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A Predictive Game Theoretic Model to Assess US - Russian Response to an Islamic Safe-Haven in the Caucasus Region

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A PREDICTIVE GAME THEORETIC MODEL TO ASSESS US - RUSSIAN RESPONSE TO AN ISLAMIC SAFE-HAVEN IN THE CAUCASUS REGION

by

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ABSTRACT

A PREDICTIVE GAME THEORETIC MODEL TO ASSESS US - RUSSIAN RESPONSE TO AN ISLAMIC SAFE-HAVEN IN THE CAUCASUS REGION.

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The thesis examines possible US and Russian policy decisions following the establishment of an Islamist safe-haven in Chechnya. Conflicting national policies affect the possibility of a negotiated settlement. Domestic and international political considerations constrain the decision-making of the two nations. The author applies game theory to examine the sequential decision-making of the two nations. The extensive form model draws outcome payoff values from a bounded uniform distribution. This approach naturally models uncertainty; and, it allows repeated probabilistic instantiations of the model. These instantiations produce a range of solutions. The most likely outcome was a negotiated settlement, generally following a tit-for-tat strategy. The second most likely outcome was a conflict initiated by the US. *What-if* scenarios were used to explore the model. The scenarios illustrate the flexibility of the model. The modeling approach developed in the thesis can be adapted to study other international conflicts. The quantitative data, outcome payoff ranges, was contrived by the author following an analysis of the literature. While the model developed in the thesis is repeatable, similar outcomes assume the would-be modeler is in analytical concurrence with the author. Thus, the development of unbiased preference indices is identified as an area for future consideration.

ACKNOWLEDGMENTS

First, I acknowledge the herculean contribution of my thesis committee: Drs. John Sokolowski, Catherine Banks and, Andrew Collins. Throughout this process they have provided invaluable insight, motivation and hours of monotonous editing. Without their guidance the end product, this thesis, without doubt would have ended up an incomprehensible collection of facts, opinions and conclusions dispersed over numerous pages. They took on this effort, my professional development, without reservation, hesitation or subsequent protest. For their assistance, guidance and commitment, I offer a final and lasting, "Thank you."

Second, I thank my wife Jennifer, and our children, who allowed me to write yet, "one more paper." And, I am indebted to my parent's for their instilling in me a sense of drive, commitment, self-sufficiency and honor.

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CHAPTER ONE

INTRODUCTION TO THE PROBLEM

This thesis takes a mixed methods approach to research and analyze of the likelihood of a new Islamist safe haven and conjectures a response by the US and Russia (as developed by Sokolowski and Banks) [1]. The first two chapters are qualitative in nature, and the third and fourth chapters are quantitative in nature. The qualitative portion has a heavy treatment of relevant history, international relations and strategic theory. The quantitative portions use engineering and mathematical concepts to construct a meaningful abstraction through which the research question can be examined.

In addition to posing the research question, the initial chapter of the thesis provides the motivating force for the research. It explains why an alternative Islamist safe-haven is needed and why the Muslim enclave of the Caucasus might be a likely location. Subsequently, this chapter examines US and Russian concerns within the Caucasus. These considerations are expounded upon in the second chapter. Arguments in the first two chapters provide the basis for policy conflict between the US and Russia. Namely, what is the appropriate anti-terrorist response given the establishment of an Islamist safe-haven in Chechnya? US and Russian decision-making is modeled in chapter 3 using game theory. Specifically, what will the two nations do when confronted with the realization that their opponent plays a role in the eventual outcome? The research question is: ***Will the US use force to eliminate an Islamist threat in Chechnya despite the region being within the Russian sphere of influence (SOI)?*** [1]

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[1] Citation format for this manuscript is taken from the Journal of Defense Modeling and Simulation

1. THESIS AND RESEARCH QUESTION

The Global War on Terrorism has created limited geopolitical congruence between two historical adversaries, the US and Russia. Russia's assistance in the opening stages of the US - led attack on Afghanistan was motivated by a desire to eliminate a mutual enemy – transnational Islamists. The contemporary Islamist threat has been the Taliban and Al Qaeda, originally located in Afghanistan. This shared national security threat has led to limited policy congruence between the US and Russia. Though congruence of policy has had some success globally, regionally the policies of these two nation states are colored by opposing national interests. Each nation suspects that left to its own, its competitor would attempt to re-make the region in its own best-interest.

The Caucasus region is important to the US and Russia because of: 1) its strategic energy reserves; 2) its geographic proximity to NATO efforts in Afghanistan and; 3) its strategic proximity to the southern border of Russia. An Islamist safe-haven in the Caucasus could present a threat to both states. For Russia it could herald continued instability on its southern periphery and increasing Islamic influence within traditionally Slavic Russia. For the US this discovery could force a policy change by threatening the existing regional balance of power.

The relocation presumes that operations in Afghanistan, Iraq, and other fronts have begun to dislocate Islamists from their traditional sanctuaries. For the US this operational success comes with the attendant realization that the Caucasus is within Russia's traditional sphere of influence. Thus, a safe-haven in the Caucasus is deemed unacceptable by both states. Policy deliberations could be difficult, and likely more so for the US given Russia's sense of strategic distance. Traditionally, Russia has been keen

to events in the Northern Caucasus and would likely prefer the US not interfere within its sphere of influence. This single consideration could stymie swift US action.

For this thesis a safe-haven represents a secure location for an Islamist cadre and a limited force generating capability. Since such a safe-haven exists on the operational / strategic boundary it provides operational planning, acts as a geographic base, and enables the development of strategic communications. This begs the questions: "Why does a safe-haven need to exist" and; "Why the Caucasus"?

a) Why a new Islamist safe-haven?

Changing US strategy in Afghanistan and the Iraq Theater(s) of War (TOW)

Multi-national military operations against Islamists have been successful on a number of fronts. Efforts to disrupt financial support to Islamists have been successful. Violence in Iraq is down from its height in 2006/early-2007. These successes have led to renewed efforts in Afghanistan. The Obama administration has deployed an additional 17,000 combat troops and 4,000 advisors to Afghanistan. As of the 4th of September 2009 an additional troop increase beyond the 21,000 already allocated for the Afghanistan Theater has not been ruled out. The concentrated effort in Afghanistan and attention to crucial regional states like Pakistan solidify a new strategic plan focused on the elimination of Islamist activity in Afghanistan and north-west Pakistan.

Increased operational tempo in Afghanistan

The war in Afghanistan continues after almost seven years; for all practical purposes Afghanistan has been in a state of violent conflict for thirty years. The strategic ends being sought by the US and International Security Assistance Forces - Afghanistan

(ISAF) differ from those of the Soviets circa 1979. During the Soviet intervention the military goal was the destruction of Afghan resistance through the application of military might. ISAF approaches the governance problem from the opposite direction. The ISAF in coordination with the Afghan government intends to defeat insurgents through reconciliation. To this end local security is a parallel line of operation. Population centers are secured with increasing ISAF and Afghanistan National Security Force (ANSF) capacity.

ISAF operations conducted in Helmand province in July 2009 signaled an operational change in the Afghan conflict. Helmand province is a Taliban stronghold and the center of opium production. Operations in Helmand province, ahead of the Afghan presidential elections, were either a preemptive spoiling attack designed to disrupt local insurgent tactical plans or they were decisive strikes meant to hinder the operational capabilities of the Taliban regionally. Either way the increased operational tempo of ISAF in conjunction with the planned increases in the number of ANSF could likely force organized Taliban insurgents into a strategic defensive.[2] As Islamist resources are threatened or diminish, the need for a new safe-haven could increase. The decrease in resources is the result of: a) political reconciliation and ISAF/ANSF operation; b) decrease in tangible resources (weapons, material, money and poppy) and; c) continuing pressure in Pakistan.

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[2] In *On Protracted War*, Mao Tse-tung identified three stages of an insurgency: the strategic defensive, the strategic stalemate, and the strategic offensive-counteroffensive. Free copies available on-line at http://www.marx2mao.com/Mao/PW38.html#s1

Increased Pakistani effort: domestic blow-back and the international response

Since the attack in Mumbai, India, Pakistan's role in defeating Islamists has received increased scrutiny from other nations. The US has signaled that tacit compliance with NATO activities is no longer good enough. The US views Pakistan as an important front in the conflict against radical Islam. At the macro-level Pakistani opinion seems less certain. But, Islamist attacks at home have made terrorism a domestic concern in Pakistan.

The attack on a police academy in Manawan, Pakistan had limited tactical success for Baitullah Mehsud's Tehrik-i-Taliban Pakistan (TTP), though it could likely become a strategic failure. Few police were injured and the attack was handily dealt with by Pakistani police special operations units. It is expected that this event has reinforced the need for vigorous action in Pakistan in order to defeat Islamic terrorists. And, it has steeled the resolve of citizens and politicians while providing a needed victory for the Pakistani security forces [1]. Later, in August 2009 Baitullah Mehsud was killed in an Unmanned Ariel System (UAS) attack. He was likely targeted as a result of his increasing notoriety in the region. Baitullah Mehsud was killed by a US drone; it is unclear as to the degree of cooperation and integration with which the US and Pakistani security forces operated during the attack.

