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The Iraq War as a Bayesian Game: The Government, the Media, and the Electorate

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Abstract

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By Jung Hwan Kim

The process of the invasion of Iraq in 2003 is a good example of the complicated interactions and relationship between the government, the media, and the electorate. In an effort to shed light on better understanding of these factors, this paper constructs a stylized model to examine the effect of the electorate's vigilant or lax attitude towards the government's proposal to pursue war, and of the media's sensational or serious coverage of Iraq and possible weapons of mass destruction upon the government's decision making. The paper constructs a basic model of a dynamic Bayesian game with two players, the government and the electorate; an extension of this model includes the media as a third player. In the basic model, I find that the equilibrium strategy for the government depends on the degree of the electorate's vigilance. When weapons of mass destruction do not exist, the government has a higher expected utility by proposing peace than proposing war when the electorate is more vigilant. In the extended model, I find that in the presence of sensational media coverage, the government has a higher expected utility from proposing peace when the weapons do not exist only if the electorate is more vigilant than in the basic model.

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I.   INTRODUCTION

The U.S. invasion of Iraq in 2003 lasted from March 19th to May 1st. A combined force of troops from the United States, the United Kingdom, Australia and Poland invaded Iraq "to disarm Iraq of weapons of mass destruction, to end Saddam Hussein's support for terrorism, and to free the Iraqi people" (*The White House* 2003).

The run up to this invasion included complicated interactions among the United States' government, the media, and the electorate. Important questions can be raised regarding these interactions. How does the electorate's attitude towards the government's proposals affect the strategy that the government chooses? How does the media's coverage influence the electorate's propensity to support the government's strategies and influence the strategies themselves? These factors need to be studied in order to better understand how complex national decisions are influenced by the actions of the electorate and the media in a democracy.

In my thesis, I construct two dynamic Bayesian game models to capture the interaction between the government, the media, and the electorate in run-up to the Iraq War. The first game is a basic model featuring two players, the government and the electorate. A second game includes the media in order to investigate the impact of its role of serious or sensational coverage of information regarding the presence of weapons of mass destruction upon the strategies of the government and the electorate. In the first model, I investigate whether the extent to which the electorate's type is vigilant or lax towards the government's proposals influences the government's strategy. In the second model, I study the extent to which the media's sensational or serious coverage of Iraq influences the government's decision making.

I find that the equilibrium strategy for the government depends on the degree of the electorate's vigilance. When weapons of mass destruction do not exist, if the electorate is more

vigilant towards the government proposal, then the government obtains a higher expected utility by proposing peace rather than proposing war. In the extended model, I find that if the media's coverage of information is sensational, the government requires a more vigilant electorate in order to have higher expected utility from proposing peace when the weapons do not exist.

The major contribution to this paper originates from the literature that focuses on the relationship between the government and the electorate. These studies are normally conducted empirically. In contrast to the existing literature, this paper provides a game-theoretic approach for the analysis.

In Section II below, I provide an overview of the literature and outline some of the papers that are essential in order to understand the relationship between the government and the electorate. In Section III, I present my theoretical models and their Bayesian Nash equilibria, and outline the importance of the results. Finally, Section IV offers my conclusions and possible extensions for further research.

II.   LITERATURE

Numerous scholars have already studied the interaction among the government and the electorate in the context of the influential factors that must not be ignored when looking at this relationship. For instance, Baum (2012) uses cross-national data of the news coverage on Iraq to present the impact of party systems on the media and the public support towards the government. He claims that "citizens in countries with larger number of parties confront more critical and diverse coverage of Iraq, and those with more widespread access to mass media are more likely to oppose the war and their nations likely to contribute fewer troops to the coalition" (Baum 2012, pp. 1). Since multiparty electoral systems typically lead the media to cover a wider set of issues relative to the coverage in two-party systems, "citizens in multiparty systems are more likely to be skeptical of a leader's foreign policy, and this should reduce leaders' willingness to accept the risky gamble of a war" (Baum 2012, pp. 1).

Apart from party systems, scholars have also suggested that the elites of a country have the power to manipulate the media. In early stages of a conflict, elites – especially the president – often have an informational advantage that renders public perceptions of reality to be very elastic. With private information, these elites can influence the media to spread this information in favor of the government's proposal. This influence has been well studied and researched by other scholars, who have shown that U.S. news content, especially in times of war, tends to be indexed to the tenor of elite debate (Cook 1994; Baum and Groeling 2008). It shows that since in foreign affairs the president is the most authoritative and hence newsworthy of all elites, he wields a disproportionate influence over the content of news regarding foreign affairs. If this is the case, the media would tend to disseminate information in favor of the government, and the electorate is more likely to support after hearing the information that is not truly unbiased. While these

researchers assume that the elites have strong influence over the media and hence over the formation of public opinions towards the foreign policy, other researchers have also come up with counter arguments. They argue that when an issue involves contested cultural norms, the media tends to challenge the government's preferred frame (Entman 2003; Bennett, Lawrence, and Livingstone 2006). If this is the case, the media can relay information that is against the government's policy, and the electorate is likely to go against the government and its agenda.

Another important factor that scholars have brought up is role of the international organizations that are involved in foreign policies. Chapman (2009) argues that multilateral security institutions, such as the UN Security Council, and their authorizations can increase public support for policy. This is because the public is uncertain about surrounding international events, and when it is about to make decisions about these policies, it treats these organizations as additional sources of information that it can rely on.

