by many in Venezuela and in the rest of Latin America as having been decisive in staving off human disaster and was compared favorably to the U.S. increasingly inimical posture toward the Madurista government.

The enhanced PLAN presence added to this atmosphere. At first represented only by a few very highly publicized port calls by a few units of the blue water PLAN, what many observers thought impossible previously began to happen with astonishing frequency. The port calls became more frequent and more extended, and by the beginning of the year most pretense was laid aside. A very small but none-the-less constant PLAN flotilla was in being in the Americas. Venezuela accepted Chinese aid, engineering, and construction assistance to "extend and expand" the port facilities at Puerto Cabello. The plans were clearly intended to provide for local PLAN logistical support on a more permanent basis.

When the first battalion of PLAN marines went ashore, the crisis became intense, especially when SATINT disclosed a previously covert upgrading of local airport facilities with specifications sufficient to support PLAN air assets. The U.S. referred to its responsibilities and prerogatives under the Monroe Doctrine and began a campaign of intimidation carried out more in the public media than through the diplomatic back channels that by that time had become considerably attenuated. The president declared that the U.S. bluff had been called by the Chinese and "Venezuelan Marxist thugs" who were about to discover that U.S. intentions were far from being a bluff. Muddled reports of U.S. citizens being detained as a regime response to what was viewed as a not-so-thinly veiled threat led to immediate calls for action within Congress.

Simmering Tensions Prevent U.S. Disengagement from CENTCOM and PACOM

Under normal circumstances, the apparent Chinese boldness could have been viewed as most unwisely probing the hornets' nest, operating as they were in the U.S. maritime backyard. Yet, several factors mitigated the geopolitical risk. Tensions in the Korean peninsula were approaching conditions just short of war. Increasingly egregious DPRK violations of missile and nuclear testing bans despite savage sanctions (the world was discovering the truth of the adage that in Korea there is always another notch in the belt) led to countering moves by the U.S. to enhance commitments of ground but especially USAF and USN TACAIR assets—the latter taken most unwillingly by the services but nonetheless endorsed by an NSC undergoing almost continuous churn through directors. At the same time, what was widely seen by many observers as a near-unilateral abrogation of the JCPOA with Iran and the resulting (but very carefully orchestrated and limited) "break out" by Iran from its nuclear obligations created another near-war situation in Central Asia. Again, the USN and USAF commitments to CENTCOM could not be modified without the risk of sending unintended signals in an environment in which any move, no matter how small, was subject to intense scrutiny and analysis for potential indicators of intent.

Options Considered by NSC

This greatest challenge to the tenets of the Monroe Doctrine in sixty years, as well as the ominous threat looming over American assets and citizens in Venezuela, demanded response in kind. While bellicose language spewed from the loudspeakers on every street corner in Caracas, the Chinese were noticeably carrying out a policy of speaking softly and proceeding with care and caution once their original surprise lodgment was established. They sought to provide no casus belli. Nevertheless, the U.S. wished to show its determination and be prepared when the opportunity arose either to apply pressure or to sustain aid in support of any evacuation that might be necessary. Two CVN groups and support assets were now to actively patrol the southern Caribbean Sea and considerable TACAIR assets were to be forward staged to Muñiz ANG base in Puerto Rico supported out of the Air Force bases in the south of Florida as well.

Domestic Terrorism Consumes Reserve Component TACAIR

This was amplified by the South Bend Incident, in which a large civil aircraft had been hired, loaded with incendiary chemicals, and flown into a largely vacant but nonetheless prominent twenty-one story hotel and office complex in the heart of that city's downtown. Actual loss of life and financial damage was minimal, but the spectacular footage repeated 24/7 for weeks led to large CAP-style deployments by RC TACAIR elements throughout the U.S.—to dubious real effect but large-scale approval for this unilateral presidential action. The number of U.S. cities of South Bend–scale and above turned this into a near continuous mission. Effectively, the Air National Guard squadrons were completely unavailable for overseas operations.

Scenario 4: Peace Plus a Small Contingency, No Reduction in Foreign Presence Demands, No Access to Reserve Component, Stressing to USAF TACAIR

Turkey in Chaos, Middle East in Turmoil

The rule by the AKP party, and that of President Edoğan, became increasingly more repressive under the new constitution and ever-renewed state of emergency imposed in 2016–2017. To all appearances, it appeared to indicate the accession to complete power of a modernized conception of Ottoman identity and the final supplanting of the Kemalist construction of the Turkish state. But the latter had imbued the institutions of the country for the better part of a century. Such traditions are less easy to remove at their root than the seeming ease with which their outward manifestations may be suppressed. Throughout 2018 and 2019, there were few surface manifestations of unrest, but by the succeeding winter the submerged political backlash came to the surface triggered, in part, by the severe climatological events that led to widespread dislocation. Alternating periods of severe drought and subsequent inundation throughout Anatolia fed a discontent that resulted in civil outbreaks of increasing number and intensity as spring 2020 arrived.