In a speech delivered to the United State Congress on 22 April 2009 the US Secretary of State Hillary Clinton made the case that the Taliban and Islamists pose a threat to the Government of Pakistan. This speech was not a policy brief for the US Congress. It was a message for Western policy makers - Pakistan needs our help. The day prior, the Taliban reported that they were in control of a sizeable amount of the

Buner district of Pakistan, approximately 60 miles from Islamabad [2]. This speaks to the ideological confusion in Pakistan. On one hand the citizens see themselves as (Sunni) Muslims who should not join an armed conflict against other (Sunni) Muslims. And, religion aside, they do not want to be a patsy for US regional goals. On the other hand, the brutal rule of violence and chaos that the Taliban brings is not palatable either [3]. In short, it would appear that maintaining a transnational Islamist organization in Pakistan will become increasingly more difficult. And, moving such an organization back into Afghanistan would be worse. The United States Central Command (CENTCOM) is managing US efforts in both countries and it seems be improving their ability to coordinate operations within and between the two nations. Thus, this research proffers that a new safe-haven is required.

Summary: Why Islamists need a new safe-haven

Al-Qaeda, the Taliban and other fringe Islamist groups in Pakistan are under increasing pressure, resulting from the confluence of six factors.

1.) increasing troop deployments to the region. Beyond the increase in operational capacity this increase demonstrates US resolve.

2.) increasing attention from NATO which ensures that events within Afghanistan and Pakistan do not go unnoticed. And, this conflict is occurring as NATO transforms from an alliance once united against communism to one now against global threats (such as transnational terrorists) [4].

3.) shifting US foreign policy priority of effort from Iraq to Afghanistan

4.) increasing pressure from the Pakistani government and citizenry; both of which are unwilling to accept continued strife and instability.

5.) surging UAS attacks into safe-havens within Pakistan's tribal region disrupting the operational level of the "organization". These attacks continue, thus unabated by the public protestations from the Pakistani government. As a result, the Taliban may be advancing deeper into Pakistan to: 1) out-range US UASs and; 2) add considerations regarding collateral damage to the equation. This increases operational risk for US commanders. The Taliban believes that US commanders will be less likely to attack Taliban targets in urban sprawl capital. But, this places the Islamists and their foreign fighters in closer proximity to local security forces.

6.) depleting available funding to international Islamic terrorist organizations via the efforts of the US, NATO and Russia [5]. Operations have been traditionally funded through the illicit drug trade (opium) and contributions from governments and non-governmental entities. Acquiring funding through both sources has become more difficult.

For these reasons the author contends that it is reasonable to expect that Islamists may relocate from their established safe-havens in Saudi Arabia, Iraq and Iran, and Islamic Central Asia (Afghanistan and Pakistan) to a Muslim enclave within the Russian sphere of influence. Having experienced increasing political and military pressure in Afghanistan and Pakistan and the pernicious effect of US UAS attacks, a safe-haven inside the Russian sphere of influence offers some unique advantages.

b) Why the Caucasus

The weak and failing Muslim states in the Caucasus region are rife for political upheaval. The author contends that there are many similarities between Afghanistan circa 1979 and Chechnya 2009. This research includes all of the Caucasus states, but the author supposes that the safe-haven will be in Chechnya. This supposition is supported by the literature and is elaborated upon on in Chapter Two.

Regional History

With the exception of parts of Chechnya and Dagestan, all of the Caucasus was once part of either the Ottoman or the Persian Empire, hence the proclivity of Islam in the region. The Russian Empire was able to wrest control of much of the Caucasus from the Ottoman Empire and the sovereign Shiite state of Persia (Russo – Persian) wars. This began what has been dubbed the Great Game, a strategic rivalry between Russia and Great Britain.

Afghanistan, Georgia, and Chechnya were key strategic terrain during this period. Afghanistan provided routes from Russia to India, which also served as transit routes for trade or attack. Georgia provided ports and access to the Caucasus region and Russia's southern flank. Strategic insecurity led to the Caucasian War (1817-1864). After the war the states of Caucasus remained under the control of Czar Nicholas II until World War I.

In 1917 Lenin lost control of the Caucasus states following the Russian Revolution. Red Russia began to assert control over the various Caucasus states in 1920. By 1924 most had been integrated into the USSR. The states of the Caucasus suffered under Stalin, partly the result of the Caucasian/Chechen insurrection of 1940, which

resulted in the forced relocation of most ethnic Chechens and many other peoples of the Caucasus. Shortly after the fall of the USSR on December 25, 1989 the Southern Caucasus became the sovereign states of Armenia, Azerbaijan, Georgia and Nagorno-Karabakh.[3]

This was followed by inner conflict between Azerbaijan and Armenia. The two former oblates fought over Nagorno-Karabakh. In 1994 Russia becomes entangled in a conflict in Chechnya. The conflict unfolds in two stages. The First Chechen War ended in 1996, and a Second Chechen War was from 1999 to 2008.

Culture, religion, ethnic considerations in the Northern Caucasus and Russia

The Caucasus region is a complicated, heterogeneous collection of states. Some states are sovereign, and others are districts of the Russian Federation. Ethnicity, geography, history and social conditions have created a region replete with near-constant struggle.

Islam has been common in the Northern Caucasus since before the Caucasian Wars, and Russia is now undergoing its own Islamization. Not only are immigrant populations beginning to grow in traditionally Slavic portions of Russia, Slavs and "traditional" Russians are becoming Muslim at an increasing rate. Fundamental Islamists point-out that Islamic temperance and matrimonial customs could herald the solutions to Russia's increasing problems with drug abuse and alcoholism, while polygamy, sanctioned by Islam, offers a way to halt population decline [6]. Russia, like many other nations, is undergoing a demographic shift. In the future traditional Slavs will be

[3] Nagorno-Karabakh is internationally unrecognized but autonomous

outnumbered by Asians and Central Asians. Likewise, the Orthodox Church is on the decline and Islam is on the rise. These two facts have political implications for southern Russia and the nation as a whole.

US economic interests in the region

US interests rest in-part on the energy reserves of the Caspian Basin and their transport mechanisms the Baku-Tbilisi-Ceyhan (BTC) and Baku-Tbilisi-Erzurum (BTE) pipelines. Oil from Azerbaijan a "pro-western", Muslim, non-OPEC member flows through these pipelines, from Georgia into Europe and the global energy market[7]. The US also benefits from increasing economic and political integration between Eastern and Western Europe. Specifically, this integration reduces the leverage that Russia has on Eastern European governments. The latter issue troubles Russia; the former is cause for much greater consternation. Both the BTC and BTE pipelines were built specifically to bypass Russia despite increased costs and a circuitous route. Both of these pipelines originate in Baku, the capital of Azerbaijan. Azerbaijan's northern neighbor is fellow Muslim state, Dagestan. Azerbaijan is a weak US proxy in the region. US – Azeri ties were stronger in the 1990s than they are today.

It is fair to note that Azerbaijan is not a bastion of democratic hope, nor a crusader of enlightened, Western ideals.[4] Azerbaijan presents a façade of democracy, a government in which secular and political moderation is maintained by the severe repression of political Islam [8]. The US seems less concerned with Azerbaijan than with

[4] Many authors believe that US policy towards Middle Eastern regimes has placed the United States in the myriad conflicts that continue to boil in and around the Arabian Peninsula. A particularly potent example is offered by Andrew Bacevich, *The Limits of Power: End of American Exceptionalism.*

the influence held by the Northern States. From the US perspective Azerbaijan's neighbors to the north represent a growing regional threat. Unrest and violence ebbs and flows from Chechnya to Dagestan and might well flow into Azerbaijan. Upheaval in Azerbaijan could have an effect regionally on Western policies and globally on oil dependent economies.

Russian regional economic and security concerns

From the Russian perspective they need neither explain, nor justify their policies towards a region that was once part of the USSR and lies on their southern border. Russian politicians have shown the ability to convert political strife between Russia and the US into domestic, political capital by simply ignoring US wishes [9]. Combining the fact that the Caucasus are geographically Russia's *Mexico* with the realization of tremendous energy potential in the region serves to harden Russian policy regarding the region.

Significant oil reserves have only served to make political issues more intractable. The US and Russia both have reasonable claims to legitimate interests in the region. But, the reader should consider the role that potential energy reserves play in these interests. The US is the world's largest net importer of oil, while Russia's economy is dominated by energy exportation. *Cheap oil is good for the US and bad for Russia.* Russia's security concerns go beyond pure economics.

The near continuous instability in the region represents a concern for Russia. The Caucasus forms Russia's southern flank. In the Northern Caucasus Sunni Muslim Dagestan, Chechnya, and to a lesser extent Ingushetia, continue to be security problems

for the Russian Federation. Chechnya is considered a destroyed state. Instability from this region could migrate into the Slavic, Eastern-Orthodox interior of Russia and affect important Southern cities such as Volgograd. Likewise, instability in the region can affect US regional partners such as Azerbaijan and Georgia, thus drawing US attention. However, recent history seems to indicate that the US and Russia have paid little attention to the other's concerns. A case in point is the Russian invasion of Georgia in August 2008.

And, as of July 2009 US policy continues to be that Georgia should be allowed to become a member of NATO at some future point, a policy that Russia has vehemently rejected. The complicated relationships among the nations of the Caucasus, the US, and Russia could explain why so little seems to change. And then there is Armenia.