III.   THEORETICAL MODELS AND RESULTS

Model 1: A Bayesian Game with Two Players

This basic model (Appendix 1) is a dynamic Bayesian game tree with Nature and two players, the government (*G*) and the electorate (*E*). The players, action, and type sets for this game are summarized below:

Players	Nature (*N*), Government (*G*), Electorate (*E*)
Action sets	*G*: {*Propose War* (*PW*), *Propose Peace* (*PP*)} *E*: {*Support* (*S*), *Not Support* (−*S*)}
Type sets	θ_W = *Probability of the existence of weapons of mass destruction* θ_E = *Probability of the electorate's vigilance*

The game begins by Nature that determines the electorate's type, whether it is vigilant or lax. Let θ_E be the probability of the electorate being vigilant and $1 - \theta_E$ the probability of the electorate being lax. There is private information: the electorate knows its own type, but the government does not.

Aside from the electorate's type, Nature also determines the probability that weapons of mass destruction exist in Iraq. The value θ_W represents the probability that weapons of mass destruction exist in Iraq while the value $1 - \theta_W$ represents the probability that weapons of mass destruction do not exist in Iraq.

After Nature decides the types, the government first takes its action by proposing war or proposing peace to Iraq. It has private information about weapons of mass destruction because it can obtain information from organizations such as the United Nations (UN), Central Intelligence Agency (CIA), the State Department, and other agencies that deal with foreign policy. In reality, its information is imperfect, as was evident by the failure to discover weapons of mass

destruction in Iraq. For simplicity, however, the model assumes that the government has perfect information about the existence of weapons of mass destruction.

After the government takes its actions, the electorate takes its action by supporting or not supporting the government's proposal. The electorate knows its own type but does not have any information about the existence of weapons of the mass destruction. The paper assumes that the lax electorate does put any effort towards examining the government's proposal. Hence, while the vigilant electorate can either support or not support, the lax electorate always supports. After taking actions sequentially, each player its payoff. The utility payoffs and their magnitudes are explained in Appendix 3.

The expected utilities of each player are calculated in order to investigate if the electorate's type affects the strategies that the government chooses in this game. The following is the computation of the expected utility of the electorate when it is vigilant:

$$Eu_E\,(S,\,\theta_E) = (\theta_E)(\theta_W)(e + d) +\ (\theta_E)(1 - \theta_W)(e - d)$$

$$\Rightarrow (\theta_E)(\theta_W)(e + d) - (\theta_E)(\theta_W)(e - d) + (\theta_E)(e - d)$$

$$\Rightarrow (\theta_E)(\theta_W)(2d) + (\theta_E)(e - d)$$

$$Eu_E\,(-S,\,\theta_E) = (\theta_E)(\theta_W)(-e + d) + (\theta_E)(1 - \theta_W)(-e - d)$$

$$\Rightarrow (\theta_E)(\theta_W)(-e + d) - (\theta_E)(\theta_W)(-e - d) + (\theta_E)(-e - d)$$

$$\Rightarrow (\theta_E)(\theta_W)(2d) + (\theta_E)(-e - d)$$

$$\therefore Eu_E\,(S,\,\theta_E) > Eu_E\,(-S,\,\theta_E).$$

The result illustrates that the electorate has a higher expected utility when it supports the government's proposal regardless of the values of θ_W. The lax electorate is assumed to have only one action, to support. Thus, the dominant strategy for both type of the electorate in this basic model is to support (S).

After eliminating the electorate's dominated strategy $(-S)$, the expected utility of the government when the electorate supports is calculated. The following is the computation of the expected utility of the government when it assumes weapons of mass destruction exist in Iraq with the probability of (θ_W):

$$Eu_G\ (PW,\ \theta_W) = (\theta_W)(\theta_E)(g + d) + (\theta_W)(1 - \theta_E)(g^* + d)$$

$$\Rightarrow (\theta_G)(\theta_E)(g + d) - (\theta_W)(\theta_E)(g^* + d) + (\theta_W)(g^* + d)$$

$$\Rightarrow (\theta_W)(\theta_E)(g - g^*) + (\theta_W)(g^* + d)$$

$$Eu_G\ (PP,\ \theta_W) = (\theta_W)(\theta_E)(-g - d) + (\theta_W)(1 - \theta_E)(-g - d)$$

$$\Rightarrow (\theta_W)(-g - d)$$

$$\therefore Eu_G\ (PW,\ \theta_W) > Eu_G\ (PP,\ \theta_W).$$

The result illustrates that the government has a higher expected utility when it proposes war. The following is the computation of the expected utility of the government when weapons of mass destruction do not exist:

$$Eu_G\ (PW,\ 1 - \theta_W) = (1 - \theta_W)(\theta_E)(g - d) + (1 - \theta_W)(1 - \theta_E)(g^* - d)$$

$$\Rightarrow (1 - \theta_W)(\theta_E)(g - d) + (1 - \theta_W)(\theta_E)(g^* - d) + (1 - \theta_W)(g^* - d)$$