U.S. presence in the Eastern Mediterranean was represented by the carriers of its 6th Fleet and the USAF contingent at the Incerlik airbase on Turkey's southeast coast. The latter became pressed hard both from inside and outside. The pace of air operations required by U.S. support in the continuing chaos sweeping Syria after the Assad assassination, northern Iraq after unilateral declaration of Kurdish independence, and Jordan after the aborted but savage Islamist coup by residual IS elements continued without let up. It was deemed all the more important as Russia, once again perceiving an opportunity, moved considerable air and more limited yet nonetheless highly publicized naval elements into Latakia and off-shore.

The outside pressure on Incerlik and the naval position in the Eastern Mediterranean grew as the Turkish unrest—endemic in the Kurdish areas of the east and southeast—began to spread to the adjacent Adana-Hatay region. Although this area was not ethnically Kurdish, as was the case in the 2015 elections, those disaffected with the regime found a broad base could be formed on the foundation of Kurdish political mobilization. Not coincidentally, these portions of coastal Turkey—also closest to Russia's Syrian bases—saw this mobilization encouraged by a healthy dollop of dezinformatziya directed against the U.S. presence in the center of this region. This led to increasing reports of threats to other U.S. government and private assets in Turkey, along with incidents of harassment and violence toward individual U.S. citizens. The need for major relief operations capabilities in the Eastern Mediterranean became apparent to all.

Opportunities for China and Iran

At the same time, after a three-year period of dormancy, China once more sought to enhance its "rock collection" in the South China Sea. Reports from various sources, both covert and

public, indicated a wind up of major efforts to claim more of the disputed atolls and put in place a more definitive Chinese footprint in the form of new defense and civil installations, assertions of exclusive economic rights, and warnings of violations of Chinese sovereignty by those traversing the Nine Dash Line. The President wished to demonstrate both U.S. presence and resolve.

Meanwhile, demands for both air and naval presence grew after what was widely seen by many observers as a near-unilateral abrogation of the JCPOA with Iran and the resulting (but very carefully orchestrated and limited) "break out" by Iran from its nuclear obligations created another near-war situation in Central Asia. Again, the USN and USAF commitments to CENTCOM could not be modified without the risk of sending unintended signals in an environment in which any move, no matter how small, was subject to intense scrutiny and analysis for potential indicators of intent.

Appendix E. Detailed Thematic Analysis of Move 1 Discussion

To provide a more transparent alternative to traditional game analysis based on expert observation and insight, we conducted a thematic analysis of the results of each game. For thematic analysis, a single team member (1) coded each statement made by participants, as recorded in a consolidated partial transcript that was compiled from three sets of notes, and then (2) compared the counts of each code across different games. Table 1 shows the results of this analysis.

Table 1. Frequency with Which Each Theme Was Coded in Each Game

	Game Description			
Theme	**Mid-Level Officials, Scenario-Based Analysis**	**Mid-Level Officials, RDM Analysis**	**Senior Officials, Scenario-Based Analysis**	**Senior Officials, RDM Analysis**
Clarifying decision environment *Status of re-organization for specific office*	3	0	1	0
Clarifying scenarios *Requirements for specific types of forces in a given operation*	7	8	17	6
Clarifying force structure options *Which force sizing construct was used?*	14	8	8	10
Clarifying analytical results *Method for computing sufficiency*	0	9	0	5
Faulting assumptions or missing considerations *Analysis does not consider forces needed to sustain demand*	15	10	13	14
Problem with scenario demand assumptions *Access to reserve overly optimistic*	4	1	8	2
Problem with selection of scenarios *Missing an important scenario*	7	2	5	1
Likelihood of scenarios *Not all the cases included are equally likely*	1	2	3	1
Problem with available supply *Concerned only considering "hard" scenarios*	5	5	4	2
Trade-offs between force structure and modernization *Effectiveness, and thus the value, of force structure depends on modernization*	15	6	21	10
What are the criteria for decisions	22	20	10	8

Theme	Game Description			
	Mid-Level Officials, Scenario-Based Analysis	**Mid-Level Officials, RDM Analysis**	**Senior Officials, Scenario-Based Analysis**	**Senior Officials, RDM Analysis**
Interested in force structure that increases ability to project presence over crisis response forces				
Risks from an option *Force structure option would put target metrics for readiness at risk*	10	13	8	4
Propose a new option *Even alternative 2 does not do enough to increase air power*	6	1	3	3
Preferred outcome *Recommend alternative 1*	11	4	17	12

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