Armenia is the Russian proxy in the Southern Caucasus. Russia and Armenia have had good relations since before the February Revolution (1917). The same cannot be said for Russian – Georgian relations. Georgia's Rose Revolution in 2003 and its subsequent efforts towards Westernization have rekindled historical hostilities between Russia and Georgia. While the origin of this hostile relationship is unknown it appears to have increased in the last three decades. Eduard Shevardnadze, former Minister of Foreign Affairs and the Politburo was frequently publically criticized by then Prime Minister Boris Yeltsin. And, during Georgia's conflicts with its break-away republics of Abkhazia and South Ossetia, Russian troops supported the break-away republics. To the point, Russian forces allegedly led the separatist attack into the Abkhazian capital. Later, the Russian-Georgian War of 2008 erupted as a tangible manifestation of the hostilities

between the two nations. The conflict did not spread. It lasted less than two weeks but the political and physical destruction in Georgia was apparent. In an unexpected turn of events, even though Russia was still conducting military operations in Chechnya, *Chechens joined with Russia in the war against Georgia.* This is more evidence that Pro-Western states and Georgia in particular, are not liked in the region.

In summary, Russia is concerned with three things. First, the economics of the global oil market, by bypassing Russian territories the BTE (Azerbaijan – Georgia – Turkey) and BTC (Azerbaijan – Georgia – Turkey) pipeline does not provide Russia a transport tax on oil removed from the Caspian Basin and sold in the European market. Second, instability in the region is a security concern for Russia because it could spread into Russia. Third, the instability and US attention in the region due to the US's has political ties with Georgia and Azerbaijan: Azerbaijan produces the oil Georgia provides the ports. [5]

Uncomfortable realities

The above analysis concludes the following: given the volatility of US – Russian relations in the Caucasus region and the expected future destruction or strategic isolation of Islamist safe-havens in Afghanistan and Pakistan, there exists the potential for an operational relocation of Islamist safe-havens to the Caucasus.

[5] The ports of Poti and Batumi were among the last places for the withdrawal of Russian forces following the conflict in 2008.

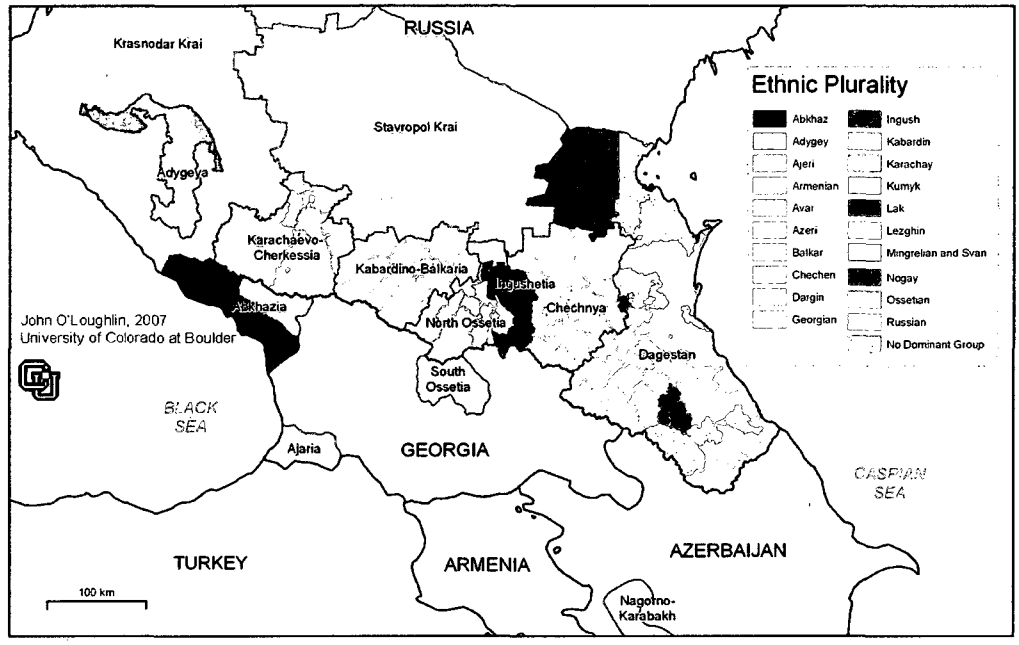

Figure 1. Map 1 : The Caucasus states
Source: John O' Loughlin and the University of Colorado at Boulder, 2007

Chechnya could become the next Islamist safe-haven. If this occurred the new safe-haven would establish a base for jihad on the border of Europe and Central Asia (Figure 1). It would be within the reach of NATO and the US, but wholly within the Russian sphere of influence. While there are ethnic and cultural differences between Arab/Persian Muslims and European Muslims, historically this has not precluded them from working towards shared goals. In fact Chechnya and the Taliban have a shared history going back to the early 1990s (which is will be discussed in more detail in Chapter Two).

Establishing a base in the Caucasus could be beneficial for Islamists for many reasons. Probably the most apparent reason is its geopolitical location relative to Russia. A US/NATO attack could be cost prohibitive for diplomatic and political reasons. From

a political stand-point any action against Islamists in the Caucasus would be slowed by diplomatic wrangling with Russia in the UN. From a diplomatic stand-point, NATO sanctioned operations in Afghanistan goes without asking. While diplomatically unsettling, disregarding claims of national sovereignty while launching UAV attacks into Pakistan is quasi-permissible. But, conducting military operations in Chechnya is something else completely. Russia wants the final say in the region. This nuanced diplomatic perspective of unspoken rules regarding Afghanistan, Pakistan, and Chechnya is understood and could act as barrier to coalition forming aboard and policy formulation in the US.

Though security threats may be present in the Caucasus neither the Russian response nor the US response should be considered a *fait de accompli*. An aggressive US plan would tempered by anticipated Russian contention. Similarly, Russian actions could provoke a US response. Conflicting policies limit what Russia and the US can do and expect to gain in the region.

c) Hegemon v. Hegemon: Conflicting policies regarding the Caucasus

Russian and US policy consensus goes only so far. Though there is general agreement on certain broad, global issues there is disagreement on the ways and means used to achieve these common national ends. Specifically, the two nations disagree on the means used to bring stability to the Caucasus region and the US role in the Caucasus. US – Russian relations have been good when elected officials were willing to focus on common interests, but these interests seem to be few [10]. Nuclear arms reduction is one example in which common interest has helped to align national policies. US and Russian

policies differ on many issues; they can be, diametrically opposed or mutually exclusive. This appears to be the case in the Caucasus region. In this volatile region US and Russian policies conflict, both pursue policies that increase their perceived national security but as political theorist Joseph Nye points out one nation's security often results in another's insecurity [11].

US political interest in the region

Beyond the economic interests discussed earlier, the Caucasus region has strategic value based on its geographic location relative to Russia. Control of the Caucasus could provide the US political leverage in its dealings with Russia. With this perspective it seems reasonable to presume the US has chosen its partners based on their geographic location as well as on their economic potential.

While not a global super-power Russia still holds sway in the region and it could create an Eastern European block to challenge NATO and the EU. From the US perspective, Russia is still the global antagonist and a counterpoint to US power. Containing Russian power is in the interest of the US. As alluded to Georgia and Azerbaijan play a role in US regional policy formulation. The US has a national interest in both states. The US supports the eventual inclusion of Georgia and Azerbaijan, along with the Ukraine, into NATO and the EU. Both institutions, NATO and the EU, threaten Russia's military and economic dominance within the region.

The US continues to consider sponsoring Ukraine's admittance into NATO. The US also seems unwilling to drop their support for Georgia's NATO aspiration. Current

US policy (as expressed by Vice-President Joseph Biden) takes a wait-and-see approach towards their membership.

The US and Azerbaijan have political ties. Azerbaijan is a member of the Partnership for Peace (PfP). It is working towards European Union (EU) membership through the EU-Azerbaijan Partnership and Cooperation Agreement. It has provided troops for NATO operations in Kosovo and Afghanistan. It was a force provider during the early stages of the Iraq War. And, it is a non-OPEC nation, and the originator of the two major pipelines in the region. However, since 2002 Azerbaijan has pursued a neutral policy towards Russia and the US, likely because this would seem to be in Azerbaijan's best interest.

Azerbaijan understands the role it plays in Russia's plans to preserve its influence over the Southern Caucasus. Azerbaijan also understands that they are of interest in the larger global community because of their hydrocarbon reserves. Finally, though Azerbaijan plays both sides they realize that Russia still maintains close ties to Armenia. And, Russia attacked Georgia for their aggressive actions against South Ossetia. This could signal Russian intervention on the Armenian side in the event of a second Nagorno-Karabakh conflict. In the end, Azerbaijan's future is tied to its ability to produce oil and Georgia's ability to get it to port. While Azerbaijan is happy with neither President Saakashvili's actions in the summer of 2008, nor the US's response, there isn't anything practical that they can do about it [12].

