Clarity or Collaboration: Balancing Competing Aims in Bureaucratic Design

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Following the Gulf oil spill and US housing meltdown, policymakers revamped the associated administrative infrastructure in an effort to sharpen each agency’s focus, based on the perspective that asking an organization to fulfill competing missions undermines performance. Using a formal model, I demonstrate that priority goal ambiguity introduced when an agency balances multiple roles does have detrimental effects. Yet, assigning competing missions to one organization can be better than separating them, as the underlying tasks supporting the goals may require coordination. In fact, it is precisely when ambiguity becomes more debilitating that the importance of coordination intensifies. Moreover, if the bureau is misinformed about which goals are more valued politically, fostering uncertainty in agencies charged with multiple goals can even be beneficial. The study thus describes how such organizations function and why these arrangements persist, demonstrating that structural choices impact behavior even when agencies and overseers agree on policy objectives.

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Searching for explanations following the April 2010 explosion on a BP-leased drilling rig which caused an oil spill that would deposit almost five million barrels into the Gulf of Mexico, investigators focused critical attention on the Department of the Interior’s (Interior) regulator of offshore drilling, the Minerals Management Service (MMS). One prominent theory connected MMS’s regulatory approach to its organizational design which combined oversight with offshore leasing and tax collection duties, prompting Secretary of the Interior Ken Salazar to declare MMS “has three distinct and conflicting missions that…must be divided” (Interior, 2010b). The Obama administration announced MMS’s disbanding roughly a month after the spill began. Yet, underlying the focus on its competing goals, MMS’s dissolution also revealed the importance of coordinating the activities supporting those goals. In fact, MMS’s creation in 1982 was an effort to encourage collaboration among Interior’s oil and gas missions (Carrigan, 2014). It is not surprising then that Secretary Salazar asserted MMS’s successors needed to maintain “close program coordination” to ensure a “functioning and effective process” (Interior, 2010a: 11).

MMS was hardly the only agency under scrutiny at that time. In the aftermath of the US housing meltdown, critics alleged the agencies charged with oversight managed other missions which limited their abilities to effectively oversee the associated industries. In a hearing of the House Committee on Financial Services one month before the Gulf explosion, Representative Spencer Bachus (R-Alabama) asserted, “It is worth examining whether the Federal Reserve should conduct monetary policy at the same time it regulates and supervises banks….It is no exaggeration to say the health of our financial system depends on getting this answer right” (2010: 2). Still, like MMS, the Fed’s design demonstrated a tension between managing multiple goals and encouraging task coordination. Testifying in support of the existing structure, then chairman Ben Bernanke explained, “Even as the Federal Reserve’s central banking functions
enhance supervisory expertise, its involvement in supervising banks…significantly improves the Federal Reserve’s ability to effectively carry out its central bank responsibilities” (2010: 8).

Using a formal model studying a politician’s decision to assign two missions to one or two agencies, I analyze the organizational tradeoff illustrated by these crises between managing competing goals and encouraging collaboration. Agencies tasked with multiple goals, which I refer to as multiple-mission agencies, face uncertainty regarding how to prioritize their activities. This well-documented issue, termed priority goal ambiguity, can be especially debilitating when the goals conflict (Chun and Rainey, 2005). In response, public administration scholars and practitioners often recommend that such organizations emphasize one goal over the others to alleviate the confusion that personnel face in navigating competing objectives (Shalala, 1998; Wilson, 1989). Still, if the agency emphasizes one goal, it neglects the other, which reduces social welfare and may be the goal political overseers more highly value.

Priority goal ambiguity manifests itself in the model through the agency’s uncertainty about the politician’s preferences. Although the politician values achievement of both goals, any partiality for one over the other is not fully communicated to the agency, either because she cannot or does not want to do so. This feature introduces goal ambiguity as envisioned by public administration scholars and makes the analysis the first to incorporate it into a formal model studying bureaucratic politics. The agency establishes a belief about which goal the politician values more and a level of confidence in that belief. In assigning both goals to one agency, the politician considers not only the possibility that the agency will misread her preference but also that the agency’s uncertainty over that preference may negatively affect its operations. No similar problem exists if the politician divides the goals because each agency faces a single mandate. Ambiguity is therefore an impetus to separate missions.
Yet, separating missions also has costs. The policy discussions after the crises show tasks performed to achieve competing goals might still need to be coordinated. This insight has not been considered in studies of goal ambiguity, perhaps because tasks are not often distinguished from goals. Considering this difference places a spotlight on the tension that exists between mitigating ambiguity and encouraging collaboration. By assigning both missions to one agency, the politician affords it the opportunity to coordinate execution of the tasks supporting the goals by sharing information and outputs. Coordination is modeled through the agency’s ability to move resources between missions, a possibility not available if the goals are separated.

The multiple-mission agency allocates the budget it receives using its belief about the politician’s preferences and its observation of the surrounding ecological, industry, and social environment. The probability a goal is attained is determined by how conducive the environment is to achieving it and the portion of the budget allocated to it. Although the politician has more information about her preferences, each agency also holds an informational advantage based on its unique ability to interpret how the environment will impact its capacity to achieve its assigned goal or goals. The asymmetry originates in the agency’s more extensive knowledge of its policy space, consistent with what is typically assumed in studies of bureaucracy.

I also allow for realizations of environmental conditions to affect the probability of attaining the goals in similar or dissimilar ways. In so doing, the model captures variation in the degree of discord between the goals, ranging from congruent, reflective of a positive correlation in how conditions affect whether each goal is attained, to conflicted, where the correlation is negative. The framework considers that the decision to combine goals may be contingent on how conflicted they are, an issue that has been overlooked in formal analyses of administrative design. One of the article’s advances is that it directly models this linkage.
Combining these elements, the research makes four primary contributions. The first two are general observations about the role organizational design plays in explaining bureaucratic behavior and performance. The second two are more specific observations about how the competing effects of goal ambiguity and coordination impact agencies depending on whether they manage multiple missions or not.

First, contrasting existing formal studies of related topics, the analysis points to a large area where combining missions is the best option. A politician’s desire to simultaneously achieve both goals increases the likelihood that a multiple-mission agency maximizes her utility. Such agencies are best positioned to utilize their knowledge of the policy space to shift resources between missions to achieve both goals concurrently. In fact, this advantage suggests that even when a goal is introduced through new legislation that somewhat conflicts with an agency’s existing missions, a politician may still optimally assign the goal to that agency, particularly if it is attentive to her preferences.

Second, organizational choices impact bureaucratic behavior even when the politician and agency agree on policy objectives. Because priority goal ambiguity is the impetus for dissonance between the politician’s will and the agency’s actions, the model does not require the agency’s preferences to diverge from those of its principal. Although a pillar of bureaucratic politics research is the assumption that civil servants and politicians have different objectives (Miller 2005), this article shows that administrative structures combining or separating missions have weaknesses that make it difficult for even faithful agencies to accomplish principals’ objectives.

Third, the model reveals that when priority goal ambiguity’s detrimental effects become more debilitating, the agency’s ability to coordinate becomes more indispensable. An agency combining missions offers the most value in terms of its capacity to share resources among them
when changing conditions affect the missions in relatively uncorrelated ways. Since it becomes more difficult to predict which goal or goals can be achieved, the agency’s ability to adjust after observing conditions is useful, an effect only tempered at negative correlations because the likelihood both goals can be achieved falls. Still, because goal discord worsens, priority goal ambiguity more severely impacts agency performance as conditions impact the goals in less positively correlated ways. Thus, ambiguity worsens as the importance of coordination intensifies. For this reason, policymakers might optimally hesitate before breaking up multiple-mission agencies based on the perception that goal ambiguity is a concern. They might also resist combining missions solely based on observed coordination failures when they are separated.

Fourth, when the multiple-mission agency is wrong about the politician’s preference, that politician can benefit from actually fueling the agency’s uncertainty to encourage it to more equally allocate resources to the missions. Because priority goal ambiguity aids politicians in this case, two types of multiple-mission agencies can be expected to emerge in equilibrium with little convergence between them. The first exhibits characteristics that public administration scholars attribute to strong organizations, wisely prioritizing among goals and acting with conviction to achieve objectives. In contrast, given their principals’ incentives to foster uncertainty among them, the second group will appear unfocused and tentative and show little ability over time to more precisely articulate their core purpose.

Goal Ambiguity, Compatibility, and Conflict

Public administration scholars have long held that the goals of public organizations are more ambiguous than those of their private counterparts (see Rainey and Jung (2015) for a literature review). As described by Worsham et al. (1997: 420), “Public policies commonly find their origins in legislation that defines objectives in broad terms…Bureaucrats then must give
ambiguous terms such as ‘the public interest’ substantive content; they must establish rules to translate vague mandates into enforcement actions.” Such ambiguity can derive from many sources, not the least of which is the limits politicians face in stating precisely what agencies should achieve. Unlike private organizations, agencies cannot often rely on markets to provide feedback to sharpen goals (Dahl and Lindblom, 1953; Niskanen, 1971). James Q. Wilson asserts that the goals of agencies “are unclear because reasonable people will differ as to the meaning of such words as ‘well-being,’ ‘potential,’ ‘security,’ ‘viable,’ ‘decent,’ ‘suitable,’ ‘welfare,’ ‘orderly,’ and ‘development.’” (1989: 33). Moreover, difficulties that exist in trying to state a single public goal precisely multiply when attempting to clearly communicate priorities to agencies assigned multiple goals, a condition referred to as priority goal ambiguity (Biber, 2009; Chun and Rainey, 2005).

Adding to the ambiguous language describing public goals and priorities, agencies can be tasked with vague goals because of the circumstances under which their guidance and directives are developed (Krause, 2009; Sabatier, 1999). As the literature studying policy implementation has shown, even if the agency answers directly to just one principal (as is assumed in this study), its statutory guidance is forged in an environment where many interests have a say, resulting in laws riddled with voids, errors, and conflicts (Lowi, 1979; Warwick et al., 1975). In fact, enacting the statute at all might require incorporating multiple, even conflicting, goals to ensure the support of various interests (Ring and Perry, 1985). Compounding the effects of political compromise, a myriad of issues arise in implementation that are difficult to foresee in advance (Bardach, 1977; Pressman and Wildavsky, 1984). Thus, generalist policymakers will not have the expertise to specify precisely what they want the agency to achieve, as appropriate interpretation and prioritization of goals will depend on the circumstances (Lindblom, 1959).
Politicians may also have electoral incentives to keep goals vague. Because policy pronouncements—relative to actual achievements—often drive votes, politicians may have little impetus to clearly spell out what they want the agency to achieve, even if they do care about the goals themselves (Edelman, 1967; Mayhew, 1974). Overly precise goals can incite certain interests and constituencies, prompting policymakers to keep goals general (Wildavsky, 1979). Noted management scholar Peter Drucker (1980: 105) writes, “It is ‘risky’ to spell out attainable, concrete, measurable goals…Furthermore, to set priorities seems even more dangerous.” While communicating partiality for one goal over the other can hurt a politician’s reelection chances, suggesting both are valued is likely to be much less controversial. As Wilson (1989: 33) explains, “even if [reasonable people] should agree on the meaning of one goal, they will disagree as to what other goals should be sacrificed to attain them.”

While goal ambiguity has been analyzed extensively by public administration scholars, existing studies do not formally model its effects on agency behavior. Information asymmetry certainly plays a central role in formal studies of bureaucracy (Gailmard and Patty, 2012), including those considering institutional design (Ashworth and Bueno de Mesquita, 2015; Ting, 2002, 2003). Still, in these studies, the source of asymmetry typically resides in the agent’s expertise or private information (Bendor and Meirowitz, 2004; Patty, 2009; Ting, 2008), with less emphasis on the case where the agency is at an informational disadvantage (but see Gailmard and Patty (2013a) for one exception). For example, Gailmard and Patty (2013b) consider how information agencies collect is filtered and shared with political principals. To counter the possibility that agencies may strategically reveal information, principals can use “stovepipes” to obtain information from other sources. Even Dewatripont, Jewitt, and Tirole (1999), who consider the effects of “fuzzy” missions, do so from the perspective of the
uncertainty it creates for overseers in determining upon which mission its agent is focused. In addition to incorporating agency expertise as many of these other studies do, the framework studied here uses goal ambiguity to also model the impacts of a politician’s private knowledge.

For this reason, this study departs from most formal research on bureaucracy which typically assumes to generate its results that preferences of the principal and agency deviate (Gailmard, 2002; Miller, 2005; Ting, 2011), including cases where the agency shirks its duties (Bueno de Mesquita and Stephenson, 2007; Strayhorn et al., 2015). By incorporating goal ambiguity, this model does not similarly require preferences to diverge. As a result, I assume the agency tries to maximize the politician’s utility. While assuming a faithful agent may appear limiting, a robust literature studying employee motivation has revealed that, among other drivers, personnel can be inspired by the agency’s mission (Bendor et al., 2001; Carpenter, 2001; Gailmard and Patty, 2007). Thus, the preferences of the principal and agency can be closely aligned.

By assuming a faithful agent, I am able to isolate how structure impacts the tradeoff in managing priority goal ambiguity while promoting underlying coordination. Although the agency implements the politician’s preferred mix when it has full knowledge of the principal’s payoffs, uncertainty about which goal the politician prefers makes implementation difficult. Thus, information rather than agency preferences drives the divergence between principal and agent. Comporting with the goal ambiguity literature, the fact that the politician’s preferences are not clearly communicated helps explain why agencies can perform inadequately.