$$\Rightarrow (1 - \theta_W)(\theta_E)(g - g^*) + (1 - \theta_W)(g^* - d)$$

$$Eu_G\ (PP,\ 1 - \theta_W) = (1 - \theta_W)(\theta_E)(-g + d) + (1 - \theta_W)(1 - \theta_E)(-g + d)$$

$$\Rightarrow (1 - \theta_W)(-g + d).$$

By comparing these two expected utilities above, it is clear that the probability of the electorate's vigilance θ_E determines which expected payoff is larger. The following comparison illustrates how the value of θ_E determines the magnitude of $Eu_G(PP,\ 1 - \theta_W)$ and $Eu_G(PW,\ 1 - \theta_W)$:

$$Eu_G(PP,\ 1 - \theta_W) > Eu_G(PW,\ 1 - \theta_W)$$

$$\Rightarrow (1 - \theta_W)(-g + d) > (1 - \theta_W)(\theta_E)(g - g^*) + (1 - \theta_W)(g^* - d)$$

$$\Rightarrow -g + d - g* + d > (\theta_E)(g - g*)$$

$$\Rightarrow \theta_E < \frac{-g-g*+2d}{(g-g*)}$$

$$\Rightarrow \theta_E > \frac{g+g*-2d}{(g-g*)}.$$

This comparison illustrates that if the value of θ_E is greater than $\frac{g+g*-2d}{(g-g*)}$, the government has a

higher expected utility when it proposes peace. Conversely, it implies that if the value θ_E is

smaller than $\frac{g+g*-2d}{(g-g*)}$, the government has a higher expected utility when it proposes war.

    Looking at the results, the model can have either a pooling or a separating equilibrium.

The pooling equilibrium in which the government always chooses to propose war is possible and

is dependent on the value of θ_E. The government will choose to propose war if the value of θ_E is

smaller than $\frac{g+g*-2d}{(g-g*)}$. However, the pooling equilibrium in which the government always

chooses to propose peace is impossible in this model because the government has negative

expected utility by proposing peace when weapons of mass destruction exist.

    There is only one separating equilibrium as well. When the government knows the

existence of weapons of mass destruction with the probability of θ_W, it always proposes war.

When weapons do not exists with the probability of $1 - \theta_W$, it will propose peace only if the

value of θ_E is greater than $\frac{g+g*-2d}{(g-g*)}$. Thus, the model has the Bayesian Nash equilibria, one

pooling and separating, which are summarized in Figure #1 below:

Pooling BNE (G, E):	Separating BNE (G, E):
$s_G*^1(\theta_W, 1-\theta_W) = PW$, PW only if $\theta_E < \frac{g+g*-2d}{(g-g*)}$	$s_G*(\theta_W, 1-\theta_W) = PW$, PP only if $\theta_E > \frac{g+g*-2d}{(g-g*)}$
$s_E* = S$	$s_E* = S$

Figure #1: Bayesian Nash Equilibria in two players' game

Also, this value θ_E allows the paper to establish the following proposition:

Proposition 1: In a Bayesian game of the Iraq War with two players (the government and the electorate), the value of $\theta_E = \frac{g+g*-2d}{(g-g*)}$ acts as a threshold that determines the equilibrium strategy for the government.

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[1] The form "s_G*" represents the strategy for the government (G).

Model 2: A Bayesian Game with Three Players

This extended model (Appendix 2) is a dynamic Bayesian game tree with Nature and three players, the government (*G*), the media (*M*), and the electorate (*E*). The players, action, and type sets for this game are summarized below:

Players	Nature (*N*), Government (*G*), Media (*M*), Electorate (*E*)
Action sets	*G* = {*Propose War (PW), Propose Peace (PP)*} *M* = {*Send information Sensationally (SEN) or Seriously (SER)*} *E*= {*Support (S), Not Support (−S)*}
Type sets	θ_W = *Probability of the existence of weapons of Mass Destruction* θ_E = *Probability of the electorate's vigilance*

This extended model has the same structure as the basic model until the government takes its actions. Just like the previous model, the government private information (and perfect information) about weapons of mass destruction, and it does not know the type of the electorate.

After the government takes its actions, the media participates in the game and takes its action by sending information sensationally or seriously. The media does not have information about the electorate's type. However, it has private information about weapons of mass destruction. I assume that the media, just like the government, can obtain the information from numerous sources, including the government, the United Nations (UN), Central Intelligence Agency (CIA), the State Department, and other agencies that deal with foreign policy. In reality, its information is imperfect. However, for simplicity, the model assumes that the media has perfect information about weapons of mass destruction.

After the media chooses its action, the electorate moves. It has the same action set as that of the basic model. After taking actions sequentially, each player obtains utilities as shown in Appendix 2.