US – Georgian relations and US policy goals were diminished by the recent (2008) Russian – Georgian War. As one scholar put it the most troubling political

outcome of the war was Washington's inability to control Georgia's President Saakashvili and Russia's "proclivity to see hard power as the true currency of international relations" [13]. Georgia's President Saakashvili views NATO and the European Union as institutions for democratic change in Georgia. Prior to the conflict both issues were being "fast-tracked". In 2006 NATO offered an "Intensified Dialogue" to Georgia, which in practical terms represented progress towards eventual full membership.

Georgian conflicts in South Ossetia and Abkhazia complicated Georgia's NATO integration. Presumably, the war with Russia has stopped Georgia's integration into NATO for the time being. Georgia continues to be an important US ally in the region. The BTC / BTE pipelines run through Tbilisi. And, Georgia provides two large Black Sea ports strategically situated between the Balkans, Eurasia, and the Arabian Peninsula.

The US has limited influence in the Northern Caucasus. With the exception of Chechnya, all of the states in the Northern Caucasus are members of the Russian federation. Chechnya became independent in 2003. Historically the US has rarely objected to Russian actions there. One notable exception was President William Clinton's reference to the Second Chechen war as a "civil war." Though he was criticized for his statement it was not inaccurate. First, Chechnya has not been declared independent. And second, radical Muslims groups from Chechnya had conducted numerous attacks in Dagestan with the expressed purpose of "liberating" Dagestan from the "corrupt" Dagestani government.

In summary, the US understands four fundamental facts: 1) Russian policy in the Caucasus is based on economic realities as well as geo-political considerations; 2) the US and Russia still view each other as geo-political competitors with proxies in the Caucasus; 3) an Islamist safe-haven in the Caucasus is in Russia's traditional sphere of influence and; it would literally be on Russia's southern border. And, any action taken against it could have significant consequences, and; 4) the balance of power in the region is a zero-sum game. A loss suffered by the US is a gain for Russia. As such, some instability in the Caucasus could be beneficial for Russia. Thus, Russia might be unwilling or unable to take decisive action against an Islamist safe-haven in Chechnya.

Russian interests and policies in the region

Without too much simplification it can be reasonably stated that Russian policies are generally contrary to those of the US. Any gain in influence by the US has an attendant decrease in influence for Russia. Where political influence is considered US and Russia are playing a zero-sum game.

Russia see's the BTC/BTE pipeline as a Western economic tool to provide the EU oil while preventing Russia from profiting from transit rights. These pipelines limit Russia's ability to influence European energy markets. Recently Russia began negotiations with Azerbaijan for the transportation of hydrocarbons through Russia (South Stream pipeline).

NATO membership for Georgia and Ukraine continues to be a point of contention. NATO was created specifically as a counter to Soviet power in Europe.

Admitting Georgia and/or Ukraine into NATO would literally place NATO on the border of Russia.

Russia maintains close ties with Armenia, Azerbaijan's rival. The semi-autonomous Republic of Nagorno-Karabakh was the result of Armenian-Azeri War of 1991. Russia supported the succession of Nagorno-Karabakh from Azerbaijan prior to the war. Russia has supported the Georgian break-away republics of South Ossetia and Abkhazia. Russian troops organized and led separatist attacks on the Abkhazian capital of Sukhumi in 1994. They also provided tactical air support with Russian aircraft striking Georgian forces in Abkhazia [14].

In short, observable Russian policy is one of pragmatism. What is good for Russia is right for the Caucasus. And, a large collection of micro-states caught up in local conflicts is better than a small group of states united against Russia. Individual nations/states can fight among themselves along as they do not threaten Russia's economic or social stability. In fact, in-fighting may be beneficial for Russia. The splintering among the states makes them weaker and more susceptible to Russian influence. Of note is Russia's support for the separation of Abkhazia and South Ossetia from Georgia as well as the Nagorno-Karabakh separation conflict between Armenia and Azerbaijan.

US – Russian relations from 1989 through July 2009

The disintegration of the Soviet Union on 25 December 1989 was seen as a diplomatic victory for the US. The US and NATO politically defeated the Soviet Union. In the years immediately following the dissolution of the USSR and the creation of the

Russian federation Russia was dependent on (predominantly US) foreign aid. This provided the US with considerable leverage over Russian policy [15]. As Russia recovered and energy prices climbed Russia became less dependent on foreign aid. Russians are resentful of excessive, previous Western involvement in their internal politics and local issues. Russians believe the US exploited Russian weakness [16].

The ten years beginning in 1991 and ending in 2001 saw Russia involved in numerous conflicts in the Caucasus region. The US generally divested itself of any interest in the area. The Russian – Afghan War had ended in February 1989. In 1991 the US and Russia officially ended support to their proxies in Afghanistan [17]. As the Southern Caucasus states moved towards independence, factions within these states moved for even more independence. This created the enduring separatist conflicts in the Caucasus. These conflicts began to resolve in 1994. The first Russian – Chechen War began in 1994. The second Russian – Chechen War began in 1999. US policy explicitly recognizes these conflicts as internal issues. As mentioned earlier, in August 2008 Russia attacked Georgia after Russian soldiers in South Ossetia were killed by Georgian artillery. Russia stopped short of taking the capital and sacking the government. But, they entered peace talks in procession of the Georgian ports of Batumi and Poti.

Russian soldiers were originally deployed to South Ossetia's as observers following accords between Georgian and South Ossetia. However, they were supposed to have redeployed to Russia in 1994. Russian actions were viewed as reasonable and justifiable by many citizens of the region. But, they were regarded as heavy-handed and excessive in the West [18]. On the other hand Georgia has yet to answer for war crime

accusations. And, beyond these accusations the proximate cause for the conflict was presumably unobserved artillery fire from Georgian units into South Ossetia, technically a region of Georgia. In the end, Russia gained regional influence while arguably losing a nominal amount of influence in the larger global community. The war was ruinous for Georgia. Oddly enough, eight months later, in April 2009 President Medvedev declared that Russian operations in Chechnya were complete. This single action closes a chapter in Russian history, a Chechen conflict that traces its origin back to the fall of the USSR. It was the last such issue that Russia had to come to terms with.

Events of the last two years seem to indicate that Russia has embarked on a new policy, to remake the region to better suit its needs. Through all of this Russia is asserting its regional influence while reminding the US that Russia might not be able to stop US ambitions globally, but that Russia can make things much more difficult [19].

2. RESEARCH METHODOLOGY

The intent of this research is to examine plausible Russian and US policy reactions to the establishment of a strategic Islamist safe-haven. This thesis focuses on the Northern Caucasus Muslim enclave of Chechnya.

The research is divided into five chapters. The above first chapter serves as the introduction to the research topic. The second chapter is the qualitative research and literature review. This chapter illuminates existing qualitative research that is relevant to the topic and the modeling paradigm. The third chapter is the quantitative research, the model definition and creation. Results will be reported in Chapter four. And, Chapter five concludes the research.

Notes

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CHAPTER TWO

REVIEW OF THE LITERATURE REGARDING CHECHNYA, POLITICAL ARRANGEMENTS IN THE CAUCASUS, AND GAME THEORY

This chapter expands on the concepts put forth in Chapter One. Chapter One answers the questions: "Why is a new safe-haven required" and "Why the Caucasus." Chapter One also provides a macro-level view of US and Russian national strategic policies specific to the Caucasus. Chapter Two has a narrower scope pre-supposing that Islamists will relocate to Chechnya; it sets about the task of deducing why this could occur. It proposes policy considerations that could inform US and Russian policy subsequent to the establishment of the new safe-haven in the Muslim enclave of Chechnya. Chapter Three will introduce the quantitative model. Chapter Three uses the analysis to establish US and Russian preferences; and, to further adapt an existing extensive form Game Theory model. It concludes with model and simulation development.

The following discussion identifies contemporary events that could provide motivation for Islamist relocation. It also examines Islamic Jihad, its creation and role in Afghanistan, and its links to the First and Second Chechen Wars. Accordingly, an overview of Chechen history follows, placing emphasis on the period following Chechen secession from Russia, and the formation of the Chechen Republic of Ichkeria. The thesis provides a qualitative assessment of US and Russian policy preferences regarding the region. The discussion concludes with the presentation of the quantitative modeling technique used in Chapter 3 of this thesis.

1. CURRENT EVENTS AND THE NEED FOR A NEW STRATEGIC SAFE-HAVEN

American forces are engaged in what George Friedman characterizes as the Fourth World War. It is a war against radical, militant Islamic ideology. As it spreads its intensity increases. It threatens established order in the Middle East and Central Asia. This conflict represents an emergent threat [1]. This might seem to be an odd statement, since by some accounts this war has been going on since 1991. The West continues to expend significant resources to secure shaky states and halt the advance of Islamists. This fact supports the author's contention that from the US point of view a threat requires a response.

Lord Palmerston recognized that alliances are built on common interest. He did not believe in the notion of permanent alliances or permanent enemies. In the past the US and Russia have joined forces against Islamists and militant Islam. But, the results have rarely been substantive and more often US and Russian relations have been defined by conflict, not cooperation. The US supported the Mujahedeen in the 1980s. In the 1990s the US provided no support to Russia during the Chechen conflicts. Russia did provide some support to the US during the initial phases of the US – Afghan War. Russia did not support the US war in Iraq; and they do not seem to feel any obligation to support US / NATO operations in Pakistan.