To more realistically capture the connections between structure, goal ambiguity, and coordination, the model further incorporates the idea that ecological, industry, and social conditions can impact how easily goals are achieved in similar or opposing ways. In this manner,

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1 Turner’s (2017) study of ex-post review of agency decision-making represents one notable exception. While focused on different bureaucratic relationships, his approach mirrors this article in that he demonstrates review can impact agency implementation effort even when preference divergence is not a concern.
the analysis explicitly captures the empirical reality that the degree of discord between goals can vary, ranging from being in direct conflict to completely compatible. For example, increasing industry interest in deep water drilling in the mid-1990s pushed MMS to re-invent its regulatory approach, prompting the agency to collaborate with major producers to develop deep water standards (Carrigan 2014). Yet, what was an impediment to its regulatory group was a catalyst for MMS’s energy development and tax collection missions, “trigger[ing] record-breaking lease sales” and “billions of dollars in bonuses and rents” (MMS, 2004: 80). These relationships suggest that while MMS’s regulatory goals conflicted with those associated with its development and tax collection groups, the latter two groups’ goals were fairly harmonious.

Evidence that outside developments can affect goals similarly or differently—such that they end up being conflicted, compatible, or somewhere in between—can also be found in many other policy contexts. Wildfires have competing impacts on the US Forest Service’s duties to preserve wilderness, produce timber, and ensure visitor access to forest resources (Kaufman, 1960; Wilson, 1989). The former Immigration and Naturalization Service’s goal to deter illegal immigrants would be more difficult to achieve if conditions abroad made relocating to the US more appealing. Yet, encouraging the needed inflow of foreign agricultural workers would be easier (Manns 2002).

Despite its empirical relevance, little consideration has been given to how missions interact in models of bureaucratic structure. For example, to focus on how diverging policy preferences between the politician and agency impact the decision to assign two tasks to one or two agencies, Michael Ting assumes the functions are independent, thus enabling “the strategic aspect of task allocation to be studied in isolation of technological factors” (2002: 366). Similarly, although
Dewatripont et al. (1999, 2000) consider the correlation between the employee’s ability on two tasks, shocks affecting the performance of each are assumed to be independent.

This distinction at least partly explains why this study points to a greater role for multiple-mission agencies than other research formally modeling horizontal government structure. Ting (2002) shows that only when the politician prefers more intensive implementation of both missions than agency officials will that politician consider combining them. Dewatripont et al. (1999, 2000) find little reason to combine functions given that doing so weakens the principal’s ability to assess agency employee talent. Because Ting’s model, for example, assumes independent tasks, effort exerted on one cannot help achieve the other, something which might otherwise entice the politician to allocate both functions to one agency even if its preferences differ. Further, contrasting this study, the politician’s payoffs in Ting’s analysis are additively separable, such that the politician receives no added utility from achieving both simultaneously.\(^2\)

The Model

In the analysis that follows, the politician seeks to maximize her utility by choosing to assign two policy goals to one agency or two in a one period game. For convenience, I analyze the decision to combine or separate regulatory oversight and tax collection, analogous to the choice faced by Interior described at the outset. I adopt this frame simply to make the exposition easier, as the results apply to a broad set of policy contexts. The first goal, prevent an industry disaster, is represented as \(R\). The second goal, collect \$X\) billion in taxes, is \(T\).

As Figure 1 summarizes, the politician derives utility from the achievement of each goal individually and both goals jointly. Her payoff from success on \(R\) is either \(\alpha_H\) or \(\alpha_L\), where \(\alpha_H\) is

\(^2\) Interestingly, when they allow the agent’s ability on one task to positively correlate with the other, Dewatripont et al. (1999) find combining tasks is more attractive than it otherwise would be because more effort is exerted by the agent. The same is likely true if exogenous impacts on the tasks were also allowed to be correlated in their framework.
the high payoff and $\alpha_L$ is the low payoff, such that $0 < \alpha_L \leq \alpha_H$. Similarly, her payoff from success on $T$ is either $\alpha_H$ or $\alpha_L$. When the payoff for $R$ is $\alpha_H$, the payoff for $T$ is $\alpha_L$. In contrast, the politician receives $\alpha_H$ for $T$ when the payoff from achieving $R$ is $\alpha_L$. Because $\alpha_L \leq \alpha_H$, the politician can place equal value on preventing a disaster and collecting taxes. When both goals are achieved, the politician’s payoff is $\alpha_H + \alpha_L + \delta$. Thus, not only does the politician receive payoffs from success on each goal individually, she additionally receives $\delta$. By assuming $\delta > 0$, I ensure the politician’s utility from attaining both goals exceeds simply the sum of the utilities derived from achieving each individually. The fact that both goals are achieved has value for the politician. Finally, when neither goal is achieved, the politician’s payoff is $0$.

(Inser FIGURE 1 HERE)

Priority Goal Ambiguity

The model incorporates two forms of information asymmetry. The first originates in the politician’s payoffs. While the value of $\delta$ is common knowledge, which goal provides $\alpha_H$ to the politician and which provides $\alpha_L$ is known only to her. Thus, consistent with the goal ambiguity literature, the politician is not able to fully communicate her relative preference. As a result, while the agency would like to maximize the politician’s utility, it is at least initially uncertain about the politician’s preference over $R$ and $T$, which is the source of priority goal ambiguity in the model.

To characterize ambiguity in a straightforward way, I assign $P_R(\alpha = \alpha_i) = c$, where $i \in \{H, L\}$, to represent the agency’s confidence in its belief about the politician’s payoff to $R$. If the agency believes the politician prefers $R$ over $T$, $c$ represents the probability the agency assigns to its belief being correct that the payoff to $R$ is $\alpha_H$, represented as $P_R(\alpha = \alpha_H) = c$. Similarly, $c$ can be thought of as measuring how certain the agency is that its belief is accurate,
which is impacted by the precision of the imperfect signal it receives about the politician’s preference over the goals. As the goal ambiguity literature describes, the precision of that signal is determined by a variety of factors within and outside the politician’s control, including how clearly and comprehensively the statutes and other agency guidance can be worded. Of course, the signal the agency receives will not only influence its confidence but also whether the agency is fundamentally correct or incorrect about which goal the politician prefers.

In the case where $P_R(\alpha = \alpha_H) = c$, the probability the agency assigns to the possibility that the politician’s payoff to $R$ is $\alpha_L$ becomes $1 - c$ (i.e. $P_R(\alpha = \alpha_L) = 1 - c$). These beliefs and confidence levels define the probabilities the agency places on the politician’s payoffs for $T$ as well. If the probability the agency assigns to the politician more highly valuing $R$ is $c$, $c$ must also reflect the probability it places on her payoff to $T$ being $\alpha_L$. Thus, $P_T(\alpha = \alpha_L) = c$, and $P_T(\alpha = \alpha_H) = 1 - c$.

The other possibility is the agency believes the politician values $T$ more than $R$. In this case, the probabilities are reversed so $c$ represents the probability the agency assigns to being correct that the politician’s payoff to $R$ is $\alpha_L$, which is now represented as $P_R(\alpha = \alpha_L) = c$. Thus, $P_R(\alpha = \alpha_H) = 1 - c$. Because the probabilities for $R$ simultaneously define the probabilities for $T$, $P_T(\alpha = \alpha_H) = c$ and $P_T(\alpha = \alpha_L) = 1 - c$ in this alternative scenario.

Given the setup, $0.5 \leq c \leq 1$. If the agency places a probability of less than 0.5 on the possibility that the politician’s payoff to achieving $R$ is $\alpha_H$, it actually believes the payoff is $\alpha_L$. Priority goal ambiguity is therefore reflected in the agency’s uncertainty about whether the politician’s payoff from success on $R$ (and thus $T$) is $\alpha_H$ or $\alpha_L$. The intensity of that ambiguity is

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3 The agency’s confidence, $c$, could alternatively be interpreted as the probability the politician is a certain type, which mirrors the setup in many signaling models.
determined by the probability the agency places on its belief being correct, as measured by how far \( c \) is from one. \(^4\)

**Agency Expertise and Task Coordination**

The second source of information asymmetry derives from the assumption that the agency is more knowledgeable about its policy space than the politician. While an agency can assess how current ecological, industry, and social conditions will influence how effective it can be in achieving its goal or goals, the politician cannot. Thus, although the politician observes the agency’s belief regarding which goal she more highly values and its confidence in that belief, the agency still has private information given its unique understanding of its policy environment.

The impact of conditions on the agency’s ability to accomplish \( R \) and \( T \) is characterized by two Bernoulli random variables, \( \varphi \) and \( \tau \). The first measures the effect of the realization of conditions on an agency’s efforts to achieve \( R \), where \( \varphi \in \{0,1\} \). The second measures the impact of the same conditions on agency efforts to attain \( T \), where \( \tau \in \{0,1\} \). A value of one signifies conditions will help so \( P(\varphi = 1) \) and \( P(\tau = 1) \) represent the probabilities a realization will aid the agency’s achievement of \( R \) and \( T \) respectively. Because there is no reason to think these probabilities should differ (i.e. that an agency will have an easier or harder time preventing a disaster as opposed to collecting some specified amount of taxes), I assume \( P(\varphi = 1) = P(\tau = 1) = 0.5 \) to simply the exposition. Still, I demonstrate in the appendix that, while

\(^4\) In this way, the model captures the reality that the degree of goal ambiguity that agencies face can vary (Rainey and Jung, 2015). Still, the framework is less appropriate if the agency faces no ambiguity, which, although the public administration literature suggests is rare, is still a possibility. While that case is captured in the sense that the model allows for an agency to be certain about its accurate belief, as I describe below, a multiple-mission agency is always created so the framework is less illuminating.
complicating the analysis, allowing the probability to vary from 0.5 does not impact the character of the equilibria reached or the propositions.⁵

Although the probabilities are common knowledge, specific realizations of τ and φ are not. The agency knows the value of its respective random variable before acting, but the politician does not. Yet, an agency’s ability to observe τ and φ is conditional upon which mission or missions it is assigned. When the politician decides to allocate the missions to two agencies, the one assigned R observes only φ, and the other assigned T observes only τ. If, instead, the politician allocates both to one agency, that agency observes τ and φ.

Agencies also act to achieve R and T. Whereas r represents the amount of resources deployed to prevent disaster, t captures the resources employed to collect taxes. When the politician assigns the goals to separate agencies, she also determines r and t. If, instead, the politician delegates both missions to one agency, she presents it with a lump sum budget. The total budget is given and equal to one such that \( r + t \leq 1 \). Moreover, it is assumed that any resources not used to achieve R and T are consumed by the agency as slack, which is consistent with the empirical observation that agencies do not generally return appropriations to their political overseers (e.g. Niskanen, 1971; Wilson, 1989).⁶

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⁵ The intuition for why relaxing the constraint on \( P(\phi = 1) \) and \( P(\tau = 1) \) does not impact the equilibria derives from the fact that the probabilities are assumed to be common knowledge. Moreover, because the goals are determined by the politician, the assumption can be interpreted as simply suggesting she sets the degree of difficulty of obtaining the goals such that both have a 0.5 probability that conditions will be advantageous to achieving them. Given that the politician already chooses its preference over the goals, making this assumption has the added benefit of reducing the number of variables that measure her preference, as she could otherwise adjust the probabilities based on her preference over the goals.

⁶ This assumption is also consistent with related models of agency structure (Bueno de Mesquita and Stephenson, 2007; Ting, 2002). Still, allowing the agency to return its unused budget would have little impact. If the politician values using the budget to try to achieve the policy goals more than simply consuming it (which is a prerequisite for creating any agency), a faithful agency would only return an allocation when it cannot be used to achieve its goal or goals. Comparing the scenarios where the goals are combined to where they are separated, only when just one goal can be achieved will the behavior of the two sets of agencies differ. The agency which has both goals will funnel all resources to the goal which can be achieved while the single-mission agency whose goal cannot be achieved will return the budget. Given that the politician values trying to achieve the goal more than consuming the budget
Given this setup, unlike a single-mission agency, a multiple-mission agency decides on $r$ and $t$ after observing how conditions will affect its ability to achieve the goals. Certainly, the budgetary authority agencies receive limits their abilities to move resources between missions. Still, observation—including the examples demonstrating how interchangeable resources were at MMS and the Fed—and research supports the idea that agencies retain substantial ability to shift assets between missions (Ting 2002). The agency is thus able to coordinate execution of the tasks supporting even conflicted goals. For instance, during the aforementioned hearing analyzing the Fed’s structure, former chairmen Bernanke and Volcker described how the expertise acquired through the Fed’s role as central banker could be utilized to regulate financial institutions instead (Committee on Financial Services 2010). Similarly, data attained from the agency’s regulatory examinations was seen as vital to setting monetary policy properly. A principal advantage of a multiple-mission agency is its ability to coordinate execution of the goals by shifting between them fungible resources and outputs they create.

Combining the agency’s ability to interpret conditions with its role in implementing the budget, I denote the probability of preventing an industry disaster as $P(R = 1) = r\varphi$. Similarly, the probability of collecting $X$ billion in taxes is $P(T = 1) = t\tau$.