The expected utilities of each player are calculated in order to investigate if media's sensational or serious coverage of the information about Iraq and weapons of mass destruction affects the strategies that the government chooses in the game of the Iraq War. The following is the computation of the expected utility of the electorate when it is vigilant:

$$Eu_E\,(S,\,\theta_E) = (\theta_E)(\theta_W)(e + d + z^* + e + d + z) + (\theta_E)(1 - \theta_W)(e - d + z^* + e - d + z)$$

$$\Rightarrow (\theta_E)(\theta_W)(2e + 2d + z + z^*) - (\theta_E)(\theta_W)(2e - 2d + z + z^*) + (\theta_E)(2e - 2d + z + z^*)$$

$$\Rightarrow (\theta_E)(\theta_W)(2d) + (\theta_E)(2e - 2d + z + z^*)$$

$$Eu_E\,(-S,\,\theta_E) = (\theta_E)(\theta_W)(-e + d - z^* - e + d - z) + (\theta_E)(1 - \theta_W)(-e - d - z^* - e - d - z)$$

$$\Rightarrow (\theta_E)(\theta_W)(-2e + 2d - z - z^*) - (\theta_E)(\theta_W)(-2e - 2d - z - z^*) + (\theta_E)(-2e - 2d - z - z^*)$$

$$\Rightarrow (\theta_E)(\theta_W)(2d) + (\theta_E)(-2e - 2d - z - z^*)$$

$$\therefore Eu_E\,(S,\,\theta_E) > Eu_E\,(-S,\,\theta_E).$$

The result illustrates that the electorate has a higher expected utility when it supports the government's proposal regardless of the values θ_W. Also, the media's information, whether it is sensational or serious, does not change the strategy that the electorate makes. The lax electorate is assumed to have only one action, to support. Thus, the dominant strategy for both type of the electorate in this model is to support (S).

After eliminating the electorate's dominated strategy $(-S)$, the expected utility of the media when the electorate supports is calculated. The following is the computation of the expected utility of the media when weapons of mass destruction exists with probability θ_W:

$$Eu_M (SEN, \theta_W) = (\theta_E)(\theta_W)(x^* + d) + (1 - \theta_E)(\theta_W)(x^* + d)$$

$$\Rightarrow (\theta_W)(x^* + d)$$

$$Eu_M (SER, \theta_W) = (\theta_E)(\theta_W)(x + d) + (1 - \theta_E)(\theta_W)(x + d)$$

$$\Rightarrow (\theta_W)(x + d)$$

$$\therefore Eu_M (SEN, \theta_W) > Eu_M (SER, \theta_W).$$

The result illustrates that the media has a higher utility when it sends out information

sensationally regardless of the value θ_W. The following is the computation of the expected utility

of the media when weapons of mass destruction do not exist:

$$Eu_M (SEN, 1 - \theta_W) = (\theta_E)(1 - \theta_W)(x^* + d) + (1 - \theta_E)(1 - \theta_W)(x^* + d)$$

$$\Rightarrow (1 - \theta_W)(x^* + d)$$

$$Eu_M (SER, 1 - \theta_W) = (\theta_E)(1 - \theta_W)(x + d) + (1 - \theta_E)(1 - \theta_W)(x + d)$$

$$\Rightarrow (1 - \theta_W)(x + d)$$

$$\therefore Eu_M (SEN, \theta_W) > Eu_M (SER, \theta_W).$$

The result illustrates that the media has a higher utility when it sends out information

sensationally regardless of the value θ_W. Thus, the dominant strategy for both types of the media

is to send information sensationally (*SEN*).

After eliminating the media's dominated strategy (*SER*), the expected utility of the

government when the electorate supports and when the media sends out information

sensationally is calculated. The following is the computation of the expected utility of the

government when it assumes weapons of mass destruction exist in Iraq with probability θ_W:

$$Eu_G (PW, \theta_W) = (\theta_W)(\theta_E)(g + d + y^*) + (\theta_W)(1 - \theta_E)(g^* + d + y^*)$$

$$\Rightarrow (\theta_W)(\theta_E)(g + d + y^*) - (\theta_W)(\theta_E)(g^* + d + y^*) + (\theta_W)(g^* + d + y^*)$$

$$\Rightarrow (\theta_W)(\theta_E)(g - g^*) + (\theta_W)(g^* + d + y^*)$$

$$Eu_G (PP, \theta_W) = (\theta_W)(\theta_E)(-g - d) + (\theta_W)(1 - \theta_E)(-g - d)$$

$$\Rightarrow (\theta_W)(-g - d)$$

$$\therefore Eu_G (PW, \theta_W) > Eu_G (PP, \theta_W).$$

The result illustrates that the government has a higher expected utility when it proposes war. Also, the media's sensational information does not change the strategy that the government makes. The following is the computation of the expected utility of the government when weapons of mass destruction do not exist:

$$Eu_G (PW, 1 - \theta_W) = (1 - \theta_W)(\theta_E)(g - d + y^*) + (1 - \theta_W)(1 - \theta_E)(g^* - d + y^*)$$

$$\Rightarrow (1 - \theta_W)(\theta_E)(g - d + y^*) + (1 - \theta_W)(\theta_E)(g^* - d + y^*) + (1 - \theta_W)(g^* - d + y^*)$$

$$\Rightarrow (1 - \theta_W)(\theta_E)(g - g^*) + (1 - \theta_W)(g^* - d + y^*)$$

$$Eu_G (PP, 1 - \theta_W) = (1 - \theta_W)(\theta_E)(-g + d) + (1 - \theta_W)(1 - \theta_E)(-g + d)$$

$$\Rightarrow (1 - \theta_W)(-g + d).$$

By comparing these two expected utilities above, it is clear that the probability of the electorate's vigilance θ_E determines which expected payoff is better off. The following comparison illustrates how the value of θ_E determines the magnitude of $Eu_G(PP, 1 - \theta_W)$ and $Eu_G(PW, 1 - \theta_W)$:

$$Eu_G(PP, 1 - \theta_W) > Eu_G(PW, 1 - \theta_W)$$

$$\Rightarrow (1 - \theta_W)(-g + d) > (1 - \theta_W)(\theta_E)(g - g^*) + (1 - \theta_W)(g^* - d + y^*)$$

$$\Rightarrow -g + d - g^* + d - y^* > (\theta_E)(g - g^*)$$

$$\Rightarrow \theta_E < \frac{-g - g^* + 2d - y^*}{(g - g^*)}$$

$$\Rightarrow \theta_E > \frac{g + g^* - 2d + y^*}{(g - g^*)}.$$

This comparison illustrates that if the value of θ_E is greater than $\frac{g+g^*-2d-y^*}{(g-g^*)}$, the government has

a higher expected utility when it proposes peace. Conversely, if the value θ_E is smaller than

$\frac{g+g^*-2d+y^*}{(g-g^*)}$, the government has a higher expected utility when it proposes war. This result is

analogous to that of the basic model. However, comparing with the value of θ_E in the basic

model, it is $\frac{y^*}{(g-g^*)}$ bigger. This difference implies that when the media disseminates the

information sensationally, if the government wants to have higher expected utility by proposing

peace, it requires the electorate's vigilance to be higher.

Looking at the results, this model, just like the basic model, can also have either a

pooling or a separating equilibrium, which is dependent on the value of θ_E. As mentioned earlier

in the basic model, the pooling equilibrium in which the government always proposes war exists

only if the value of θ_E is smaller than $\frac{g+g^*-2d+y^*}{(g-g^*)}$, which is bigger than the value in the basic

model. However, the pooling equilibrium in which the government always proposes peace does

not exist because the government's utility is negative when the weapons exist.

The separating equilibrium also exists only if the value of θ_E is greater than $\frac{g+g^*-2d+y^*}{(g-g^*)}$;

thus its strategy becomes a separating equilibrium. Thus, the model has two Bayesian Nash

equilibria (one pooling and separating), which are summarized in Figure #2 below:

Pooling BNE (G, M, E):	*Separating BNE (G, M, E):*
$s_G^*(\theta_W, 1-\theta_W) = PW$, *PW only if* $\theta_E < \frac{g+g^*-2d+y^*}{(g-g^*)}$	$s_G^*(\theta_W, 1-\theta_W) = PW$, *PP only if* $\theta_E > \frac{g+g^*-2d+y^*}{(g-g^*)}$
$s_M^* = SEN$	$s_M^* = SEN$
$s_E^* = S$	$s_E^* = S$

Figure #2: Bayesian Nash Equilibria in three players' game

Also, this value θ_E allows the paper to establish the following propositions:

Proposition 2: In a Bayesian game of the Iraq War with three players (the government, the

media and the electorate), the value of $\theta_E > \frac{g+g^*-2d+y^*}{(g-g^*)}$ acts as a threshold that

determines the equilibrium strategy for the government.

Proposition 3: The participation of media increases the value of the threshold to be causes $\frac{y^*}{(g-g^*)}$

greater, meaning that the government requires electorate's vigilance to be higher

in order to have a higher expected utility by proposing peace.

IV. CONCLUSION AND EXTENSIONS

This paper constructs two models of Bayesian game, representing the relationship between the government, the media, and the electorate. It analyzes them in order to investigate the effect of the electorate's type (vigilant or lax) and of the media's sensational or serious coverage of the information about Iraq and weapons of mass destruction upon the government's decision making. I find that there are two Bayesian Nash equilibria, one pooling and one separating, in the basic and the extended models. They depend on the value of θ_E, and this value acts as the threshold that determines the equilibrium strategy for the government when weapons of mass destruction do not exist. If θ_E is higher than $\frac{g+g^*-2d}{(g-g^*)}$ in two players' game, the government has a higher expected utility by proposing peace, and its strategy becomes a separating equilibrium.

Conversely, if θ_E is lower than $\frac{g+g^*-2d}{(g-g^*)}$ in two players' game, the government has a higher expected utility by proposing war, and its strategy becomes a pooling equilibrium. Thus, the result illustrates that the electorate's type influences the government's strategy. Also, I find that the media's sensational coverage of the information of Iraq and weapons of mass destruction causes the government to require the value θ_E to be $\frac{y^*}{(g-g^*)}$ higher than that of the basic model in order to have a higher expected payoff by proposing peace. It is because when the media sends out the information, the electorate is more aware of the danger of Iraq and of weapons of mass destruction. If weapons do not exist, the electorate has to be more vigilant about the existence of the weapons after accessing the information from media because the media can influence the electorate to support the government's war proposal against Iraq. Thus, the result illustrates that the media's sensational coverage of information influences the government's strategy.

While this paper offers some insight into the understanding of the essential factors that influence the relationship between the government, the media, and the electorate, there are several ways to expand upon the ideas introduced in this thesis. One major extension is to calculate the Perfect Bayesian Nash equilibria for both basic and extended model. The current calculation only deals with the simple Bayesian Nash equilibria, and they may involve strategies that are not sequentially rational. Calculation of the Perfect Bayesian Nash equilibria fixes this problem because it utilize conditional beliefs that players have about the other players' types, and this will thus allow the paper to evaluate the sequential rationality.