Islamic jihad, as a national security threat, was created more than thirty-years ago. It is the result of US and Russian foreign policy in Central Asia and the Arabian Peninsula. The general consensus holds that the current war in Afghanistan now enjoys parity if not supremacy when it comes to the US resourcing of operations in Iraq and Afghanistan. The US is beginning a troop draw-down in Iraq and a troop increase in

Afghanistan. Although Russia does not provide men or military material support in Afghanistan, it does have an interest in the outcome of the conflict.

Afghanistan borders the pro-Russian Islamic states of Kazakhstan, Turkmenistan and Uzbekistan. Afghanistan is in close proximity to the strategic energy reserves of the Gulf States. However, prior to the break-up of the Soviet Union, Afghanistan and the USSR shared a 2,500 km border. The USSR began its ten year war in Afghanistan in 1979. The objective of the war was the consolidation of power [2]. The US saw the war as an attempt at expansion by the USSR. The US supported efforts against the Soviets, specifically the creation and equipping of the mujahedeen. The official Soviet decision to withdraw forces from Afghanistan was made on 13 November 1986 [3]. In 1988 the Geneva accords signaled the Soviet commitment to withdraw troops, with the last troops departing on 15 February 1989 [4].

The departure of Soviet troops left the mujahedeen without an enemy. Without an evil external force to coalesce animosities tribal and personal anger turned inward. The ensuing chaos lasted years. In 1995 the Taliban gained control of the majority of Afghanistan. The Taliban and al-Qaeda both have their roots in the Soviet-Afghan War.

The US is involved in an eight year war in Afghanistan, a nation that has been in a state of violent conflict for thirty years. While the violence remains, strategies to control it differ.

Figure 2. Map 2 : Provinces of Afghanistan with national borders
Source: http://en.citizendium.org/wiki/Provinces_of_Afghanistan

ISAF operations conducted in Helmand province in the month of July signal an operational change in the Afghanistan conflict. Helmand province is a Taliban stronghold and the center of opium production (Figure 2). Operations in Helmand province, ahead of the Afghan presidential elections are either: 1) preemptive spoiling attacks designed to disrupt insurgent operational and tactical plans or; 2) decisive strikes that will hinder the operational capabilities of the Taliban regionally. These factors, indicative of an increase in operational tempo by ISAF, with the planned increase in ANSF will likely force organized Taliban insurgents into a strategic defensive. Thus, diminishing capabilities, the result of political reconciliation and ISAF/ANSF operations,

combined with a decrease in resources (including the poppy crop) along with continuing pressure in Pakistan serve as motivation for Islamist relocation.

2. ISLAMIC JIHAD AND CONFLICT IN THE CAUCASUS

A straight line links contemporary Islamic terrorists and the Mujahedeen of 1979. US support to the Mujahedeen was limited by Congresses' "power of the purse" this was not the case in Saudi Arabia for either the government, or for the prominent Saudi families such as the bin-Ladens [5]. While the US understood the need for arms and equipment to support the Mujahedeen they did not understand that this was not a war inspired by a national or political identity. Rather it was fueled by Islam. The Mujahedeen viewed the defeat of the USSR as a victory for Islam not a victory for Afghanistan or the West [6].

In 1996 the Taliban gained control of Kabul, the capital of Afghanistan. In 1998 they controlled 90% of Afghanistan [7]. Also in 1988, the Azerbaijan – Armenia conflict began. Shortly afterwards, Russia is involved in a conflict with Islamists on Russian soil, namely the First Chechen War.

In 1992 Chechnya declared its independence as the Chechen Republic of Ichkeria. Armed conflict began in 1994. In 1996 Russian President Putin declares that forces from the Russian Federation are fighting a war against "...global Islamic jihad" in Chechnya [8]. While the Taliban were taking control of Afghanistan, the Chechen militant Shamil Baseyev made at least two trips to Afghanistan in the early 1990s to meet with Emir Khattab, [9] a Middle Eastern Arab that he fought with during the Azerbaijan – Armenian War (the Nagorno-Karabakh Conflict of 1988 to 1994). In 1999 the Russian Chechen

conflict spread to the neighboring district of Dagestan, beginning the Second Chechen War. The Chechen forces were led by Shamil Baseyev and Emir Kattab. This event is characterized as a Russian "civil war" by then President William Clinton [10]. One-year earlier the Taliban in Afghanistan, and the *de facto* independent Chechen Republic of Ichkeria had recognized one another as sovereign states.

The Russian Federation characterizes Chechens fighters as terrorists, whabbists receiving financial support and foreign fighters from the Middle-East. Russia even threatened attacks against Afghanistan for their alleged material support of Chechen rebels. Russia has asserted that this conflict would not end in Chechnya. As it believes the Chechen separatists are motivated by jihad, who believe that the Islamic struggle will only stop when the Caliphate is established, or presumably when radical motivations are removed [11].

A review of modern Chechen history reveals that Chechnya is a volatile region driven by extremes. As a result of this analysis, the author contends, that Chechnya is a possible Islamist safe-haven; and, the case for a Chechen safe-haven is made in the following discussion.

a) The Chechen Wars

The First Russian-Chechen War began in the summer of 1991 when retired Soviet Air Force General Dzhokhar Dudaev began to execute plans to wrest control of Grozny and Chechnya from Russia. The political turmoil of the August 1991 coup, between President Boris Yeltsin and the Russian Parliament gave Dudayev room to maneuver. Some members of Parliament gave their tacit support to Dudayev. Apparently their

decision was the result of a power struggle with then President Boris Yeltsin [12]. Between 1991 and 1994 Dudayev consolidated power and the Russian military began a withdrawal from Chechnya. A Chechen "National Guard" was armed through a combination of post-Soviet military sales, theft, and the capture of abandoned Russian equipment [13].

Armed conflict began on November 26, 1994. Russian Army forces comprised approximately 2,500 infantry and 150 armored vehicles. This force also included an unknown number of opposition fighters, Chechens either not in favor of independence, or not in favor of Dudayev. The Russians planned to envelope Grozny from three-sides. Resistance was expected to be minimal and as such complete plans were not developed. Nor were armored forces properly integrated, approximately one-third of the armored forces left garrison the day before receiving their specific orders on the evening prior to the assault. Dudayev, however, expected a fight and made proper preparations.

Dudayev's intelligence chief had obtained a map that illustrated the Russian plan, to include tactical efforts, phasing, and force numbers [14]. Dudayev's plan allowed Russian mechanized forces into the city center. This proved to be a significant tactical advantage. The utilization of urban terrain harkens back to General Chuikov's defense of Stalingrad. This tactical risk paid off much as it did in 1942.[6] As armored forces progressed deeper into the city center they began to receive anti-armor fire from roof tops and basements. Their infantry support was scattered by snipers. Chechen snipers quickly

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[6] Hitler viewed Stalingrad (modern day Volgograd) as the gateway to Chechnya and the oil resources of the Caspian. In *Too Little, Too Late: An Analysis of Hitler's Failure in August 1942 to Damage Soviet Oil Production* , Joel Hayward quotes Hitler as remarking, "If I do not get the oil of Maikop and Grozny then I must end this war." Grozny was a strategic objective in 1942 (for Hitler) and 1818 for Russia.

disorganized the small infantry units. Those that survived were rumored to have left the fight earlier in order to fill their pockets, looting the surrounding retail stores [15]. What was left of this mechanized force was an unorganized resistance that had been ordered to go to the center of the city and wait.

The First Chechen War continued until the end of August 1996. Grozny played an important role, as a battleground, during almost two-years of on-again, off-again fighting. Grozny would be involved in major combat at least three times. The peace agreement ending the First Chechen War called for a referendum on Chechen Independence to be held five years from the signature date in 2001 [16]. The Second Chechen War began in 1999 with the invasion of Dagestan by wahhabist rebels from Chechnya under the direction of Basayev and Kattab.

Shamil Basayev, regarded as a national hero, held numerous national level political positions in the Chechen government. He had officially resigned from his political post in 1998. This, his second departure from government was the result of increasingly "anti-whabbist policies." There is little doubt that Baseyev's decision was influenced by Emir Kattab [17]. In 1999 President Maskhadov again declared the establishment of a government of "full-fledged Shari'a law." At this time Baseyev claimed that since the President had recognized the authority of the faith over political affairs the President was no longer legitimate. Baseyev contended that Chechnya should be governed by an Imam, a religious leader [18]. On August 2, 1999 whabbists forces associated with Baseyev and Kattab attacked Dagestan. They expected this to be the

opening act in a campaign that would establish a Muslim state from the Black Sea to the Caspian Sea [19].

The operation to "liberate Dagestan" was named for the first Imam of Dagestan and Chechnya, Imam Kazi-Mahomed. It included a declaration of war on the grounds that the Chechen fighters had come to liberate the people of Dagestan from the "murderous government of Dagestan." The Chechens expected to be welcomed as Muslim brothers. They expected to be received as courageous fighters come to free Dagestan from its evil government and Russian oppression. This was not the case. Rather, the Dagestanis perceived this act as terribly aggressive and horribly ungrateful. Many Chechens had received refuge from Dagestani families during the First Chechen War [20]. Military operations in the winter of 1999/2000 led to, "The liquidation of a considerable number of Chechen military and political leaders in Grozny ..." [21]. On 16 April 2009 Russian President Medvedev issued a decree suspending Russian operations in Chechnya. The current Chechen President Ramzan Kadyrov claimed victory and remarked that the "bandits have been defeated" [22].

b) Chechnya after the wars

Chechnya has been decimated by years of war. Russia characterized the First Chechen War as an effort to restore order in a hostile republic. The Second Chechen War was characterized as an anti-terrorist action. Russian political leadership viewed this as the beginnings of a global war against Islamists. They supported this claim with evidence of Islamist receiving support from Middle Eastern countries and international non-profits [23].