Goal Discord

To model the relationship in how goals are affected by ecological, industry, and social conditions, I represent the correlation between $\varphi$ and $\tau$ as $\text{Corr}(\varphi, \tau)$. In the appendix, I derive the set of joint probabilities for possible realizations of $\tau$ and $\varphi$. These probabilities in (1) indicate how the correlation impacts the probability any realization of conditions will affect the ability to achieve the goals in similar or dissimilar ways:

directly, the advantage that the multiple-mission agency offers in this regard does not differ from the analysis without allowing the agency to return the budget.
\[ P(\varphi = 1, \tau = 1) = P(\varphi = 0, \tau = 0) = \left( 1 + Corr(\varphi, \tau) \right) / 4 \]
\[ P(\varphi = 1, \tau = 0) = P(\varphi = 0, \tau = 1) = \left( 1 - Corr(\varphi, \tau) \right) / 4 \]

Thus, when \( Corr(\varphi, \tau) = 1 \), \( P(\varphi = 1, \tau = 1) = P(\varphi = 0, \tau = 0) = 1/2 \). Here, the goals are perfectly compatible given that the ability of the agency or agencies to achieve each goal is always affected the same way by conditions. When \( Corr(\varphi, \tau) = -1 \), \( P(\varphi = 1, \tau = 0) = 1/2 \), and \( P(\varphi = 0, \tau = 1) = 1/2 \), indicating that conditions always impact \( R \) and \( T \) in opposing ways, making the goals completely conflicted. Finally, when \( Corr(\varphi, \tau) = 0 \), each probability is \( 1/4 \) so knowing how conditions affect \( R \) does not help one predict how they will impact \( T \).

**Game Structure**

The game begins with the politician first deciding whether to consolidate or separate the goals, based in part on her knowledge of the agency’s belief about which goal she more highly values and its confidence in that belief. If the principal consolidates, she presents the entire budget to one agency. When the principal instead assigns the goals to two agencies, she chooses the fraction of the budget, \( r \), to allocate to \( R \) and the portion, \( t \), to allocate to \( T \). While the politician can choose to allocate less than the full budget, she will always fully assign it. This follows because the politician derives utility from achieving the goals, which becomes more likely when more resources are used to attain them.

The values of \( \varphi \) and \( \tau \) are then revealed to the agency or agencies. The agency observes both \( \varphi \) and \( \tau \) when the goals are consolidated. When the goals are separated, the agency assigned \( R \) observes \( \varphi \), and the agency assigned \( T \) observes \( \tau \). An agency allotted both goals next determines \( r \) and \( t \). Alternatively, if the missions are separated, the agency assigned \( R \) implements \( r \) as assigned by the politician, and the agency given \( T \) implements \( t \). Similar to the politician, agencies are not required to use their full allocations to achieve the goals but will
when they can positively impact the politician’s utility since they that is what they seek to maximize. Finally, success or failure on both goals is revealed where $P(R = 1) = r\varphi$ and $P(T = 1) = t\tau$, and the principal’s utility is computed.

**Expected Utility in Combining and Separating Missions**

To determine the factors that impact the politician’s utility given its design choice, I generate expressions for her expected utility when she combines and separates goals, which I then compare. The solution concept is perfect Bayesian equilibrium, and attention is limited to pure-strategy equilibria. Here, an equilibrium consists of strategies for the politician and agency that maximize the politician’s utility given the agency’s belief, including its confidence, over which goal the politician more highly values. The agency uses Bayes’ rule to update its belief and confidence (which is the probability it places on its belief being correct) where possible given the politician’s allocation decision. Proofs and derivations are presented in the appendix.

I focus first on the case where the politician allocates both goals to one agency. Despite the fact it is initially uncertain about which goal the politician prefers, under certain conditions, the agency can make this determination given the allocation it receives. Specifically, in a separating equilibrium where the politician derives greater utility from combining missions only when the agency is correct about her preference, the act of receiving $R$ and $T$ allows that agency to use Bayes’ rule to update the probability it assigns to its accurate belief to $c = 1$. In contrast, in a pooling equilibrium in which the politician is best combining the missions regardless of whether the agency is correct, in receiving both goals, the agency learns nothing about whether it is right or wrong. It does not update its confidence in its belief.

The act of assigning both goals to one agency thus yields two possibilities for whether that agency updates the probability it places on being correct. Regardless, the scenario where the
agency becomes certain it is correct represents a specific instance of the general case in which its confidence ranges. Thus, I compute the politician’s expected utility in the general case and use it to also compute utility in the specific instance where the agency is correct and $c = 1$.

Using the realizations of $\tau$ and $\varphi$, its knowledge of $\delta$, and its belief about whether $R$ or $T$ yields $\alpha_H$, the agency allocates the budget to maximize the politician’s utility. Because the agency observes $\tau$ and $\varphi$ before allocating resources, the probability of achieving $R$ is independent of the probability of achieving $T$ (except that the agency chooses how much of the budget to direct to each). The probabilities of combinations of success and failure on the goals become:

\[
P(R = 1, T = 1) = P(R = 1)P(T = 1) = (r\varphi)(\tau)
\]

\[
P(R = 1, T = 0) = P(R = 1) - P(R = 1, T = 1) = (r\varphi)(1 - \tau)
\]  

\[
P(R = 0, T = 1) = P(T = 1) - P(R = 1, T = 1) = (\tau)(1 - r\varphi)
\]  

where $P(R = 0, T = 0)$ is not computed since the principal’s utility is zero in that case.

Since it seeks to maximize the politician’s utility, the agency’s problem is:

\[
\max_{r, t} (r\varphi)(\tau)(\alpha_H + \alpha_L + \delta) + (r\varphi)(1 - \tau)\left(c\alpha_i + (1 - c)\alpha_j\right) + (\tau)(1 - r\varphi)\left(c\alpha_j + (1 - c)\alpha_i\right)
\]

s.t. $r + t = 1$

where the computed probabilities from (2) are inserted and expressions representing the agency’s uncertainty are substituted for the principal’s payoffs in Figure 1. For example, $c\alpha_i + (1 - c)\alpha_j$ reflects the agency’s best guess, incorporating its uncertainty, about whether the payoff to $R$ is $\alpha_H$ or $\alpha_L$, where $i \in \{H, L\}$, $j \in \{H, L\}$, and $i \neq j$. Similarly, $c\alpha_j + (1 - c)\alpha_i$ represents the agency’s corresponding best guess about the politician’s payoff to $T$. Each expression represents an average of the politician’s possible payoffs for achieving that goal, weighted based on the probability the agency assigns to its belief about whether the payoff is $\alpha_H$ or $\alpha_L$. If the agency
assigns a probability of \( c \) to the payoff to \( R \) being \( \alpha_H \), it is simultaneously assigning the same probability to the payoff to \( T \) being \( \alpha_L \). As a result, the payoff expressions differ only in the ordering of the subscripts, \( i \) and \( j \).

The politician’s expected utility derives from how the agency acts under the four possible combinations of \( \tau \) and \( \varphi \). When the agency observes \( \varphi = 1 \) and \( \tau = 0 \), its objective function in (3) simplifies to \( r(c \alpha_i + (1 - c)\alpha_j) \), yielding a corner solution whereby the agency allocates the entire budget to \( R \) (i.e. \( r^* = 1 \)). Here, \( P(R = 1, T = 0) = (r\varphi)(1 - \tau\tau) = 1 \), and the principal’s expected utility, \( EU_p(\varphi = 1, \tau = 0) \), is \( \alpha_H \) or \( \alpha_L \). When \( \varphi = 0 \) and \( \tau = 1 \), the agency maximizes \( t(c \alpha_j + (1 - c)\alpha_i) \). Thus, \( P(R = 0, T = 1) = 1 \) and so \( EU_p(\varphi = 0, \tau = 1) \) is \( \alpha_H \) or \( \alpha_L \) as well.

If \( \varphi = 0 \) and \( \tau = 0 \), the agency cannot achieve any goal so \( EU_p(\varphi = 0, \tau = 0) = 0 \).

Finally, when the agency observes \( \varphi = 1 \) and \( \tau = 1 \), its objective is \( rt\delta + r(c \alpha_i + (1 - c)\alpha_j) + t(c \alpha_j + (1 - c)\alpha_i) \), and its optimal allocations are \( r^* = \frac{1}{2} + \frac{(2c - 1)(\alpha_i - \alpha_j)}{2\delta} \) and \( t^* = \frac{1}{2} - \frac{(2c - 1)(\alpha_i - \alpha_j)}{2\delta} \) as a result.\(^7\) Substituting \( r^* \) and \( t^* \) into (2) and joining the resulting probabilities with the Figure 1 payoffs, the politician’s expected utility simplifies to:

\[
EU_p(\varphi = 1, \tau = 1) = \frac{\delta(2\alpha_m + 2\alpha_n + \delta) + \mu(2\alpha_m - 2\alpha_n - \mu)}{4\delta}
\]

where \( \mu(c, \alpha_i, \alpha_j) = (2c - 1)(\alpha_i - \alpha_j) \), and \( m \) and \( n \) reflect the politician’s preference for \( R \) or \( T \). Similar to \( i \) and \( j \), \( m \in \{H, L\} \), \( n \in \{H, L\} \), and \( m \neq n \). The difference between the sets of subscripts is simply that \( i \) and \( j \) represent the agency’s belief about which goal the politician

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\(^7\) Substituting for \( t \) or \( r \) in the agency’s objective function and taking the second derivative with respect to the other gives \(-2\delta \), which is negative for all \( \delta \). Thus, the second-order sufficient condition for a maximum is satisfied at \( r^* \) and \( t^* \). Moreover, given the non-negativity constraints on \( r \) and \( t \), the expressions for \( r^* \) and \( t^* \) yield the solution when \( \delta \geq |(2c - 1)(\alpha_i - \alpha_j)| \). In the appendix, I show this inequality is never more restrictive than a similar condition for an interior solution when the missions are separated. The article’s propositions are derived based on the stricter condition.
prefers, and \( m \) and \( n \) represent her actual preference. When the politician prefers \( R \) over \( T \), \( m = H \) and \( n = L \). Instead, when \( T \) is preferred to \( R \), \( m = L \) and \( n = H \). Thus, the agency’s belief matches the politician’s preference when \( i = m \), which means \( j = n \) as well.

Linking the expected utilities to the ex-ante probabilities in (1) for each combination of \( \varphi \) and \( \tau \) yields the following expression which summarizes the politician’s expected utility when she assigns both functions to one agency:

\[
EU_p(\varphi, \tau) = \frac{2\delta(3 - Corr(\varphi, \tau))(\alpha_m + \alpha_n) + \left(1 + Corr(\varphi, \tau)\right)(\delta^2 + \mu(2\alpha_m - 2\alpha_n - \mu))}{16\delta}
\]

where, again, \( \mu(c, \alpha_l, \alpha_j) = (2c - 1)(\alpha_l - \alpha_j) \), \( \alpha_l \) and \( \alpha_j \) reflect the agency’s belief, and \( \alpha_m \) and \( \alpha_n \) reflect the politician’s preference over \( R \) and \( T \) respectively.

Unlike when they are allocated to one agency, when the politician assigns \( R \) to one agency and \( T \) to another, she also decides how to allocate the budget among the goals. The agency tasked to prevent an industry disaster receives \( r \), and the agency selected to collect taxes receives \( t \). Because the agencies receive one goal each, uncertainty over the politician’s preference does not impact them. Priority goal ambiguity is therefore not a factor. The politician can simply solve for the optimal allocation, knowing the budget it assigns each agency will be fully utilized to achieve the goal when doing so can benefit her.

To determine the optimal allocation, I generate the probability distribution of success and failure on the two goals from the principal’s perspective. Because the politician does not observe \( \varphi \) or \( \tau \), the probability distribution, shown in Figure 2 and derived in the appendix, incorporates the correlation in how conditions affect the possibility of success on each goal.

(INSERT FIGURE 2 HERE)

Linking Figures 1 and 2, the politician’s problem is:
max \( \frac{r}{t} \rho (\alpha_m + \alpha_n + \delta) + \left( \frac{r}{2} - rt \rho \right) \alpha_m + \left( \frac{t}{2} - rt \rho \right) \alpha_n \) (5)

s.t. \( r + t = 1 \)

where \( \rho = (\text{Corr}(\varphi, \tau) + 1)/4 \). The first-order condition of expression (5) yields \( r^* = \frac{1}{2} + \frac{\alpha_m - \alpha_n}{\delta(\text{Corr}(\varphi, \tau) + 1)} \) and \( t^* = \frac{1}{2} - \frac{\alpha_m - \alpha_n}{\delta(\text{Corr}(\varphi, \tau) + 1)} \) as the principal’s optimal allocations.\(^8\) Substituting \( r^* \) and \( t^* \) into the politician’s maximand in (5), her expected utility from assigning the goals to two agencies simplifies to:

\[
EU_p(R + T) = \frac{(\text{Corr}(\varphi, \tau) + 1) \delta + 4(\alpha_m + \alpha_n)}{16} + \frac{(\alpha_m - \alpha_n)^2}{4\delta(\text{Corr}(\varphi, \tau) + 1)} \] (6)

where \( \alpha_m \) and \( \alpha_n \) represent the politician’s preference over \( R \) over \( T \) respectively.