Also, another possible extension of this paper is to include the type for the media. Researches have shown that elites have an informational advantage on foreign policies, and they can have a disproportionate influence on the media's coverage of information. Thus, these elites can lead the media to send information in favor of the government's preferred frame. Construction of a Bayesian game tree that includes the type of the media, one that is influenced by the elites and vice versa, would render a better model that represents the relationship among the three players more accurately.

Further extension of this paper may also examine the effect of the addition of other influential players such as an international organization. This paper only includes the participation of the media as the factor that influences the relationship between the government and the electorate. However, an international organization has been studied and proven to render a significant influence on the public's perception on foreign policies. Thus, this addition could result in more useful and effective model that represents the relationship between the government and the electorate.

Moreover, the parameter of the variables for the utility is another issue that implies both limitation and further possible extension. The paper assumes certain magnitude of the utility payoffs (Appendix 3); however, the reality suggests that it does not have a strict standard, and it can be very flexible depending on the situation. Analyzing the expected utility from the various situations in which the magnitude of the variable varies could generate more realistic representation of the relationship between the government, the media, and the electorate with more possible separating and pooling equlibria.

Aside from the payoff parameters, the paper can be further extended by making the government and the media have imperfect information about Iraq and weapons of mass destruction. The paper assumes the perfect information for simplicity; however, the reality proves that their information is imperfect, as was evident by the failure to discover weapons of mass destruction in Iraq. Thus, this revision could generate more realistic representation and better analysis of the relationship between the government, the media, and the electorate.

Lastly, the paper only utilizes a theoretic approach to analyze the relationship. However, numerous scholars have already studied this topic empirically and generated the empirical analysis using appropriate data. Incorporating appropriate data and presenting the empirical analysis as the evidence to support the theoretic analysis and results could make the paper more interesting and powerful.

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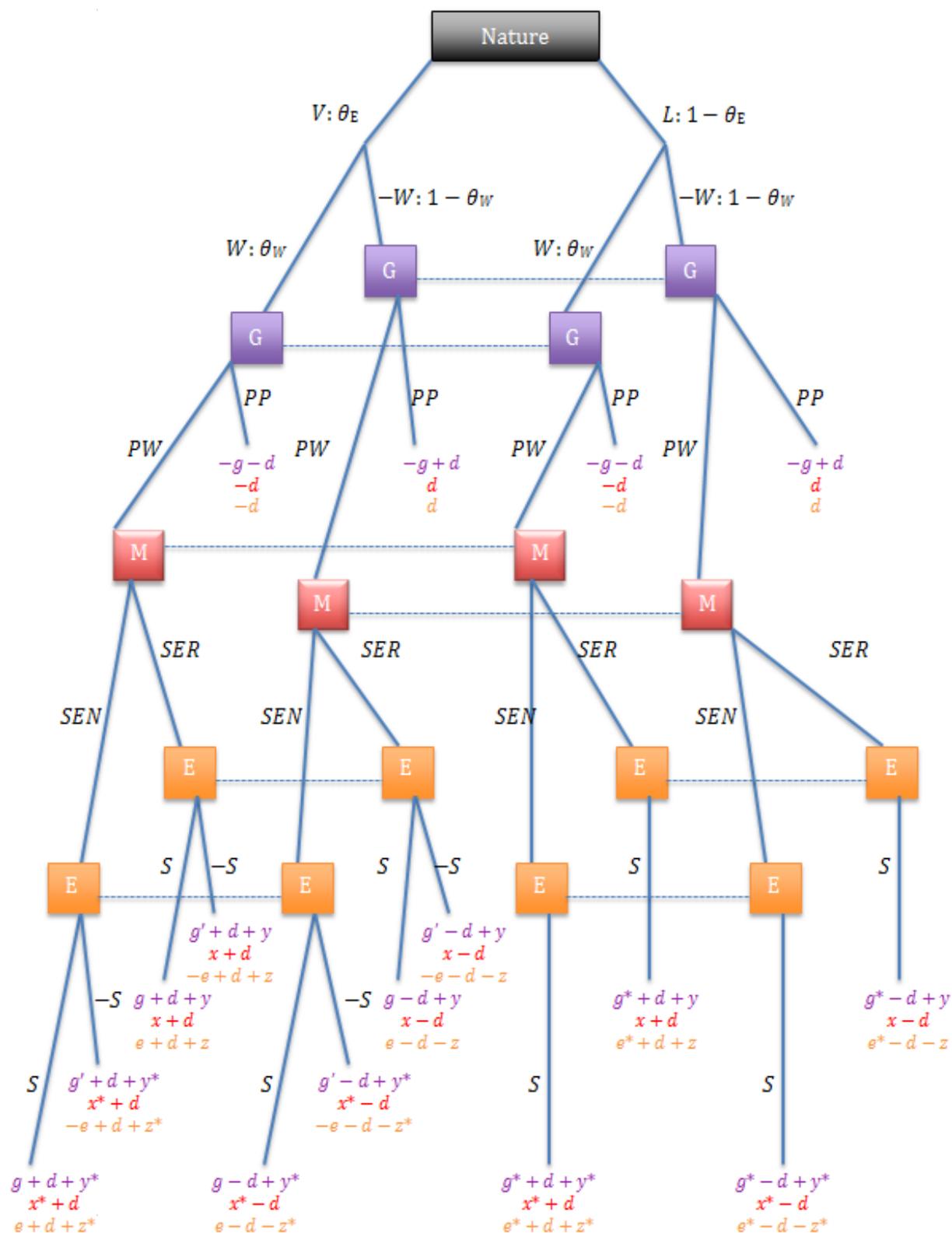"President Discusses Beginning of Operation Iraqi Freedom." *The White House*. Office of the Press Secretary, 22 Mar. 2003. Web. 1 Dec. 2012. <http://georgewbush-whitehouse.archives.gov/news/releases/2003/03/20030322.html>.