Fierce fighting and the indiscriminate targeting of civil infrastructure left the Chechen economy in shambles. Nicholas Griffin illustrates this point noting that kidnapping has become the most lucrative business in the country [24], fighting is seen as an honorable reasonable occupation [25]. A French reporter stated of his journey to Grozny in April 2000; "I didn't find a single building intact" [26]. Authors Emil Souleimanov and Stasys Knezys report similar findings, but they add disturbing details:

- 15% of the Republic's cultivatable soil is heavily mined
- 70% of the housing stock has been destroyed
- unemployment ranges between 80% and 100% based on age
- Drug trafficking and crime have become major aspects of the Chechen economy
- 80% of the country's factories are in ruin [27]
- the conflict cost Russia approximately 200 billion dollars or 2 trillion rubles, the operating budget of the Russian military for a year and a half [28]

After the Second Chechen War Chechnya became notorious for the October 2002 attack on the Dubrovaka Theater in Moscow and the attack on Beslan School Number One in September 2004. These attacks were organized by Shamil Basayev a hero of Chechnya, the Muslim Peoples of the Mountains, and a former top political official (First Deputy Prime Minister).

Basayev is named for the third Imam of Chechnya and Dagestan, and members of his wahhabist, Chechen separatist organization took over one-thousand hostages in

Beslan School Number One (Northern Ossetia). This incident did not endear North Ossetians with either the Sunni Muslim Republic of Chechnya or the district of Ingushetia. Some Russians believe that while the attack might have been politically motivated the target was chosen based on religion and ethnicity. The Beslan attack was conducted by wahhabist, Sunni Muslims from Chechnya, planned and organized in Ingushetia against the residents of predominantly Eastern Orthodox Christian North Ossetia.

c) Why Chechnya?

Like Pakistan today, Chechnya in 1994 attempted a political reconciliation with Islamists. President Yandarbiyev (second President of the Chechen Republic of Ichkeria) agreed to the establishment of Shari'a law as well as the formation of special units to enforce Shari'a law on-sight. President Maskdov (third President of Chechen Republic of Ichkeria) followed this course when he became President in 1996. In 1998 he re-affirms this policy [29]. Militant, radicalized Chechens turned towards whabbism during this time period. A schism grew between the government and the soldiers that had fought to establish the government.

There were numerous schisms between the Chechen separatists, the Chechen government, and the Russian Federation. The first President of the Chechen Republic of Ichkeria, President Dudayev began the secessionist movement in 1991. Dudayev was assassinated in Grozny in 1996, just prior to the end of the First Chechen War. That same year his First Deputy Prime Minister, Aslan Maskhadov negotiated the cease-fire terms and the end of the First Chechen War. Dudayev's immediate successor was

President Yandaribiyev. From 1996 until 1999 Chechnya existed as a semi-autonomous state of the Russian Federation. In 1997 Maskadov returned to politics, becoming the third President of the Chechen Republic of Ichkeria. Chechnya was scheduled to hold a referendum on their political status in 2001. But, the Second Chechen War began in 1999. The author could find no evidence that this second attack was sanctioned by Maskhadov or Yandarbiyev. In fact the opposite appears to be more likely. It has been reported that Baseyev was in communication with Russian intelligence officials prior to the beginning of the Second Chechen War. More discussion on this will follow later.

In 2001 Stanislaw Ilyasov became the Chairman of the Government of Chechnya. Later in 2001, Akhmad Kadyrov became the first president of Chechnya sanctioned (installed) by the Russian government. Both of these positions are supreme executive positions that are filled by Russian Presidential decree. Meanwhile, Aslan Maskhadov continued as the president of the Chechen Republic of Ichkeria until his death in 2005. In 2004 Yandarbiyev (second President of the Chechen Republic of Ichkeria), no longer in office, was assassinated in Doha, Qatar by Russian security personnel. Later that year, Akhmad Kadryov (President of Chechnya) was assassinated by Chechen separatists. Alu Alkhanov replaced Akhmad Kadyrov.

In 2005 Maskhadov was killed in Grozny. Russian officials announce that he was killed by Russian Special Forces during a raid in the rural area surrounding Grozny. There is speculation that separatists under the control of Ramzan Kadyrov participated in this operation. Ramzan Kadyrov was the First Deputy Prime Minister of the Chechen Republic, serving within the government of Alu Alkhanov the successor to his father

(Akhmad Kadyrov). In 2007 Ramzan Kadryov became President of the Chechen Republic with the expressed consent of Russian President Vladimir Putin.[7]

In the words of Dmitri Kozak, the Russian Special Presidential Envoy to the (Chechen) Region, the region is threatened by "permanent destabilization." He warns that continual conflict could lead to the unraveling of federal authority within southern Russia [30]. The entire Caucasus region has suffered from the conflicts in Chechnya. Violence continues to originate in Chechnya and propagate through the Caucasus. Other states in the Northern Caucasus are being pulled into conflict by Islamist terrorists; while rarely mentioned bombings and armed assaults still occur in the Northern Caucasus.

As mentioned in the previous section the Chechen economy is in ruin. Chechnya circa 2006 is not unlike Afghanistan circa 1996. Economic ruin and Islamic radicalization seem to lead Chechnya towards a hard-line, anti-Russian, Islamist regime. Foreshadowing the current situation in a public statement, the first President of the Chechen Republic of Ichkeria, Dudayev expressed the preference that Chechnya should become an "institutional secular state." He concluded his remarks saying, "...if religion takes priority over an institutional secular system, a more striking form of the Spanish inquisition and Islamic fundamentalism will emerge." [31]

Conflict has been a constant in Chechnya for a long time. Some of the conflict is related to Chechen culture and clan feuds. Just as likely, much is the result of Russian policy towards the area. Prior to the break-up of the USSR Chechnya may have been as much as 20% Russian by ethnicity. Under Stalin the ethno-geography was likely even more Russian. Stalin's policy of forced migration had ethnic groups moving all over the

[7] Ramzan Kadyrov is the son of Akhmad Kadyrov, the First President of Chechnya.

Caucasus and south Russia. Many ethnic Chechens resettled in Chechnya after the fall of the USSR. The immigration and "repatriation" of cultural Chechens coupled with the hatred and violence of the First Chechen War led to migration of ethnic Slavs and Russians from Chechnya, increasing the Muslim concentration in Chechnya.

Since the beginning of the Chechen Wars Chechnya was considered a haven for Islamists. While Dudayev hoped for a secular Chechnya, he accepted the aid of Islamists during the First Chechen War. The second (Yandarbiyev) and third (Maskhadov) Presidents of the Chechen Republic of Ichkeria attempted political reconciliation with the Isalmists by enacting Shari'a law. But this tactic did not seem to work, even after three proclamations exclaiming the supremacy of Shari'a law. As mentioned all three of these individuals were killed by Russian Special Operations forces or Russian Special Security Forces.

The current President Ramzan Kadyrov received the support of President Putin upon his ascendance to the position of President. This limits his exposure to Russian security forces. His political enemies in Russia are apparently placated. Meanwhile seven of his political rivals in Chechnya have been killed [32]. His power extends beyond constitutional authority or that provided by his office. Specifically, he still commands a sizeable personal Army (the Kadyrovtsy).

It is difficult to tell if President Kadyrov's ascension is a "good thing." He and his father (the First President of the Chechen Republic) both fought with Dudayev and Maskhadov during the First Chechen War [33]. On one hand, he attained this position with the tacit approval of President Putin. On the other, he has called the Russians

"bandits" [34]. President Kadyrov seems to believe that he is in a position of power. It would appear as though his political power and personal Army assure his existence within Chechnya. Two quotes that seem representative are: "I was always with the people. I don't know who changed which side, but I was always with the people." [35] and; 2) "I've already killed who I should have killed. . . . I will be killing as long as I live."[36] These quotes are provided because the author contends that they illustrate the brutality of the current president; he seems to have a high tolerance for what others would consider unseemly. To the point, the questions most relevant to this thesis are: 1) is there a historical relationship between Isalmists and the Chechen government and; 2) would President Kadyrov allow the establishment of an Islamists safe-haven to proceed in Chechnya?

There is a long history of dubious people interacting in and around Chechnya. Yandarbiyev (second President of the Chechen Republic of Ichkeria) was central in initiating the relationship between Chechnya and al-Qaeda. He was a leading fundraiser for al-Qaeda. In 2004 Yandarbiyev was killed in Qatar by two undercover GRU officers [37]. There are rumors placing Osama bin Laden and Mullah Omar in Chechnya after the fall of the Taliban in late 2001 or early 2002 [38]. It is uncertain if President Kadyrov would allow such visits to occur in the future. Because it is unlikely that Kadyrov would support the establishment of an Islamist safe-haven, he is liked by many Chechens. He is seen as an agent of change. It does not appear that he would gain anything domestically for taking such a risk.