Determinants of Organizational Design

To generate the propositions described in this section, the politician’s expected utility is computed when both goals are assigned to one agency relative to when they are divided. While the resulting expression is prepared from the standpoint of combining missions, this choice does not impact the results. Subtracting expression (6) from expression (4), the politician’s relative utility in combining as opposed to separating goals simplifies to:

\[
RU_p = \frac{2\delta (\alpha_m + \alpha_n) (1 - \text{Corr}(\varphi, \tau)^2) + (\text{Corr}(\varphi, \tau) + 1)^2 \mu (2\alpha_m - 2\alpha_n - \mu) - 4(\alpha_m - \alpha_n)^2}{16\delta(\text{Corr}(\varphi, \tau) + 1)} \] (7)

\(^8\) Substituting for \( r \) or \( t \), the second derivative of the principal’s maximand is \(-\delta(1 + \text{Corr}(\varphi, \tau))/2 \), which is always negative except when \( \text{Corr}(\varphi, \tau) = -1 \) where it is zero. Given that expressions for \( r^* \) and \( t^* \) are not defined when \( \text{Corr}(\varphi, \tau) = -1 \), this case represents a corner solution which can be safely ignored. Thus, the value of the objective function at \( r^* \) and \( t^* \) represents a maximum. Moreover, given the non-negativity constraints on \( r \) and \( t \), the expressions for \( r^* \) and \( t^* \) produce the solution when \( \delta(\text{Corr}(\varphi, \tau) + 1) \geq |2(\alpha_m - \alpha_n)| \). To generate the propositions, I concentrate on the range where the condition holds. Still, when it does not, the findings retain their essential features and, in many cases, are precisely replicated. Where they are not identical, they still support the intuition for the propositions described. Thus, focusing on the interior solution is not limiting.
Expression (7) characterizes the politician’s relative utility in a pooling equilibrium. In a separating equilibrium, expression (7) becomes:

\[ RU_p = \frac{2\delta(a_m + a_n)(1 - Corr(\varphi, \tau)^2) + ((Corr(\varphi, \tau) + 1)^2 - 4)(a_m - a_n)^2}{16\delta(Corr(\varphi, \tau) + 1)} \]  

(8)

which reflects the fact that the agency is correct and \( c = 1 \).

An important driver of whether the politician follows a pooling or separating strategy is the agency’s initial confidence in its belief. Holding the other parameters constant, a pooling equilibrium in which the politician always combines missions is more likely when \( c \) is relatively low. This insight is captured in Proposition 1.

**Proposition 1.** The politician chooses a pooling strategy where she allocates the goals to one agency regardless of whether that agency’s belief is correct \((i = m \text{ or } i \neq m)\) when:

\[ \frac{\delta(1 - Corr(\varphi, \tau))(a_m + a_n)}{\sqrt{2(Corr(\varphi, \tau) + 1)(a_m - a_n)^2 - (Corr(\varphi, \tau) + 1)^2}} + \frac{1}{4} \geq c \]  

(9)

Otherwise, she chooses a separating strategy in which she allocates both goals to one agency only when that agency is correct \((i = m \text{ only})\).

While the derivation of expression (9) is saved for the appendix, the intuition for it and Proposition 1 generally builds from considering four possibilities for the values of expression (7). First, when expression (7) is positive regardless of whether the agency is right (which is when inequality (9) is satisfied), the politician will always allocate both goals to one agency. Yet, because a multiple-mission agency is created regardless, it is not able to update its confidence in its belief about which goal the politician values more based on receiving both goals. In this
pooling equilibrium, expression (7) represents the politician’s relative utility in combining missions.9

Second, when expression (7) is positive if the agency is correct about the politician’s preference but negative when it is wrong (so inequality (9) is not satisfied), the politician will allocate both goals to one agency in the former case and to two agencies in the latter case.10 In this separating equilibrium, the politician’s choice enables the agency to update the probability it assigns to its belief using Bayes’ rule. If it receives both goals, the agency knows it must be correct because the politician would not have assigned it both goals otherwise so $c = 1$. Expression (8) therefore measures the politician’s relative utility when the agency is correct. Moreover, if the politician tried to allocate both goals to one agency when it is incorrect, the agency would believe it is right and increase the probability it places on its inaccurate belief, further reducing the politician’s utility.

A related possibility is that expression (7) is negative when the agency is correct but (8) is positive. Similar to the second, this third scenario results in a separating equilibrium where the politician assigns $R$ and $T$ to one agency only when its belief matches her preference. When it receives both goals, the agency knows it is right and updates $c$ to one. Expression (8) again reflects the politician’s relative payoff to combining goals when the agency is correct.

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9 While not applicable in a separating equilibrium since the politician’s two possible actions are on the equilibrium path, for this pooling equilibrium, the agency’s off the equilibrium path beliefs must also be specified to support a perfect Bayesian equilibrium. Off the equilibrium path here represents the situation where the politician assigns the goals to two agencies. When this occurs, the agencies learn which goal is preferred based on the allocation they receive. Still, such updating supports the pooling equilibrium. When the goals are separated, the agency’s choice to implement its allocation is unaffected by its belief about which goal the politician more highly values. Even if it is responsible for the less preferred goal, the politician still derives utility from achieving it, and so the agency implements its allocation when doing so can increase the politician’s utility. When expression (7) is positive, creating a multiple-mission agency is optimal for the politician, an outcome that is unaffected by whether the two agencies learn which goal the politician prefers. Thus, the politician has no reason to deviate by separating the goals.

10 I demonstrate in the proof of Proposition 1 that the value of expression (7) cannot be greater when the agency is wrong than when it is right. Therefore, the expression can be positive when the agency is correct and negative when it is wrong, but the converse is not possible.
In theory, another pooling equilibrium is possible whereby the goals are separated regardless of whether the agency’s belief is correct. Nevertheless, the bounds on the model’s parameters preclude this possibility, such that expression (8) is never negative. While the proof is in the appendix, the intuition follows from the fact that the key disadvantage to combining goals is the agency’s uncertainty over the politician’s preference. This is no longer a concern when the agency is fully confident about its accurate belief. At the same time, unlike when the goals are separated, the multiple-mission agency can reallocate resources in ways that benefit the politician after observing $\varphi$ and $\tau$. Thus, allocating both goals to one agency is often better but never worse for the politician when that agency is completely confident in its correct belief.

Summarizing, a pooling equilibrium in which the politician always assigns both goals to one agency occurs if inequality (7) is satisfied when the agency is wrong. Otherwise, the game results in a separating equilibrium, where both goals are only allocated to one agency when its belief is correct. Proposition 1 builds from this intuition to show that while the politician chooses to create a multiple-mission agency when its belief matches the politician’s preference, inequality (9), which is a reformulation of (7), defines the choice when the agency is wrong. When it is satisfied, a multiple-mission agency is best. If not, the politician is better separating the missions. Still, even a multiple-mission agency that is correct can be impacted by priority goal ambiguity. In a pooling equilibrium, the agency will be plagued by uncertainty even when its belief is accurate.

The proposition has at least two important implications for how agencies are designed. The first is that more than agency uncertainty or whether the goals accord or conflict, the politician’s choice to combine or separate missions is impacted by whether the agency is correct about her relative preference. If the agency is generally accurate in discerning its principal’s will, the
proposition predicts it will be a target for additional missions originating in new legislation or reassigned from other entities even when the associated goals do not completely mesh with the agency’s existing roles. An agency that has fostered a reputation for competence (Carpenter, 2001, 2010) may be asked to assimilate new assignments relative to creating fresh administrative structures. Martha Derthick’s (1990) classic study of the Social Security Administration (SSA) is one example. Because of its competence in servicing Social Security beneficiaries, Congress assigned SSA the task of evaluating disability claims even though the new role required very different competencies, creating turmoil at the agency.

The second insight is that the politician can benefit from a multiple-mission agency’s uncertainty in some situations. Inequality (9) is more apt to be satisfied such that the politician combines missions when the agency is wrong if that agency is less certain about its belief. Figure 3 supports this finding. It illustrates how the politician’s decision to combine or separate goals changes when the multiple-mission agency’s confidence in its inaccurate assessment also changes. The graph reveals that the region where the politician is better off combining goals shrinks as the agency becomes more convinced of its incorrect belief. Thus, political overseers may, in certain situations, have reason to cultivate uncertainty borne from priority goal ambiguity. Further, in a political environment which rationally resists an agency’s efforts to clarify its objectives, an uncertain multiple-mission agency will remain so.

(Figure 3)

Focusing specifically on the structure of expressions (7) and (8), I next analyze the determinants of the politician’s utility in combining relative to separating the goals. Propositions 2, 3, and the first half of 4 demonstrate the benefits that multiple-mission agencies bring through their ability to coordinate goal execution while the second half of proposition 4 and propositions 11 The parameter choices in Figures 3, 4, and 5 are arbitrary and do not affect the demonstrated relationships.
5 and 6 consider the costs that such agencies impose because of the ambiguity they are forced to manage. I focus first on proposition 2 which highlights the impact of changing $\delta$.

**Proposition 2.** The politician’s expected utility in combining relative to separating goals weakly increases as the additional payoff she derives from achieving both goals ($\delta$) increases.$^{12}$

Somewhat in tension with the goal ambiguity literature which emphasizes the problems introduced by combining goals, Proposition 2 provides a rationale for why multiple-mission agencies exist. Combined with Proposition 1, it also points to a broader role for such agencies than other formal studies of government administrative structure find. The politician’s partiality for achieving both goals means she will benefit when they are combined. In addition to personal preference, the politician’s desire for wanting to achieve both goals will depend on the characteristics of the policy space. If catastrophic consequences, such as a nuclear meltdown, might result from a failure on either goal, the politician might naturally emphasize achieving them concurrently. Similarly, and perhaps somewhat counterintuitively, Proposition 2 suggests multiple-mission agencies might be more apt to persist in environments where both goals are supported by influential interest groups. In these cases, a politician will derive much from simultaneous success on both such that assigning the goals to one agency will be more attractive.

The intuition for why the politician’s expected utility increases by creating a multiple-mission agency when she values both goals drives from the role such an agency can play in adjusting allocations. Because it observes $\varphi$ and $\tau$ before choosing $r$ and $t$, the agency can shift resources based on realizations of the random variables. When $\varphi = 1$ and $\tau = 1$, the agency allocates the budget more evenly to increase the probability that both goals will be achieved. In

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$^{12}$ I use “weakly” in the propositions to allow for the possibility that the variable of interest does not change. Stating that the politician’s utility weakly increases indicates that while utility typically increases and never decreases, it can stay the same in some (rare) circumstances.
contrast, if the missions are separated, not only do the agencies not observe both random
variables, they are also not able to coordinate resource allocations. In this case, the politician,
without observing $\varphi$ or $\tau$, must guard for the possibility that both goals cannot be achieved,
making separating the goals less attractive when $\delta$ is large.

Proposition 3 builds from Proposition 2 to further describe when the multiple-mission
agency’s ability to coordinate is most valuable.

**Proposition 3.** The gain in the politician’s relative expected utility from combining goals
achieved through the multiple-mission agency’s ability to coordinate mission execution
diminishes as $\varphi$ and $\tau$ become more negatively or positively correlated ($\text{Corr}(\varphi, \tau) \to -1$ or
$\text{Corr}(\varphi, \tau) \to 1$).

The proposition highlights the two opposing forces that jointly determine how much the
multiple-mission agency can increase the politician’s utility through its ability to adjust
allocations after observing conditions. When the goals are congruent such that conditions affect
them similarly, the politician can more easily determine the appropriate allocation herself. Here,
the agency’s ability to delay making a decision until $\varphi$ and $\tau$ are revealed does not help much.
As the correlation moves away from one because conditions begin to impact the goals in
unpredictable ways, the agency’s ability to make adjustments after observing conditions becomes
valuable. Still, opportunities for the agency to do so to achieve both goals diminish as the
correlation further declines, lessening the multiple-mission agency’s advantage at negative
correlations. Its ability to allocate resources to achieve both becomes less relevant.

The result is that the multiple-mission agency is most valuable to the politician when the
goals are neither strongly conflicted nor highly congruent. At moderate correlations, the
politician has little ability to predict how conditions are likely to affect the goals. Further,
opportunities for the agency to make adjustments to achieve both goals for the politician are still numerous, suggesting improved coordination can make a difference.

The relationship between Propositions 2 and 3 is illustrated in Figure 4. Focusing on the first and third terms of expression (7), the two lines in the top half of the figure eliminate goal ambiguity’s effects to illustrate how $\delta$ and $\text{Corr}(\varphi, \tau)$ interact to impact the gains the politician receives from combining purposes. As predicted by Proposition 2, the politician derives greater relative utility from combining goals when $\delta$ increases, by 50 percent from two to three in this case. Yet, consistent with Proposition 3, the gains are contingent on the correlation in how conditions affect each mission. The value a multiple-mission agency brings in shifting resources becomes less valuable as $\text{Corr}(\varphi, \tau)$ becomes strongly positive or negative.

(INSERT FIGURE 4 HERE)

As is true for the added payoff the politician receives when both goals are achieved, the politician’s preference over the goals has implications for her relative payoff in combining them.

**Proposition 4.** The politician’s expected utility from combining relative to separating goals weakly increases as the sum of her payoffs from achieving each goal individually (i.e. $\alpha_m + \alpha_n$) increases. In contrast, her expected utility weakly declines as the spread between those same payoffs (i.e. $|\alpha_m - \alpha_n|$) grows.