VI. APPENDIX

Appendix 1: The Basic Model with Two Players
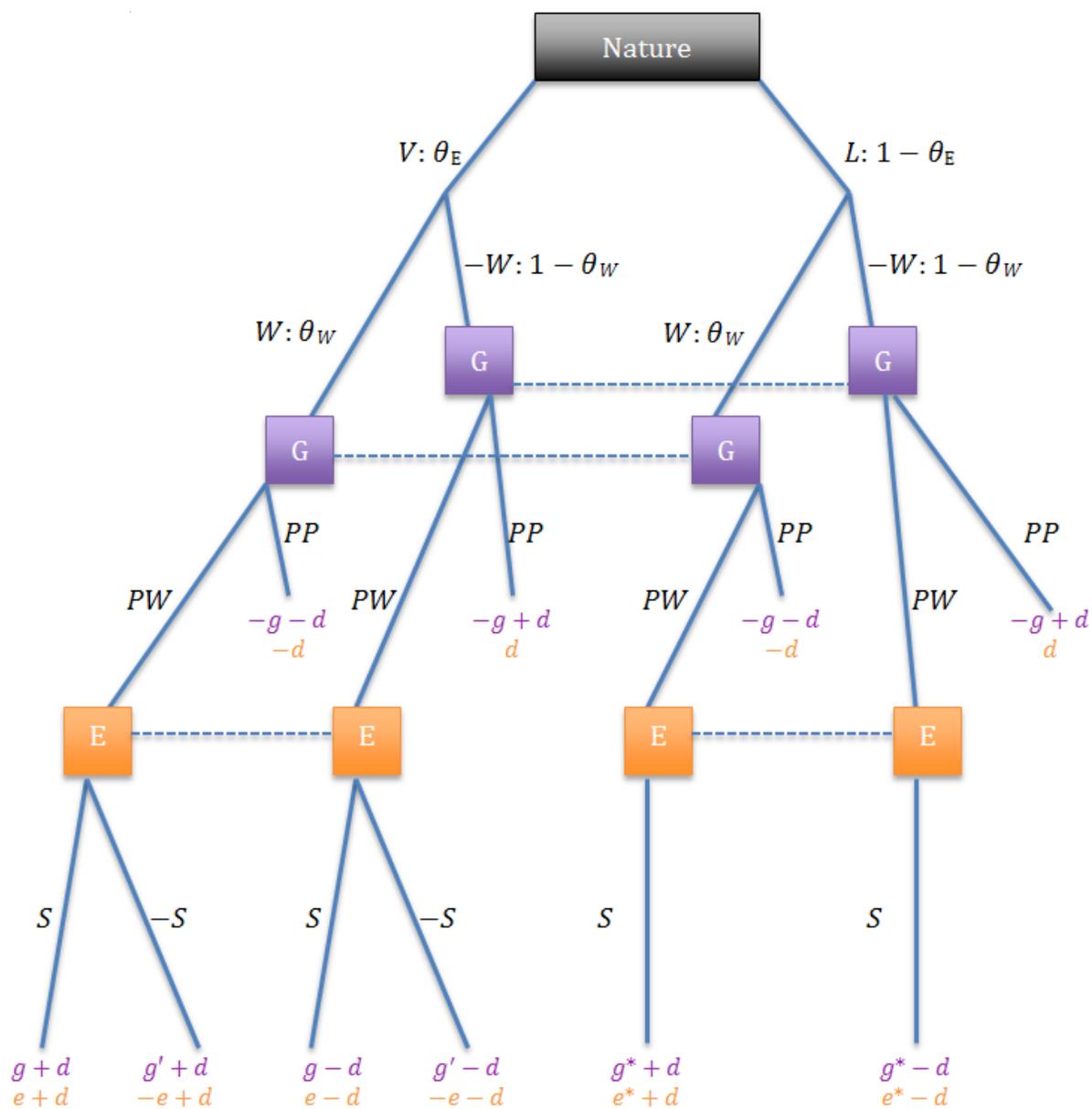
Appendix 2: The Extended Model with Three Players

Nature

$V: \theta_E$ $L: 1 - \theta_E$

$-W: 1 - \theta_W$ $-W: 1 - \theta_W$

$W: \theta_W$ $W: \theta_W$

G   G   G   G

PP PP PP PP

PW PW PW PW

$\begin{matrix} -g-d \\ -d \\ -d \end{matrix}$ $\begin{matrix} -g+d \\ d \\ d \end{matrix}$ $\begin{matrix} -g-d \\ -d \\ -d \end{matrix}$ $\begin{matrix} -g+d \\ d \\ d \end{matrix}$