On the other hand, Baseyev was a hero to the Chechens. He was linked to the Azerbaijan - Armenian War and the Georgian – Abkhazia conflict of 1992. During this time it is alleged that he received support from the foreign military directorate of the Armed Forces of Russia (GRU) [39]. So, at this point he had the support of Chechens and Russia. Later, Baseyev entered into relations with the Taliban in Afghanistan before he gained international notoriety during the First and Second Chechen Wars. Recall that Baseyev resigned from public office (as Vice-Prime minister) in 1998. Later, in 1999 he declared Aslan Maskadov (third President of the Chechen Republic of Ichkeria) an illegitimate leader. Baseyev was the operational commander for the terrorist attacks in Beslan and the Dubrovka Theater in Russia. Emir Kattab was awarded the Order of Honor and the Brave Knight Medal by Zelimkhan Yandarbiyev (the second President of the Chechen Republic of Ichkeria) during his acquaintance with Baseyev. Both men are rumored to have been linked to Osama bin Laden. And, both made trips to Afghanistan numerous times between 1991 and 1994 [40]. In fact the Taliban and Chechen rebels seemed to enjoy good relations.

"Yandarbiev, who briefly succeeded Dudayev as President after his death in 1996, was central in initiating the relationship with al-Qaeda and got the Taliban to recognize Chechnya's independence. Leading militants like Basayev, Khattab and Walid have all trained in al-Qaeda camps in Afghanistan or Pakistan along with several hundred other Chechens. According to Rohan Gunartna, an expert on al-Qaeda, Baseav and Khattab and Walid have all had close relations with Osama bin Laden, and they have, in turn, set up terrorist camps in Chechnya ... and Gunaratna has found that the intelligence agencies of Saudi Arabia, Lebanon and Iran 'directly and indirectly supported the Chechen guerillas'." [41]

Kadyrov's political power likely rests in part on his ability to keep money flowing in from Russia. Russia agreed to fund the rebuilding of Chechnya. However, President

Kadyrov has a powerful advantage over any would-be competitors. Namely, by his own admission, he has killed his political rivals. He seems to have Russia's support and, he has the Kadyrovtsy. The Kadyrovtsy are a semi-Constitutional force that answers to President Kadyrov. They were created following the death of Ramzan's father Akhmad (the first President of the Chechen Republic). They consist of militia originally organized by the Kadyrov clan augmented with Russian Special Operations forces. The Kadyrovtsy may have participated in the killing of Aslan Maskhadov. Their effectiveness may have provided the impetus for the redeployment of Russian forces from Chechnya. All of this being said none of these provide certainty for Kadyrov.

Aslan Maskhadov and Shamil Baseyev both enjoyed popular support. For a time they both had political power within Chechnay. All three men (Aslan Maskhadov, Shamil Baseyev, and Ramzan Kadyrov) held the equivalent title of First Deputy Prime Minister. All three fought the Russians. All three fought for the Soviet Army.[8] Chance and political guile favored Kadyrov and his father to this point. They became the Russian sanctioned separatists. They could use populist appeal against Russian forces while using Russian aid against other separatist organizations. Russia picked and supported an already well established Chechen clan as their proxy. Their proxy won. Fates turn quickly in the Caucasus. Likewise the political undercurrents that determine the state of affairs in Russia may not always be apparent.

In his article for *The Independent* Patrick Cockburn, drawing from an article written by Boris Kagarlitsky, claims that Shamil Baseyev and a senior "Kremlin leader"

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[8] The First President of the Chechen Republic of Ichkeria, Dzhokhar Dudayev was a Major General in the Soviet Air Force. Aslan Maskhadov was a Colonel in the Soviet Army. Shamil spent a brief time in the Soviet Army but is rumored to have ties to the GRU.

pre-arranged the attack on Dagestan and thus the Second Chechen War [42]. Mr. Cockburn provides political motivation as the catalyst for the event; a small war would be beneficial for Shamil Basayev, Boris Yeltisn and the Russian government at large. Cockburn's most telling and relevant point regards the then soon-to-be newly elected Prime Minister Vladimir Putin, "... that gave Mr. Putin the backing he needed to invade Chechnya. An unknown figure when appointed, with just 2 [percent] support in the polls, he was soon the leading candidate to win the presidency."[43] This claim is also supported by Sergie Stepashin, a former Russian Interior Minister and Prime Minister [44]. When the Second Chechen War began Vladimir Putin was the head of the Russian Federal Security Service (FSB) and Sergie Stepashin was the Interior Minister. Both men were appointed by Boris Yeltsin. If Mr. Stepashin's allegation is accurate then Vladimir Putin would have known of the Basayev plan to attack Dagestan. All Russian intelligence services, including the GRU, work for the FSB. Additionally, Russian Special Operation forces work for the GRU. Recall that Russian Special Operations forces are included in the Kadyrovtsy. It is not then unreasonable to assume then that the Kremlin has some influence over the Kadyrovtsy. Kremlin policy changes or a sufficiently organized local resistance is still a threat to the Kadyrov government. More specific to this research is that either event could precipitate the elimination of the current government and/or the creation of an Islamist safe-haven in Chechnya.

As discussed above, the lives and political careers of four men have been consumed to create the political career of a fifth. The Second Chechen War began almost a year to the day after the Ruble Crisis of 17 August 1998. Conceivably events such as

these could happen to Ramzan Kadyrov as well. The global economy is in distress. Russia's is worse than most. Estimates call for 45% decline in Russian exports and a subsequent 5% slump in Russia's GDP [45]. Islam is on the rise in traditionally Slavic Russia [46]. All the while, the ethnic Russian population continues to decrease demographically. A conflict against radical Islamists in Chechnya could slow economic decline in Russia and rally public sentiment behind the government. It could also slow the progression of Islam in Russia. Ramzan has been in power less than two years. With the exception of his father, most of the other men lasted about five years. A conflict in Chechnya could be beneficial for Russia; and President Kadyrov is still vulnerable. A Russian engineered Islamist insurrection in Chechnya could anneal Russian domestic support, purportedly as the Second Chechen War did. These events describe another incident that puts into motion the events that conclude with the establishment of an Islamist safe-haven in Chechnya. These facts lend themselves to the proffered scenario modeled in this thesis and discussed in Chapter Three.

In the context of this thesis, the US could view the appearance of a safe-haven in Chechnya as a security threat. As indicated above there are plausible reasons why Russia might support the establishment of a safe-haven in Chechnya or be unwilling to act against said safe-haven. Russian promises to deal with the perceived threat could be deemed unreliable by US policy makers. Thus, US action could be viewed as a necessity.

Concluding, Chechnya and Afghanistan have been intertwined for the last ten years, arguably for the last twenty. In May of 2000 President Putin threatened "preventive strikes" on Afghanistan as the result of a meeting between Aslan Maskhadov

and Osama bin Laden near Mazar-i-Sharif. In the deal between the two men Chechnya would receive material and technical assistance from al-Qaeda. It is ironic to note that the contrarian US position argued that President Putin would risk Western investment in Russia if he attacked Afghanistan over perceived Chechen – Afghan (Taliban) collusion [47]. Finally, the author suggests two reasons why Islamists would relocate to Chechnya: 1) pressure against traditional Islamist safe-havens in the Arabian Peninsula and Central Asia, along with historic ties between al-Qaeda, the Taliban and Chechen Islamic militants; 2) a political maneuver to create support for Slavic governance in Russia at the expense of the Chechens and Russian Muslims.

3. US – RUSSIAN POLICY PREFERENCES

The information contained in this section, in part, provides a qualitative assessment of US and Russian preferences. These preferences will be used to develop the quantitative model in Chapter Three.

a) Russia

Economic considerations

Richard Haass contends that Russia's future is uncertain, the result of a shrinking population base and a small GDP to landmass ratio. Russia is substantially larger than the US, with a GDP of Brazil [48]. Nikolas Gvosdev argues that this is "an illusion," or at least holds little merit [49]. Highlighting this academic disagreement is meant to illustrate Russian national challenges. Russia has been twice spurned by Azerbaijani hydrocarbon pipeline deals. The BCT pipeline and the BTE pipeline (Figure 3) were both built to provide oil and natural gas to European markets. Both pipelines bypass

Russian territory even thought transiting through Russia would be a shorter. The reserves of the Caspian basin could be the third leg in the stool [50]. Thus, as nations look to hedge their positions regarding oil imports and exports, the Caucasus nations become a point of interest.

Russia maintains sufficient power in the region to block Western goals locally while dramatically raising the cost of any global policy resulting from a regional grievance. Russia's power is not limited to military *compellence.* In this thesis *compellence* is defined as the credible threat of the use-of-force to resolve a conflict between two nations. Seventy-five percent of the GDP of post-Soviet states comes from or involves Russia [51]. Additionally, as Russia secured its economic independence from the West, thanks in part to oil prices, they began to enter into regional/Eastern European negotiations with additional clout. Namely, they had money and a fairly set of trading partners.