Because the politician receives the payoff for both goals only when they are achieved simultaneously, it is not surprising that the politician benefits from combining goals when the sum of $\alpha_H$ and $\alpha_L$ grows. The discussion surrounding Proposition 2 highlighted the multiple-mission agency’s special ability to coordinate allocations to each mission to provide the best chance of jointly achieving the goals. This advantage makes combining missions more attractive not only when $\delta$ is large but also when the sum of the two individual payoffs is large.
Of course, Proposition 4 also stresses the competing effect that when the spread between $\alpha_H$ and $\alpha_L$ increases, the payoff to assigning the goals to one agency falls. This is true irrespective of whether the multiple-mission agency’s beliefs match her preference. Thus, in combination, Proposition 4 reveals that when the payoff to the goal more valued by the politician grows, holding constant the payoff to the other, the impact on the politician’s relative utility is ambiguous. While $\alpha_H + \alpha_L$ grows, so does $\alpha_H - \alpha_L$. This tension is reflected in Figure 3. As the strength of the politician’s preference for one of the goals grows (reflected in $\alpha_H - \alpha_L$ increasing), so does her benefit in separating them. When $\alpha_H$ and $\alpha_L$ grow together (reflected in $\delta + \alpha_H + \alpha_L$ increasing), combining them at one agency becomes more attractive.

The former effect parallels Proposition 5 which emphasizes the role uncertainty, along with relative preferences, can play in neutralizing any advantage created by combining goals.

**Proposition 5.** Assume a pooling equilibrium exists such that inequality (9) is satisfied. When the agency’s belief matches the politician’s preference over the goals ($i = m$), the politician’s relative expected utility in combining goals weakly increases as the agency’s certainty in its belief grows ($c \to 1$). In contrast, when the agency’s belief is incorrect ($i \neq m$), the politician’s relative expected utility in combining goals weakly increases as the agency’s uncertainty about its inaccurate belief grows ($c \to 1/2$).

Propositions 4 and 5 collectively show that priority goal ambiguity can impact an agency through two channels, uncertainty and errors. Unlike a multiple-mission agency in a separating equilibrium or an agency assigned one goal, a multiple-mission agency in a pooling equilibrium does not learn which goal the politician favors through her allocation decision. Thus, the fact that Proposition 5 asserts the politician’s relative utility in combining goals is affected by uncertainty is logical, for priority goal ambiguity can only impede performance at multiple-mission agencies.
The propositions simultaneously reveal a channel by which uncertainty undermines performance. The goal ambiguity literature demonstrates that uncertainty introduced when agencies balance multiple objectives negatively impacts both individual employee and overall agency performance. Not only can ambiguity reduce morale by impeding management efforts to develop a core organizational purpose (Wilson, 1989; Wright, 2004), it promotes inefficient resource use and lowers employees’ intrinsic motivation (Locke and Latham, 1990). In the model, when the agency is uncertain about which goal the politician prefers, it hedges by choosing a more equal distribution of resources to guard against the possibility it is incorrect. This inefficient allocation is the source of the suboptimal performance of uncertain multiple-mission agencies. The effect is magnified when the politician is strongly partial to one goal since the agency’s tendency to equalize its distribution means its strays further from her preference.

As a result, efforts to boost the agency’s confidence in its belief when it is correct increase the politician’s utility in combining goals. The agency’s confidence might grow if the politician clarifies her preferences through more carefully worded statutes, oversight hearings, directives, or other mechanisms. These efforts may mean inequality (9) is no longer satisfied, such that the multiple-mission agency becomes certain so $c = 1$. Even if not, as $c$ increases, the agency hedges less, resulting in allocation decisions that more closely mirror the politician’s preference.

The second part of Proposition 4 shows that priority goal ambiguity is also detrimental because it creates the possibility the agency will focus on the goal that is less important to the politician. Balancing roles inappropriately is precisely what commentators on the Gulf oil spill and financial crisis claimed in declaring the associated agencies failed regulators. Focusing on the wrong goal is particularly problematic if the politician has a strong preference for the other. As $\alpha_H - \alpha_L$ increases, so does the damage the agency can do from concentrating on the wrong
goal. In fact, when the agency is incorrect, Proposition 5 indicates that uncertainty can benefit the politician. A multiple-mission agency less confident about its inaccurate belief shades its allocation to account for the possibility it is wrong. The more it shifts its allocation, the greater is the principal’s utility, a finding which points to a case where the politician will want to encourage ambiguity. The politician can foster uncertainty to persuade the agency to pursue its misinformed belief with less vigor.

The fact that the politician faces opposing incentives for sharing information depending on whether the agency’s belief is accurate implies two types of multiple-mission agencies are likely to exist. The first are high performers that are not only in step with their political overseers but also purposeful in their actions given their clarity on what they are asked to achieve. The second are poor performers that are unsure about their objectives and exhibit hesitancy in implementing their missions. Further, in equilibrium, these two agency types should show little convergence.

Like the benefits of coordination, priority goal ambiguity’s negative impact depends on whether the goals are congruent or conflicted.

**Proposition 6.** Assume a pooling equilibrium exists, and the agency’s belief matches the politician’s preference \( (i = m) \). The politician’s relative loss from combining goals in the presence of uncertainty \( (c < 1) \) weakly declines the more positively correlated are the effects of conditions on the probability of achieving those goals \( (Corr(\varphi, \tau) \to 1) \).

Because it focuses on the case where the agency is correct but uncertain about the politician’s preference, Proposition 6 considers the aspect of goal ambiguity most often contemplated in the literature: uncertainty’s impact on operations. When conditions typically impact the goals similarly, priority goal ambiguity has less effect. The bottom portion of Figure 4 reflects this insight. The figure shows the loss from goal ambiguity computed by eliminating the
first term from expression (7) to remove the gains a multiple-mission agency achieves through coordination. As Proposition 5 predicts, when the agency’s confidence in its accurate belief grows, in this case by 50 percent, combining goals becomes more attractive. Still, consistent with Proposition 6, Figure 4 demonstrates that the loss from uncertainty falls as the correlation between $\phi$ and $\tau$ approaches one. Multiple-mission agencies balancing congruent goals are less affected by goal ambiguity.

Like Propositions 4 and 5, the intuition for Proposition 6 begins with the fact that an agency facing uncertainty allocates resources more evenly to mitigate risk. Still, when $Corr(\phi, \tau)$ is more positive, the politician’s preferred assignment more closely tracks the uncertain agency’s choice, reducing the spread between them. With congruent goals, the probability both goals can be achieved simultaneously increases, and the politician desires to take advantage of this possibility through a more balanced allocation. For a given ambiguity level, the impact of the agency’s decision to more equally distribute resources is minimized. There is simply less damage a multiple-mission agency can do when goals are compatible.

Considering Proposition 6 in combination with Proposition 3 also suggests when administrative arrangements are likely to be more or less stable. In the case of congruent goals, the ability to coordinate is not all that valuable, but the impact of priority goal ambiguity is not especially problematic either. Whether the goals are combined or separated, the agencies are likely to show few signs of concern for political overseers in carrying out ongoing operations. In contrast, as they become more uncorrelated, goals divided among agencies are likely to show evidence of coordination failures, including turf wars, task neglect, and duplication, prompting politicians to want to combine them. Yet, this is precisely where multiple-mission agencies can begin to show outward failures induced by uncertainty stemming from priority goal ambiguity,
encouraging those same politicians to break up the agency. Particularly relative to environments characterized by congruent goals, organizational arrangements where goals are less correlated might be expected to oscillate between separating and combining missions over time, much like the history of Interior’s management of offshore oil and gas exploration reveals.

Discussion

This article began by recounting two disasters from the perspective of the policy debates they inspired. In both cases, commentators agreed that asking the associated agency to balance competing missions was a contributing factor. The analysis presented has attempted to shed light on the extent to which merging missions at or dividing them between government agencies affects behavior and performance. In the same way data and information gleaned through Fed bank examinations is used to set monetary policy appropriately and vice versa, Propositions 2 and 4 highlight how a multiple-mission agency’s ability to move resources between its missions can increase the probability both are achieved. At the same time, Propositions 4 and 5 comport with the goal ambiguity literature showing that the presence of competing goals fosters operational inefficiency, acting as an anchor on performance. The agency allocates resources in a suboptimal manner to buffer itself against the possibility it is incorrect, detraecting from the politician’s utility especially when she strongly favors one goal. Still, as Propositions 1 and 5 reveal, when that multiple-mission agency is wrong, fostering uncertainty can actually benefit the politician by encouraging the agency to adopt a balanced approach.

Moreover, broader ecological, industry, and social developments can intensify or mitigate the gains multiple-mission agencies achieve through task coordination and losses they absorb through goal ambiguity. Proposition 6 demonstrates priority goal ambiguity is less of an impediment when a strong positive correlation exists between how conditions affect each goal,
such that they are congruent. In contrast, Proposition 3 reveals that more moderate correlations where goals are neither completely conflicted nor fully harmonious are most conducive to achieving the greatest gains in merging them. Thus, whether the goals accord or conflict matters.

By describing how the tradeoff between coordination and ambiguity manifests itself, the propositions highlight the key point that when the existing structure exhibits outward manifestations of its weakness (breakdowns stemming from priority goal ambiguity when goals are combined and coordination failures when they are separated), the relative strengths of that same design are most helpful. For example, agencies managing goals less similarly affected by conditions can be expected to confront greater operational challenges from priority goal ambiguity. Yet, the prospect of breaking them up will not necessarily be attractive since these agencies can improve outcomes by shifting resources internally. Agencies assigned congruent goals will be less plagued by ambiguity, but the gains they achieve from coordination will be smaller. It is precisely when outward manifestations of goal ambiguity become more apparent that the importance of coordinating efforts is more critical.

These findings are summarized in Figure 5, which illustrates the relative gain to combining missions from 50 percent increases in \( c \) and \( \delta \) and a 50 percent decrease in the spread between \( \alpha_H \) and \( \alpha_L \). The figure shows that a politician’s payoff to combining relative to separating missions is greatest at moderate correlations, given this is where the agency’s ability to coordinate is most valued and uncertainty introduced by priority goal ambiguity is only starting have significant impacts. In contrast, when the goals are highly congruent or strongly conflicted, there is much less to gain in combining missions.

The figure also demonstrates how ideological shifts of political overseers and efforts to increase agency clarity affect government organization and performance. For example, a 50
percent increase in agency clarity can boost the politician’s payoff in combining missions, but the impact varies based on whether changes in environmental conditions similarly affect the missions. Unlike the relatively large gain the politician enjoys when the missions are analogously affected, increasing clarity has less ability to increase the payoff to merging goals when the correlation is close to zero or negative.

(INSERT FIGURE 5 HERE)

The story is different when considering changes in the politician’s ideological preferences. Although multiple-mission agencies are attractive when the politician more highly and similarly values both goals, they are less able to improve how the budget is distributed as the goals become more congruent. In contrast, the agency’s coordination ability after observing conditions can significantly increase the principal’s payoff at moderate correlations. As goals become more conflicted, opportunities to coordinate diminish, and ambiguity worsens which explains why combining goals is not attractive at strongly negative correlations. Still, as Figure 5 illustrates, even at moderately negative correlations, the payoff to combining missions can be quite large if political turnover or dramatic events bring a greater desire to achieve both goals or more balanced preferences (as represented by a smaller spread between $\alpha_H$ and $\alpha_L$).

Conclusion

In his State of the Union address eight months after announcing his administration’s decision to divide Interior’s management of oil and gas functions, President Obama noted the wastefulness of having that same department “in charge of salmon…in fresh water” while having the Commerce Department oversee “them…in saltwater.” Quipping that “it gets even more complicated once they’re smoked,” the President promised a plan to “merge, consolidate, and reorganize” government to increase efficiency (Obama, 2011).
Although President Obama’s State of the Union comments appear to be a direct rebuff of the type of reorganization he endorsed for the same department less than a year before in response to the Gulf spill, embedded in his competing announcements is the idea that optimally assigning government missions is not a one size fits all proposition. Functions can be haphazardly assigned to government entities (e.g. Pressman and Wildavsky, 1984), but good reasons for joining or separating missions may exist, even if they are not apparent given the dilemma at hand. This analysis has shown that as goal ambiguity becomes more likely to be newsworthy, coordinating resource allocations becomes more valuable. Thus, breaking up multiple-mission agencies or combining fragmented agencies may introduce equally large but previously hidden issues.

More broadly, this article has demonstrated one cannot predict how agencies will respond to political oversight without simultaneously considering their organizational structures. A politician’s choice to merge or separate goals can cause agency allocations to stray from her preferred mix without preferences of the agency and politician deviating. Thus, design decisions have ramifications that extend even to agencies faithful to their political overseers.

Further, the research has revealed a greater part to be played by multiple-mission agencies than existing formal models and the goal ambiguity literature suggest. The study provides a compelling rationale for why such agencies might be created, even knowing that commentators may later lament the goal ambiguity these decisions introduced. In fact, politicians may best assign a mission to an existing agency even if the associated goal does not accord with its current goals, assuming that agency has performed capably previously.

Finally, the results point to the possibility that a multiple-mission agency’s uncertainty can benefit the politician if that agency is apt to incorrectly interpret her preferences. Therefore, agencies unsure of their objectives initially may continue to remain so when politicians benefit
by keeping them “in the dark.” Two kinds of multiple-mission agencies may emerge with little convergence as a result: high performers which assess their politicians’ objectives accurately and act decisively given their clarity and low performers who act tentatively with little opportunity to clarify given their political overseers’ incentives.

Several opportunities exist for future research to extend this article’s insights. One possibility is to relax the assumption that agencies answer to one principal. As described, the presence of multiple principals is one of the many rationales for why multiple-mission agencies might be unclear about political preferences. Still, resulting competition between principals can also afford an agency greater leeway to follow its own objectives (Dixit, 1997; Gailmard, 2009). Introducing multiple principals thus offers a mechanism to analyze whether multiple-mission agencies are more amenable to oversight when their preferences diverge from political overseers. Whereas an agency focused on one goal might resist political attempts to dissuade it from stringently pursuing its objective, pressuring an agency balancing missions to emphasize one does not threaten its survival. Still, Ting (2002) shows that agency discretion expands when it pursues multiple goals since the principal is less able to acquire information about the organization’s activities. This suggests a potential tension in design between determining what the agency is doing and facing one less threatened by control.