M   M   M   M

SER SER SER SER

SEN SEN SEN SEN

E   E   E   E

S $-S$ S $-S$ S

E   E   E   E

$\begin{matrix} g'+d+y \\ x+d \\ -e+d+z \end{matrix}$ $\begin{matrix} g'-d+y \\ x-d \\ -e-d-z \end{matrix}$

$-S$ $\begin{matrix} g+d+y \\ x+d \\ e+d+z \end{matrix}$ $-S$ $\begin{matrix} g-d+y \\ x-d \\ e-d-z \end{matrix}$ $\begin{matrix} g*+d+y \\ x+d \\ e*+d+z \end{matrix}$ $\begin{matrix} g*-d+y \\ x-d \\ e*-d-z \end{matrix}$

S $\begin{matrix} g'+d+y* \\ x*+d \\ -e+d+z* \end{matrix}$ S $\begin{matrix} g'-d+y* \\ x*-d \\ -e-d-z* \end{matrix}$ S S

$\begin{matrix} g+d+y* \\ x*+d \\ e+d+z* \end{matrix}$ $\begin{matrix} g-d+y* \\ x*-d \\ e-d-z* \end{matrix}$ $\begin{matrix} g*+d+y* \\ x*+d \\ e*+d+z* \end{matrix}$ $\begin{matrix} g*-d+y* \\ x*-d \\ e*-d-z* \end{matrix}$

Appendix 3: Explanation of the Utility Payoffs

1. Government

g	This is the payoff when the government proposes war and the vigilant electorate support. In the game, this payoff is assumed to be the highest value for the government's payoff because aside from obtaining the support from the vigilant electorate, the government also obtains potential resources (i.e. oil) from Iraq and strengthen its authority in the international society by demonstrating its ability to suppress Iraq.
g^*	This is the payoff that the government obtains when it proposes war and the lax electorate support. In the game, this is assumed to be second highest value for the government's payoff because the game assumes that the support from vigilant electorate has higher value than that of lax electorate.
$-g$	This is the payoff that the government obtains when it proposes peace. It is valued negative because the government will neither obtain potential resource (i.e. oil) from Iraq nor strengthen its authority in the international society.
g'	This is the payoff that the government obtains when it proposes war and the vigilant electorate do not support. This is smaller than the payoff "g" because the government does not obtain support from the vigilant electorate.
$g^{*'}$	This is the payoff that the government obtains when it proposes war and the lax electorate do not support. This is smaller than the payoff "g" because the government does not obtain support from the lax electorate.
y^*	This is the payoff that the government obtains if the media sends information about Iraq and weapons of mass destruction sensationally because by sending out these information, the media is supporting the government proposal.
y	This is the payoff that the government obtains if the media sends information about Iraq and weapons of mass destruction seriously because by sending out these information, the media is supporting the government proposal. This payoff is smaller than the payoff "y*" because the game assumes that the government considers the media's sensational

	information with more value than the media's serious information.

2. Electorate

e	This is the payoff that the vigilant electorate obtains when it support the government's proposal.
$e*$	This is the payoff that the lax electorate obtains when it support the government's proposal. This payoff is smaller than the payoff "e" because the game assumes that the support from the vigilant electorate has higher value than that of the lax electorate
$-e$	This is the payoff that the vigilant electorate obtains when it does not support the government's proposal. This payoff is valued negative because the game assumes that it has to go through problematic procedure when it does not support the government's proposal (i.e. protesting).
$-e*$	This is the payoff that the lax electorate obtains when it does not support the government's proposal.
z	This is the payoff that the electorate obtains when the media sends information seriously and it supports the government's proposal because the electorate is more aware about the danger of Iraq and of weapons of mass destruction by hearing the news from the media.
$z*$	This is the payoff that the electorate obtains when the media sends information sensationally and it supports the government's proposal because the electorate is more aware about the danger of Iraq and of weapons of mass destruction by hearing the news from media. This payoff is higher than the payoff "z" because the game assumes that the sensational information can attract more attention from electorate than the serious information.
$-z$	This is the payoff that the electorate obtain when the media sends information seriously and it does not support the government's proposal because the electorate' opinion is conflicted with the media's information.

-z*	This is the payoff that the electorate obtain when the media sends information sensationally and it does not support the government's proposal because the electorate' opinion is conflicted with the media's information.

3. Media

x	This is the payoff that the media obtains when it sends information seriously because it amplifies the electorate' wariness against Iraq and weapons of mass destruction.
x*	This is the payoff that the media obtains when it sends information sensationally because it amplifies the electorate' wariness against Iraq and weapons of mass destruction. This payoff is bigger than the payoff "x" because the game assumes that the sensational information can attract more attention from electorate than the serious information.

4. For all the players

d	If the government proposes war and weapons of mass destruction exist in Iraq, or if the government proposes peace and weapons of mass destruction do not exist in Iraq, all the players obtain this payoff for correctly discovering the truth of the existence of weapons of mass destruction.
-d	If the government proposes war and weapons of mass destruction do not exist in Iraq, or if the government proposes peace and weapons of mass destruction exist in Iraq, all the players obtain this payoff for not discovering the truth of the existence of weapons of mass destruction.

5. Magnitude of the payoff variables

1. $g > g^* > g' > g'^*$

2. $y^* > y$

3. $e > e^*$

4. $z^* > z$

5. $x^* > x$

6. $g > d > g^*$

7. $2g^* + y^* < 2d$