More flexibly incorporating environmental conditions presents another opportunity to expand the analysis. Although the model assumes conditions are random draws from Bernoulli distributions, in reality, political actions can affect what circumstances the agency faces. The previously described impact on MMS of the oil and gas industry’s interest in deep water drilling was at least partially triggered by legislation temporarily exempting drillers from paying taxes on
deep water leases (Carrigan, 2014). This example suggests considering that politicians may drive the likelihood of particular conditions would deepen the analysis.

An associated avenue for inquiry would be to consider how the correlation between the impacts of conditions differs across mission types and over time. For example, regulatory goals might be more apt to conflict with others, making priority goal ambiguity more crippling but coordination more critical. Further, the evolution in political and social beliefs over time might drive perceptions about the correlations, furthering explaining why agency structures often vacillate in response to new developments, perpetuating a cycle of agency breakups and mergers. In sum, extending the model to more flexibly represent political oversight, agency preferences, and the external environment would not only yield more robust insights but could also reveal additional connections between the results and the broader literature on bureaucratic behavior.
Acknowledgements

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References


Figure 1 – The Politician’s Payoffs

<table>
<thead>
<tr>
<th>Prevent an Industry Disaster (R)</th>
<th>Collect $X$ Billion in Taxes (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success (1)</td>
<td>Failure (0)</td>
</tr>
<tr>
<td>$\alpha_H + \alpha_L + \delta$</td>
<td>$\alpha_H$ or $\alpha_L$</td>
</tr>
<tr>
<td>$\alpha_H$ or $\alpha_L$</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: The value in each box represents the politician’s payoff from that combination of success or failure on $R$ and $T$. When the payoff to $R$ is $\alpha_H$, the payoff to $T$ is $\alpha_L$, and vice versa.

Figure 2 – The Politician’s Joint Probability Distribution of Goal Success and Failure

<table>
<thead>
<tr>
<th>Prevent an Industry Disaster (R)</th>
<th>Collect $X$ Billion in Taxes (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success (1)</td>
<td>Failure (0)</td>
</tr>
<tr>
<td>$rt \left( \frac{\text{Corr}(\varphi, \tau) + 1}{4} \right)$</td>
<td>$\frac{r}{2} - rt \left( \frac{\text{Corr}(\varphi, \tau) + 1}{4} \right)$</td>
</tr>
<tr>
<td>$\frac{t}{2} - rt \left( \frac{\text{Corr}(\varphi, \tau) + 1}{4} \right)$</td>
<td>$1 - \frac{t}{2} - \frac{r}{2} + rt \left( \frac{\text{Corr}(\varphi, \tau) + 1}{4} \right)$</td>
</tr>
</tbody>
</table>

Note: Each box shows the probability, from the politician’s perspective, of that combination of success or failure on $R$ and $T$. 

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Figure 3 – The Choice to Separate or Combine Goals under Changing Agency Uncertainty

Note: The diagram displays the regions in which the politician receives greater utility from combining or separating goals depending on the strength of her relative preference over the goals and her payoff from joint goal success. The lines represent, for three agency confidence levels, those combinations of $\delta$, $\alpha_H$, and $\alpha_L$ where the politician is indifferent between combining and separating goals. The figure assumes the multiple-mission regulator is incorrect in its belief about which goal the politician prefers and sets $\text{Corr}(\varphi, \tau) = 0.5$ and $\alpha_L = 0.25$. 

Separate Goals

Combine Goals

Payoff from Joint Success on Goals ($\delta + \alpha_H + \alpha_L$)

Strength of Preference Over Goals ($\alpha_H - \alpha_L$)
Figure 4 – Disaggregating the Effects of Coordination and Ambiguity on the Politician’s Payoff

Note: The top two lines isolate the politician’s gain from agency coordination at two values of \( \delta \) by removing the effects of goal ambiguity from the computation of the politician’s relative payoff. The bottom two lines isolate the loss from priority goal ambiguity at two values of \( c \) by removing the coordination gains from combining missions. The figure assumes the multiple-mission agency is correct but uncertain in its belief about which goal the politician prefers and sets \( \alpha_L = 0.2 \) and \( \alpha_H = 1.0 \).
Figure 5 – How Changing Political Preferences and Agency Clarity Impact the Relative Payoff to Combining Missions

Note: The diagram displays the impacts on the politician’s relative payoff in combining goals for 50 percent increases in $\delta$ and $c$ as well as a 50 percent decrease in $\alpha_H - \alpha_L$, where $\alpha_H = 1.0$ and $\alpha_L = 0.2$ initially. The figure assumes the multiple-mission agency is correct in its belief about which goal the politician prefers.
Appendix

*Derivation of Probabilities in (1).* To show that \( P(\varphi = 1, \tau = 1) = P(\varphi = 0, \tau = 0) = (1 + \text{Corr}(\varphi, \tau))/4 \) and \( P(\varphi = 1, \tau = 0) = P(\varphi = 0, \tau = 1) = (1 - \text{Corr}(\varphi, \tau))/4 \), I begin with the definition of covariance for discrete random variables:

\[
\text{Cov}(\varphi, \tau) = \sum_{\varphi} \sum_{\tau} \varphi \tau P(\varphi, \tau) - \mu_\varphi \mu_\tau
\]

\( P(\varphi, \tau) \) represents the probability of a given realization of \( \varphi \) and \( \tau \) and \( \mu_\varphi \) and \( \mu_\tau \) represent the mean of \( \varphi \) and \( \tau \) respectively. When either \( \varphi = 0 \) or \( \tau = 0 \), \( \varphi \tau P(\varphi, \tau) = 0 \). Because both \( \varphi \) and \( \tau \) are Bernoulli random variables, and it is assumed that \( P(\varphi = 1) = P(\tau = 1) = 1/2, \mu_\varphi = 1/2 \) and \( \mu_\tau = 1/2 \). Substituting into the expression for covariance gives \( \text{Cov}(\varphi, \tau) = (1)(1)P(\varphi = 1, \tau = 1) - 1/4 \) or \( P(\varphi = 1, \tau = 1) = \text{Cov}(\varphi, \tau) + 1/4 \).

Because both random variables are Bernoulli, \( \text{Var}(\varphi) = (1/2)(1 - 1/2) = 1/4 \), and \( \text{Var}(\tau) = (1/2)(1 - 1/2) = 1/4 \). By the definition of correlation,

\[
\text{Corr}(\varphi, \tau) = \frac{\text{Cov}(\varphi, \tau)}{\sqrt{\text{Var}(\varphi)\text{Var}(\tau)}}
\]

Substituting for the variance of both random variables, \( \text{Cov}(\varphi, \tau) = \text{Corr}(\varphi, \tau)/4 \). Thus, the expression for \( P(\varphi = 1, \tau = 1) \) can be rewritten as \( P(\varphi = 1, \tau = 1) = (1 + \text{Corr}(\varphi, \tau))/4 \). Employing the properties of probability, the other three possibilities are:

\[
P(\varphi = 1, \tau = 0) = P(\varphi = 1) - P(\varphi = 1, \tau = 1) = \frac{1}{2} - \frac{1 + \text{Corr}(\varphi, \tau)}{4} = \frac{1 - \text{Corr}(\varphi, \tau)}{4}
\]

\[
P(\varphi = 0, \tau = 1) = P(\tau = 1) - P(\varphi = 1, \tau = 1) = \frac{1}{2} - \frac{1 + \text{Corr}(\varphi, \tau)}{4} = \frac{1 - \text{Corr}(\varphi, \tau)}{4}
\]

\[
P(\varphi = 0, \tau = 0) = P(\varphi = 0) - P(\varphi = 0, \tau = 1) = \frac{1}{2} - \frac{1 - \text{Corr}(\varphi, \tau)}{4} = \frac{1 + \text{Corr}(\varphi, \tau)}{4}
\]

Thus, \( P(\varphi = 1, \tau = 1) = P(\varphi = 0, \tau = 0) = (1 + \text{Corr}(\varphi, \tau))/4 \), and \( P(\varphi = 1, \tau = 0) = P(\varphi = 0, \tau = 1) = (1 - \text{Corr}(\varphi, \tau))/4 \).

*Derivation of Probabilities in Figure 2.* A first step to derive the probabilities in Figure 2 is to show \( R = 1 \) and \( T = 1 \) is only feasible when \( \varphi = 1 \) and \( \tau = 1 \). By definition, \( P(R = 1) = r \varphi \) and \( \varphi \in \{0,1\} \). Thus, \( P(R = 1|\varphi = 1) = r \), and \( P(R = 1|\varphi = 0) = 0 \). Similarly, \( P(T = 1) = t \tau \) and \( \tau \in \{0,1\} \) and so \( P(T = 1|\tau = 1) = t \) and \( P(T = 1|\tau = 0) = 0 \). Because \( P(R = 1, T = 1) > 0 \) only when \( P(R = 1) > 0 \) and \( P(T = 1) > 0 \), and \( P(R = 1) > 0 \) and \( P(T = 1) > 0 \) only when \( \varphi = 1 \) and \( \tau = 1 \), \( R = 1 \) and \( T = 1 \) is only feasible when \( \varphi = 1 \) and \( \tau = 1 \).

I next show \( P(R = 1, T = 1|\varphi = 1, \tau = 1) = rt \). By definition, \( P(R = 1|\varphi = 1) \) and \( P(T = 1|\tau = 1) \) are independent after \( \varphi \) and \( \tau \) are observed. By the definition of independence and substituting for \( P(R = 1|\varphi = 1) \) and \( P(T = 1|\tau = 1) \), \( P(R = 1, T = 1|\varphi = 1, \tau = 1) = P(R = 1|\varphi = 1)P(T = 1|\tau = 1) = rt \).

The Figure 2 probabilities are given from the politician’s perspective and so are generated without knowledge of \( \varphi \) and \( \tau \). To compute them, I employ the multiplication rule of probabilities where \( P(R = 1, T = 1) = P(R = 1, T = 1|\varphi = 1, \tau = 1)P(\varphi = 1, \tau = 1) \). This follows because \( P(R = 1, T = 1) = P(R = 1, T = 1 \& \varphi = 1, \tau = 1) \), as \( R = 1 \) and \( T = 1 \) is only possible when \( \varphi = 1 \) and \( \tau = 1 \). Because \( P(\varphi = 1, \tau = 1) = (\text{Corr}(\varphi, \tau) + 1)/4 \) from (1), and \( P(R = 1, T = 1|\varphi = 1, \tau = 1) = rt \), \( P(R = 1, T = 1) = rt (\text{Corr}(\varphi, \tau) + 1)/4 \).
Since $R$ and $T$ are Bernoulli random variables, $P(R = 1) = E(R)$ where $E(R)$ is the expected value of $R$. By the definition of expected value, $E(R) = E(R|\varphi = 1)P(\varphi = 1) + E(R|\varphi = 0)P(\varphi = 0)$. Moreover, as Bernoulli random variables, $E(R|\varphi = 1) = P(R = 1|\varphi = 1)$ and $E(R|\varphi = 0) = P(R = 1|\varphi = 0)$. Given that $P(\varphi = 1) = P(\varphi = 0) = 1/2$, and substituting for $P(R = 1|\varphi = 1)$ and $P(R = 1|\varphi = 0)$, $E(R)$ simplifies to $E(R) = r/2$. Thus, from the politician’s perspective, $P(R = 1) = r/2$. Applying the same steps, one can show $P(T = 1) = t/2$. The probabilities for the other combinations of $R$ and $T$ become:

\[
P(R = 1, T = 0) = P(R = 1) - P(R = 1, T = 1) = \frac{r}{2} - rt \left( \frac{Corr(\varphi, \tau) + 1}{4} \right)\]

\[
P(R = 0, T = 1) = P(T = 1) - P(R = 1, T = 1) = \frac{t}{2} - rt \left( \frac{Corr(\varphi, \tau) + 1}{4} \right)\]

\[
P(R = 0, T = 0) = P(T = 0) - P(R = 1, T = 0) = 1 - \frac{t}{2} + \frac{r}{2} + rt \left( \frac{Corr(\varphi, \tau) + 1}{4} \right)\]

which completes Figure 2.

\[\square\]

**Derivation of Conditions for Interior Solution.** This derivation has three parts. First, I show that when the politician allocates both missions to one agency, and that agency observes $\varphi = 1$ and $\tau = 1$, $0 \leq r^*, t^* \leq 1$ when $\left| (2c - 1)(\alpha_i - \alpha_j) \right| \leq \delta$. Second, I show that when the politician separates the missions, she will allocate the budget such that $0 \leq r^*, t^* \leq 1$ when $\left| (2(\alpha_m - \alpha_n)) \right| \leq \delta(Corr(\varphi, \tau) + 1)$. Third, I show that $\left| (2(\alpha_m - \alpha_n)) \right| \leq \delta(Corr(\varphi, \tau) + 1)$ is always at least as restrictive as $\left| (2c - 1)(\alpha_i - \alpha_j) \right| \leq \delta$.

When the missions are combined, and agency $RT$ observes $\varphi = 1$ and $\tau = 1$, $r^* = \frac{1}{2} + \frac{(2c-1)(\alpha_i-\alpha_j)}{2\delta}$ and $t^* = \frac{1}{2} - \frac{(2c-1)(\alpha_i-\alpha_j)}{2\delta}$. However, the two expressions only apply when $r^*, t^* \geq 0$. In contrast, the solution is $r = 0$ when $r^* < 0$, and $t = 0$ when $t^* < 0$. Thus, the expressions for the optimal allocations apply when $\frac{1}{2} + \frac{(2c-1)(\alpha_i-\alpha_j)}{2\delta} \geq 0$ and $\frac{1}{2} - \frac{(2c-1)(\alpha_i-\alpha_j)}{2\delta} \geq 0$.

When the missions are separated, the politician’s optimal allocation is given as $r^* = \frac{1}{2} + \frac{\alpha_m - \alpha_n}{\delta(Corr(\varphi, \tau) + 1)}$ and $t^* = \frac{1}{2} - \frac{\alpha_m - \alpha_n}{\delta(Corr(\varphi, \tau) + 1)}$. The two expressions only apply when $r^*, t^* \geq 0$ and so $\frac{1}{2} + \frac{\alpha_m - \alpha_n}{\delta(Corr(\varphi, \tau) + 1)} \geq 0$ and $\frac{1}{2} - \frac{\alpha_m - \alpha_n}{\delta(Corr(\varphi, \tau) + 1)} \geq 0$. Rearranging the first expression yields $2(\alpha_m - \alpha_n) \geq \delta(Corr(\varphi, \tau) + 1)$ and the second yields $\delta(Corr(\varphi, \tau) + 1) \geq 2(\alpha_m - \alpha_n)$. Combining them, we have that $\delta(Corr(\varphi, \tau) + 1) \geq |2(\alpha_m - \alpha_n)|$.

To show $\delta(Corr(\varphi, \tau) + 1) \geq 2|\alpha_m - \alpha_n|$ is as always at least as restrictive as $\delta \geq |2(2c - 1)(\alpha_i - \alpha_j)|$, I rewrite the first inequality as $\delta \geq 2|\alpha_m - \alpha_n|/(Corr(\varphi, \tau) + 1)$. The first inequality is at least as restrictive as the second if $2|\alpha_m - \alpha_n|/(Corr(\varphi, \tau) + 1) \geq (2c - 1)|\alpha_i - \alpha_j|$. Because $|\alpha_m - \alpha_n| = |\alpha_i - \alpha_j|$, the inequality simplifies to $2/(Corr(\varphi, \tau) + 1) \geq (2c - 1)$ or $2 \geq (2c - 1)(Corr(\varphi, \tau) + 1)$. Since $1 \geq c$ and $1 \geq Corr(\varphi, \tau)$, the weak inequality is always satisfied.
Therefore, \( \delta(Corr(\varphi, \tau) + 1) \geq |2(\alpha_m - \alpha_n)| \) is as always at least as restrictive as \( \delta \geq \frac{|(2c - 1)(a_i - a_j)|}{|2(\alpha_m - \alpha_n)|} \).

**Proof of Proposition 1.** This proof has three parts. First, I show that the value of expression (7) cannot be simultaneously positive when the agency is wrong and negative when it is correct. Second, I show that a pooling equilibrium exists in which both goals are assigned to one agency regardless of whether it is correct when inequality (9) is satisfied. Finally, I show that expression (8) is never negative, precluding the possibility of a pooling equilibrium where the goals are separated even when the agency is right about which goal the politician prefers.

For expression (7) to be positive when the agency is wrong and negative when it is right, it must be possible for the value of that expression when the agency is wrong to exceed its value when the agency is right. Thus, the first part of the proof involves demonstrating that expression (7) can never be larger when the agency is wrong. To do so, I show that the difference when the agency is correct relative when it is wrong is always at least zero.

When the agency accurately assesses the politician’s preference, \( i = m \) and so \( \mu = (2c - 1)(\alpha_m - \alpha_n) \). In contrast, when the agency is wrong, \( \mu = (2c - 1)(\alpha_n - \alpha_m) \). Substituting the appropriate expression for \( \mu \) and subtracting expression (7) when the agency is wrong from the expression when it is correct gives:

\[
RU_p(\text{correct}) - RU_p(\text{incorrect}) = \frac{4(Corr(\varphi, \tau) + 1)^2(2c - 1)(\alpha_m - \alpha_n)^2}{16\delta(Corr(\varphi, \tau) + 1)}
\]

Because \( Corr(\varphi, \tau) \geq -1 \), \( c \geq 1/2 \), and \( \delta > 0 \), \( RU_p(\text{correct}) - RU_p(\text{incorrect}) \geq 0 \) unless \( Corr(\varphi, \tau) = -1 \), in which case it is undefined. Thus, the value of expression (7) cannot be positive when the agency is wrong but negative when it is correct.

For a pooling equilibrium to exist where the politician combines goals regardless of whether the agency is correct, it must be that expression (7) is at least zero when the agency is incorrect about which goal the politician prefers. Thus, it must be that:

\[
\begin{align*}
2\delta(\alpha_m + \alpha_n)(1 - Corr(\varphi, \tau)^2) + (Corr(\varphi, \tau) + 1)^2(2\alpha_m - 2\alpha_n - \mu) - 4(\alpha_m - \alpha_n)^2 &\geq 0 \\
2\delta(\alpha_m + \alpha_n)(1 - Corr(\varphi, \tau)^2) + ((Corr(\varphi, \tau) + 1)^2 - 4)(\alpha_m - \alpha_n)^2 &\geq c^2
\end{align*}
\]

which simplifies to:

\[
\sqrt{\frac{\delta(1 - Corr(\varphi, \tau))(\alpha_m + \alpha_n)}{2(Corr(\varphi, \tau) + 1)(\alpha_m - \alpha_n)^2}} - \frac{1}{(Corr(\varphi, \tau) + 1)^2} + \frac{1}{4} \geq c
\]

Thus, a pooling equilibrium exists when expression (9) is satisfied.

Finally, I demonstrate that expression (8) is never negative, which means that no pooling equilibrium exists where the goals are separated even when the agency is correct about the politician’s preference. As demonstrated above, the analysis assumes an interior solution exists, such that \( \delta(Corr(\varphi, \tau) + 1) \geq |2(\alpha_m - \alpha_n)| \). Isolating \( \delta \), the inequality becomes \( \delta \geq 2|\alpha_m - \alpha_n|/(Corr(\varphi, \tau) + 1) \). When \( \delta \) takes the smallest relative value it can, \( \delta = 2|\alpha_m - \alpha_n|/(Corr(\varphi, \tau) + 1) \). Given that the numerator of expression (8) is least likely to be positive when \( \delta \) is as small as possible, if expression (8) is still greater than or equal to zero when \( \delta = 2|\alpha_m - \alpha_n|/(Corr(\varphi, \tau) + 1) \), it is always greater than or equal to zero.

Substituting for \( \delta \), the numerator of expression (8) becomes:
Because which simplifies to $\frac{2|\alpha_m - \alpha_n|}{\text{Corr}(\varphi, \tau) + 1}(\alpha_m + \alpha_n)(1 - \text{Corr}(\varphi, \tau)^2) + ((\text{Corr}(\varphi, \tau) + 1)^2 - 4)(\alpha_m - \alpha_n)^2$
The first term of the simplified expression is always positive, and the second term is always negative unless $\text{Corr}(\varphi, \tau) = 1$ or $\alpha_m = \alpha_n$ (in which case both terms are zero). Moreover, because $|\alpha_m - \alpha_n|(|\alpha_m + \alpha_n| \geq (\alpha_m - \alpha_n)^2$, setting $|\alpha_m - \alpha_n|(|\alpha_m + \alpha_n|$ and $(\alpha_m - \alpha_n)^2$ equal makes the expression as small as possible. Again, if the expression is at least zero when $|\alpha_m - \alpha_n|(|\alpha_m + \alpha_n| is as small as possible, it is always greater than or equal to zero. Substituting $(\alpha_m - \alpha_n)^2$ for $|\alpha_m - \alpha_n|(|\alpha_m + \alpha_n|$, the expression simplifies to $(\text{Corr}(\varphi, \tau) - 1)^2(\alpha_m - \alpha_n)^2$, which is always greater than or equal to zero. Thus, expression (9) is never negative so no pooling equilibrium exists in which the politician separates the goals even when agency is correct about the politician’s preference. 

Proof of Proposition 2. Assume $\delta$ increases to $\delta + \epsilon$, where $\epsilon > 0$. Subtracting the politician’s relative utility in combining missions using expression (7) when her payoff for joint success is $\delta$ from her relative utility when $\delta$ increases to $\delta + \epsilon$ gives:

$$RU_p(\delta + \epsilon) - RU_p(\delta) = \Delta RU_p = \frac{4(\alpha_m - \alpha_n)^2\epsilon - \text{Corr}(\varphi, \tau) + 1)2(2\alpha_m - 2\alpha_n - \mu)\epsilon}{16\delta(\delta + \epsilon)(\text{Corr}(\varphi, \tau) + 1)}$$

Because $4\epsilon \geq (\text{Corr}(\varphi, \tau) + 1)^2\epsilon$, $\Delta RU_p \geq 0$ if $(\alpha_m - \alpha_n)^2 - \mu(2\alpha_m - 2\alpha_n - \mu) \geq 0$. The first case is where the agency is correct, such that $\mu = (2c - 1)(\alpha_n - \alpha_m)$. Substituting for $\mu$, $(\alpha_m - \alpha_n)^2 - \mu(2\alpha_m - 2\alpha_n - \mu)$ simplifies to $(1 - c)^2$, which is always at least zero given that $1/2 \leq c \leq 1$. Moreover, only when the goals are completely congruent (i.e. $\text{Corr}(\varphi, \tau) = 1$), and the agency is fully confident in its accurate belief (i.e. $c = 1$ and $i = m$) or when uncertainty is irrelevant (i.e. $\alpha_m = \alpha_n$) does $\Delta RU_p = 0$, where changing $\delta$ has no effect on $RU_p$. The second case is where the agency is incorrect, such that $\mu = (2c - 1)(\alpha_n - \alpha_m)$. When this is true, $(\alpha_m - \alpha_n)^2 - \mu(2\alpha_m - 2\alpha_n - \mu)$ simplifies to $c^2$, which is always greater than zero. Further, only when $\alpha_m = \alpha_n$ does $\Delta RU_p = 0$. Given that $\Delta RU_p \geq 0$ regardless of whether the agency is correct about the politician’s preference, the politician’s payoff to combining missions weakly increases when $\delta$ increases to $\delta + \epsilon$.

When expression (8) describes the politician’s relative utility in combining goals, the difference between the expression when the payoff to joint success is $\delta + \epsilon$ and $\delta$ simplifies to:

$$RU_p(\delta + \epsilon) - RU_p(\delta) = \Delta RU_p = \frac{-\epsilon((\text{Corr}(\varphi, \tau) + 1)^2 - 4)(\alpha_m - \alpha_n)^2}{16\delta(\delta + \epsilon)(\text{Corr}(\varphi, \tau) + 1)}$$

The denominator of the expression is always positive, and the numerator is always positive unless $\text{Corr}(\varphi, \tau) = 1$ or $\alpha_m = \alpha_n$, in which case $\Delta RU_p = 0$. Thus, $\Delta RU_p \geq 0$ when $\delta$ increases to $\delta + \epsilon$. Because $\Delta RU_p \geq 0$ regardless of whether expression (7) or (8) describes the politician’s payoff, the politician’s relative payoff to combining missions weakly increases when $\delta$ increases to $\delta + \epsilon$, proving Proposition 2. 

Proof of Proposition 3. To show that the gain in the politician’s relative expected utility from combining goals achieved through coordination diminishes as $\text{Corr}(\varphi, \tau) \to -1$ or $\text{Corr}(\varphi, \tau) \to 1$, I focus on the first and third terms of the numerator of expression (7), thereby
eliminating the negative impact of goal ambiguity. Removing the second term in the numerator and taking the partial derivative with respect to $\text{Corr}(\phi, \tau)$ gives:

$$\frac{\partial R(U)\text{(no ambiguity)}}{\partial \text{Corr}(\phi, \tau)} = \frac{-(\alpha_m + \alpha_n)}{8} + \frac{(\alpha_m - \alpha_n)^2}{4\delta(\text{Corr}(\phi, \tau) + 1)^2}$$

The first term of the expression is negative, and the second term is positive. When $(\alpha_m - \alpha_n)^2/4\delta(\text{Corr}(\phi, \tau) + 1)^2 > (\alpha_m + \alpha_n)/8$, increasing $\text{Corr}(\phi, \tau)$ increases $R(U)\text{(no ambiguity)}$. Fixing $\delta, \alpha_m$, and $\alpha_n$, when $\text{Corr}(\phi, \tau) \approx -1$, the denominator of the second term becomes very small, such that the term is strongly positive. Thus, $\frac{\partial R(U)\text{(no ambiguity)}}{\partial \text{Corr}(\phi, \tau)} > 0$ when $\text{Corr}(\phi, \tau) \approx -1$. Here, increasing $\text{Corr}(\phi, \tau)$ increases the gains realized by combining missions achieved through coordination.

In contrast, when $(\alpha_m + \alpha_n)/8 > (\alpha_m - \alpha_n)^2/4\delta(\text{Corr}(\phi, \tau) + 1)^2$, increasing $\text{Corr}(\phi, \tau)$ decreases $R(U)\text{(no ambiguity)}$. To show $\frac{\partial R(U)\text{(no ambiguity)}}{\partial \text{Corr}(\phi, \tau)} < 0$ when $\text{Corr}(\phi, \tau) \approx 1$, assume this is not the case, such that even when $\text{Corr}(\phi, \tau) = 1$, $(\alpha_m - \alpha_n)^2/4\delta(\text{Corr}(\phi, \tau) + 1)^2 \geq (\alpha_m + \alpha_n)/8$. Substituting $\text{Corr}(\phi, \tau) = 1$ into the condition for an interior solution, $\delta(\text{Corr}(\phi, \tau) + 1) \geq 2|\alpha_m - \alpha_n|$, and simplifying gives $\delta \geq |\alpha_m - \alpha_n|$. When $\delta = |\alpha_m - \alpha_n|$, $(\alpha_m - \alpha_n)^2/4\delta(\text{Corr}(\phi, \tau) + 1)^2$ is as large as possible, making it most likely that $\frac{\partial R(U)\text{(no ambiguity)}}{\partial \text{Corr}(\phi, \tau)} > 0$. Substituting $|\alpha_m - \alpha_n| = \delta$ and $\text{Corr}(\phi, \tau) = 1$, $(\alpha_m - \alpha_n)^2/4\delta(\text{Corr}(\phi, \tau) + 1)^2$ simplifies to $|\alpha_m - \alpha_n|/16$. Given that $|\alpha_m - \alpha_n|/16$ is always smaller than $(\alpha_m + \alpha_n)/8$, $(\alpha_m - \alpha_n)^2/4\delta(\text{Corr}(\phi, \tau) + 1)^2 \geq (\alpha_m + \alpha_n)/8$ when $\text{Corr}(\phi, \tau) = 1$. When $\text{Corr}(\phi, \tau)$ approaches one, $\frac{\partial R(U)\text{(no ambiguity)}}{\partial \text{Corr}(\phi, \tau)} < 0$. Thus, at strongly positive correlations, increasing $\text{Corr}(\phi, \tau)$ decreases the gains from coordination realized by combining missions.

Combining the two results, the gain in the politician’s relative utility in merging goals realized through coordination declines as the correlation becomes more strongly negative ($\text{Corr}(\phi, \tau) \rightarrow -1$) or positive ($\text{Corr}(\phi, \tau) \rightarrow 1$).

**Proof of Proposition 4.** Proving Proposition 4 requires considering the effects of increasing both $\alpha_m + \alpha_n$ and $|\alpha_m - \alpha_n|$. I focus on expression (7), but the results also follow when expression (8) is used. Focusing first on $\alpha_m + \alpha_n$, I show that changing $\alpha_m$ to $\alpha_m + \epsilon$ and $\alpha_n$ to $\alpha_n + \epsilon$ increases $R(U)$. By raising both payoffs simultaneously, the spread between the payoffs, $|\alpha_m - \alpha_n|$, does not change, but the sum of the payoffs grows by $2\epsilon$. As a result, the impact of increasing $\alpha_m + \alpha_n$ is separated from the impact of increasing $|\alpha_m - \alpha_n|$.

Raising the payoffs to the goals to $\alpha_m + \epsilon$ and $\alpha_n + \epsilon$ in expression (7) and subtracting the same expression when the payoffs are $\alpha_m$ and $\alpha_n$ gives:

$$R(U)(\alpha_m + \epsilon, \alpha_n + \epsilon) - R(U)(\alpha_m, \alpha_n) = \Delta R_U = \frac{\epsilon(1 - \text{Corr}(\phi, \tau)^2)}{4(\text{Corr}(\phi, \tau) + 1)} = \frac{\epsilon(1 - \text{Corr}(\phi, \tau))}{4}$$

This expression represents the difference between $R(U)(\alpha_m + \epsilon, \alpha_n + \epsilon)$ and $R(U)(\alpha_m, \alpha_n)$ regardless of whether the agency is right about the politician’s preference. Unless $\text{Corr}(\phi, \tau) = 1$, in which case $\Delta R_U = 0$, $\Delta R_U > 0$. Thus, the politician’s relative utility in combining goals weakly increases as $\alpha_m + \alpha_n$ increases.

To isolate the impact on the politician’s utility from combining goals when the spread between the payoffs increases but their sum remains constant, I compare expression (7) when the individual payoffs are $\alpha_m + \epsilon$ and $\alpha_n - \epsilon$ to the case where they are $\alpha_m$ and $\alpha_n$, assuming $\alpha_m \geq \alpha_n$. While their sum does not change, the spread between them grows to $2\epsilon$. This is
equivalent to the scenario where \( \alpha_n \) increases to \( \alpha_n + \epsilon \) and \( \alpha_m \) decreases to \( \alpha_m - \epsilon \) when \( \alpha_n \geq \alpha_m \). I focus on the case where \( \alpha_m \geq \alpha_n \), but the results also hold when \( \alpha_n \geq \alpha_m \).

I assume first that the agency is correct in its belief about which goal the politician more highly values (i.e. \( i = m \)). Subtracting expression (7) when the payoffs are \( \alpha_m \) and \( \alpha_n \) from the same expression when the payoffs are \( \alpha_m + \epsilon \) and \( \alpha_n - \epsilon \) and simplifying gives:

\[
RU_p(\alpha_m + \epsilon, \alpha_n - \epsilon) - RU_p(\alpha_m, \alpha_n) = \Delta RU_p
\]

\[
= \frac{4\epsilon(\alpha_m - \alpha_n + \epsilon)((\text{Corr}(\varphi, \tau) + 1)^2(2c - 1)(3 - 2c) - 4)}{16\delta(\text{Corr}(\varphi, \tau) + 1)}
\]

Given \( \alpha_m \geq \alpha_n \), \( \Delta RU_p < 0 \) unless \( \text{Corr}(\varphi, \tau) = 1 \) and \( c = 1 \), in which case \( \Delta RU_p = 0 \). Thus, when the agency is correct about the politician’s preference, her expected utility in combining goals weakly declines as \( \alpha_m - \alpha_n \) increases.

When the agency is incorrect about which goal the politician more highly values (i.e. \( i \neq m \)), the analysis is similar. Subtracting expression (7) when the politician’s payoffs are \( \alpha_m \) and \( \alpha_n \) from the case where they are \( \alpha_m + \epsilon \) and \( \alpha_n - \epsilon \) and simplifying gives:

\[
RU_p(\alpha_m + \epsilon, \alpha_n - \epsilon) - RU_p(\alpha_m, \alpha_n) = \Delta RU_p
\]

\[
= \frac{4\epsilon(\alpha_n - \alpha_m - \epsilon)((\text{Corr}(\varphi, \tau) + 1)^2(2c - 1)(1 + 2c) + 4)}{16\delta(\text{Corr}(\varphi, \tau) + 1)}
\]

Because \( \alpha_m \geq \alpha_n \), \( \Delta RU_p < 0 \). Thus, when the agency is incorrect, her relative utility declines as the spread between \( \alpha_m \) and \( \alpha_n \) increases. Given \( \Delta RU_p < 0 \) regardless of whether the agency is correct about the politician’s preference, the politician’s relative utility in combining goals weakly declines as \( |\alpha_m - \alpha_n| \) increases.

\[\Box\]

Proof of Proposition 5. Because the proposition presupposes a pooling equilibrium, expression (7) measures the politician’s relative utility in combining goals. I first focus on the case where the agency’s belief is correct. Taking the first derivative of expression (7) with respect to \( c \) when \( \mu = (2c - 1)(\alpha_m - \alpha_n) \) and simplifying gives:

\[
\frac{\partial RU_p(i = m)}{\partial c} = \frac{(\text{Corr}(\varphi, \tau) + 1)(\alpha_m - \alpha_n)^2(1 - c)}{2\delta}
\]

Unless \( \text{Corr}(\varphi, \tau) = -1 \), \( \alpha_m = \alpha_n \), or \( c = 1 \), in which case \( \partial RU_p(i = m)/\partial c = 0 \), \( \partial RU_p(i = m)/\partial c > 0 \). Thus, the politician’s relative utility in combining goals weakly increases as the agency’s becomes more certain about its accurate belief.

When the agency is incorrect, \( \mu = (2c - 1)(\alpha_n - \alpha_m) \). Because the proposition is written from the perspective of increases in uncertainty instead of certainty, for convenience, I introduce the variable \( b \) and set it equal to \( 1 - c \). Substituting \( (2(1 - b) - 1)(\alpha_n - \alpha_m) \) for \( \mu \), and taking the first derivative of expression (7) with respect to \( b \) gives:

\[
\frac{\partial RU_p(i \neq m)}{\partial b} = \frac{(\text{Corr}(\varphi, \tau) + 1)(\alpha_m - \alpha_n)^2(1 - b)}{2\delta}
\]

Unless \( \text{Corr}(\varphi, \tau) = -1 \) or \( \alpha_m = \alpha_n \), such that \( \partial RU_p(i \neq m)/\partial c = 0 \), \( \partial RU_p(i \neq m)/\partial b > 0 \). When the agency is wrong about the politician’s relative preference, the politician’s relative utility in combining goals weakly increases as uncertainty increases.

\[\Box\]

Proof of Proposition 6. The proposition assumes a pooling equilibrium in which the agency is correct about which goal the politician prefers. Thus, the proof considers expression (7) where \( \mu = (2c - 1)(\alpha_m - \alpha_n) \). In contrast to Proposition 3, Proposition 6 specifically considers how
the loss from uncertainty changes with $\text{Corr}(\varphi, \tau)$. As a result, I focus the second term of the numerator of expression (7) to remove the positive effects on the politician’s relative utility in combining goals achieved through coordination. Removing the first and third terms of the numerator of expression (7) and taking the partial derivative with respect to $\text{Corr}(\varphi, \tau)$ gives:

$$\frac{\partial RU(\text{no coordination})}{\partial \text{Corr}(\varphi, \tau)} = \frac{16\delta}{\alpha_m - \alpha_n}$$

When $c = 1/2$ or $\alpha_m = \alpha_n$, $\frac{\partial RU(\text{no coordination})}{\partial \text{Corr}(\varphi, \tau)} = 0$. Otherwise, $\frac{\partial RU(\text{no coordination})}{\partial \text{Corr}(\varphi, \tau)} > 0$. Thus, the politician’s loss from the agency’s uncertainty weakly declines as $\text{Corr}(\varphi, \tau)$ grows, proving Proposition 6.

**Deriving Equilibrium Conditions When $P(\varphi = 1) and P(\tau = 1)$ Vary.** To show the effect of relaxing the assumption that $P(\varphi = 1) = P(\tau = 1) = 0.5$, I begin by substituting $p$ for 0.5, where $0 \leq p \leq 1$, such that $P(\varphi = 1) = P(\tau = 1) = p$. The focus here is on recreating Proposition 1, which characterizes the conditions for the pooling and separating equilibria. Still, just as I demonstrate Proposition 1 still holds when the assumption regarding the probabilities is relaxed, Propositions 2 through 6 do as well. To conserve space, I do not also show those proofs.

In order to characterize the impact on Proposition 1 of allowing $P(\varphi = 1) and P(\tau = 1)$ to vary, I both recreate expression (9) which shows the condition for a pooling equilibrium and further demonstrate that, if the condition is not satisfied, a separating equilibrium exists in which the goals are only combined if the agency’s belief is accurate. When $P(\varphi = 1) = P(\tau = 1) = p$, expression (7) representing the politician’s relative utility in combining as opposed to separating the goals when the agency is uncertain about its belief can be written as:

$$RU_p = \frac{(2\delta(\alpha_m + \alpha_n)(1 - \gamma)\gamma + \gamma^2\mu(2\alpha_m - 2\alpha_n - \mu) - (\alpha_m - \alpha_n)^2)p}{4\delta\gamma}$$

where $\mu(c, \alpha_i, \alpha_j) = (2c - 1)(\alpha_i - \alpha_j)$ and $\gamma = p + (1 - p)\text{Corr}(\varphi, \tau)$. Similarly, expression (8) which shows the politician’s relative utility when the agency is certain about its accurate belief is:

$$RU_p = \frac{(2\delta(\alpha_m + \alpha_n)(1 - \gamma)\gamma + (\gamma^2 - 1)(\alpha_m - \alpha_n)^2)p}{4\delta\gamma}$$

Rearranging the first expression and substituting $\mu(c, \alpha_i, \alpha_j) = (2c - 1)(\alpha_n - \alpha_m)$ to capture the case where the agency is incorrect, the condition for a pooling equilibrium, represented by expression (9) in Proposition 1, becomes:

$$\sqrt{\frac{\delta(1 - p)(1 - \text{Corr}(\varphi, \tau))(\alpha_m + \alpha_n)}{2(p + (1 - p)\text{Corr}(\varphi, \tau))(\alpha_m - \alpha_n)^2}} - \frac{1}{4(p + (1 - p)\text{Corr}(\varphi, \tau))^2 \geq c}$$

Thus, while varying $p$ has competing effects on the condition, like expression (9), this inequality demonstrates that a pooling equilibrium occurs when the agency’s confidence in its belief is relatively low.

Further, one can show that the value for the above replacement expression for (8) when the agency is certain about its accurate belief is never negative given the new condition for an interior solution which is $\gamma\delta \geq |\alpha_m - \alpha_n|$. As a result, the politician will always combine the goals when the agency’s belief is correct. Thus, Proposition 1 continues to hold once the new inequality is substituted for (9), which demonstrates that the structure of the equilibria are unaffected by allowing $P(\varphi = 1) = P(\tau = 1) = p$.  

\[\Box\]