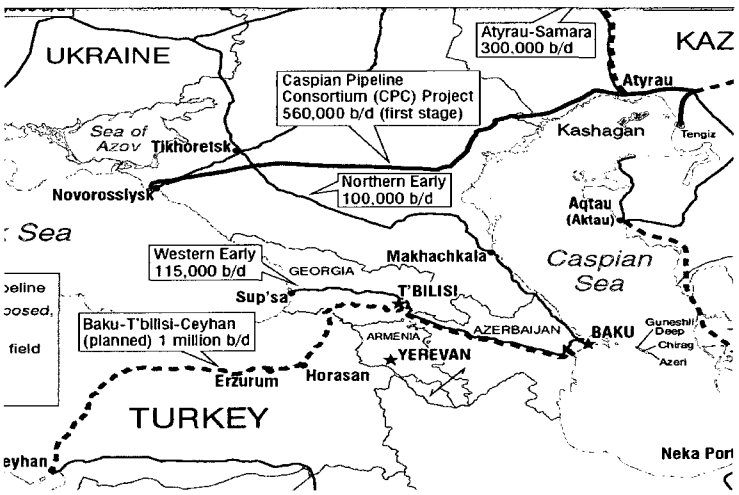

Figure 3. Map 3 : The BTE and BTC pipelines
Source: Perry-Castenada Map Collection, The University of Texas, Originally product of the United States of America Central Intelligence Agency, 2002

Despite the angst associated with regional pipelines, Russia and the US should be able to come to an agreement on global issues. Such issues include nuclear weapons non-proliferation and Islamic extremism. Similarly, compromise on, or the conduct of, joint action into the Russian sphere of influence (SOI) should not be precluded. Instability in the Caucasus is only acceptable to Russia as long as it is limited and contained. A strong Russia shepherding weak Caucasus states is a preferred Russian policy. A corollary to that policy is that the West should have limited, if any, involvement in the Caucasus.

Social considerations - security in the Caucasus and Southern Russia

Russian policy in the region has been to consolidate power north of the Caucasus Mountains in order to provide security in Southern Russia. Terrorism, Islamic extremism, and the trafficking of illegal drugs are all concerns of Russia. This national policy was first expressed by President Yeltsin in 1995, and it seems to resonate almost fifteen years later. Regarding the Caucuses, Russia's concern about its southern border goes back much further than 1995, at least two-hundred years prior. This concern is characterized as Russia's sense of *strategic distance*. The concept of strategic distance is a way of looking at national security based on geography. It states that events that occur closer to the center of Russia are of greater concern than those that are further away. Historically Russia's southern and western borders have been the initial fronts in Russian wars. Mindful of history these concerns endure. The red ellipse on Map 4 roughly locates Chechnya. This map illustrates how relatively close major Russian population and industrial centers are to its southern and western borders.

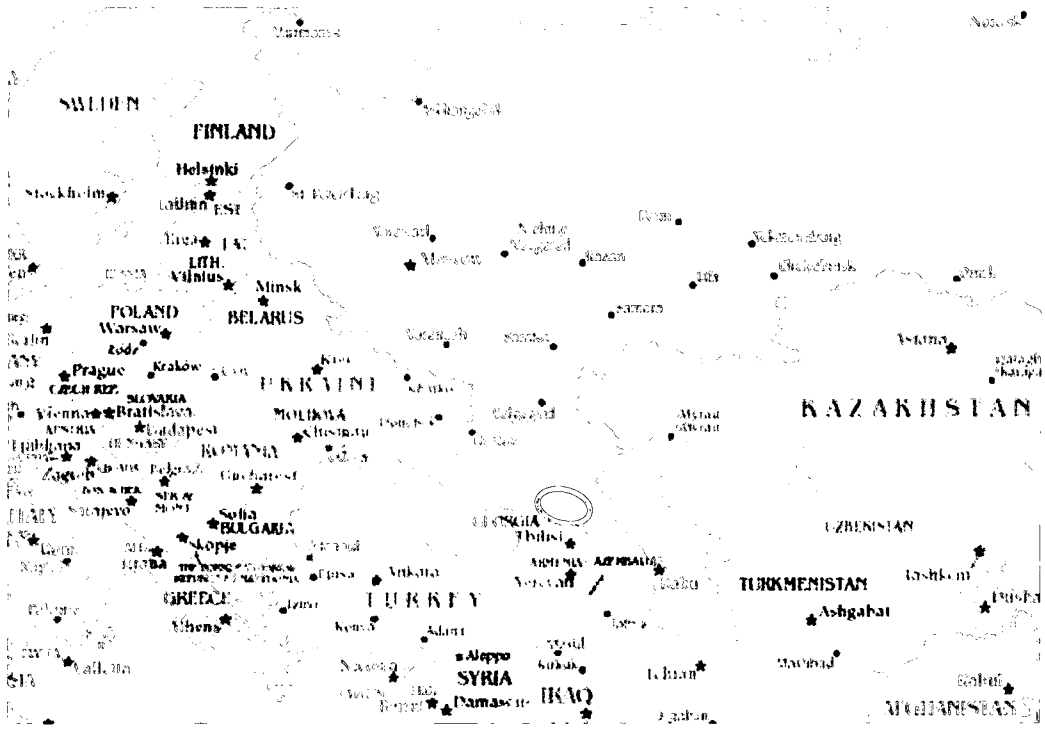

Figure 4. Map 4 : The Caucasus states
Source: European Dialogue

Policy in Europe and Asia

Increasingly political dividends in Russia are paid to those who pursue a policy of estrangement from the West and espouse entrenched self-interest through a unitary, global policy of 'What's good for Russia?' And, what's good for Russia is stability and predictability along its southern border. While Russia has fought vigorously to maintain control of the territory on the north side of the Caucasus it is unlikely that Russia would engineer significant unrest to its south [52].

Russia's role in regional conflicts may be over-sold particularly the notion that an invisible hand is quietly fomenting unrest and conflict in the region. R. Craig Nation recognizes that while Russia exerts meaningful control in the region, through "significant

policy levers," unrest and instability on Russia's southern border is not in its best interest [53]. But, it does provide a fairly unique opportunity for Russia to mold the region to fit its own self-interest. Western image and reach has diminished as a result of the wars in Afghanistan, Iraq, and perceived US policy hypocrisy. In regards to coalitions in general and US – Russian relations in specific the author contends two points: 1) regional alliances and security treaties based on local issues, common history, and shared ethnic origins are easier to establish and maintain than those that are not.[9] Simply put, perceived momentary common interest enjoys supremacy in the Caucasus; 2) there are rational reasons why Russia would oppose any and every US policy regarding the Caucasus states. Might Russian concerns of US involvement in the region be why Russia is not pursuing the conclusion of the US led wars in Iraq or Afghanistan, or the mending of US – Iranian relations? Progress on these fronts would mean that the US would be able to turn its attention to Russia [54].

Putin and Medvedev have spent considerable effort consolidating political power in Central Asia and attempting to subordinate post-Soviet states like Georgia because of their interests in the Caucasus and the Caspian [55]. Energy reserves and pipelines play an important role in regional economic affairs. The oil and gas that flows from this pipeline to the West almost assures the independence and Western goodwill towards the states which it runs through. Given this, Russian policy has been to systematically increase their control over oil and gas transportation through the Caspian Region [56].

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[9] Consider that Chechens joined Russian soldiers during the Russia – Georgia war, and the unusual U.S. Armenia relations. In an area dense with history, relations are cemented on historical events.

This requires Russia to hold influence of regional governments. There are ethnic and social considerations involved as well.

In Russia twenty-five percent of the population is not ethnically Russian. It includes about thirty million Muslims. As mentioned, Islam has an emergent role in Russia, threatening to replace the existing Slavic order in portions of the country. A policy authorizing the use of force against Muslims in a former Soviet state could be met with significant condemnation be a meaningful portion of the population.

When determining long-term foreign policy Russia likely realizes that within twenty years there will be huge regional changes. China, Russia's geopolitical rival, may reach its peak power [57]. And, the population of the region will be very different than it is now. More Muslims will live in traditional Slavic regions of central Russia and a larger number of Sino-Russo citizens along the Russian – China border. All of this is capped off with the remembrance of past grievances that will influence current and future Russian foreign policy.

There is a common belief that the US exploited Russian weakness following the break-up of the Soviet Union. While the US was initially very careful not to gloat over a perceived Cold War victory, policies towards Russia were not gracious. Russia was willing to do whatever was needed to be done in order to maintain support from the US. Beginning with Gorbachev, Russians have very strong feelings about Gorbachev. He was not liked. He received about one-percent of the popular vote following the breakup of the Soviet Union [58]. Next came Boris Yeltsin. In the eyes of many Russians Boris Yeltsin was a drunken-fool that sold Russian honor, pride and independence for limited

personal and national gains [59]. Concessions made by Yeltsin were followed by more demands and increasingly aggressive US foreign policy. Putin is seen as a restoration president. He has made it known that Russia believes that contemporary US policy seeks to diminish Russian political influence [60]. Brent Scowcroft sums up Russia as:

> "*The Russian soul is an amalgam of these experiences. Along with their very many assets, they can be overly aggressive when they're strong, and they brutalize other people. And, sometimes fawning when they're weak.*" [61]

b) United States

National Security Concerns Regarding Militant Islam

The dual requirements to secure energy resources and combat Islamic fundamentalism are two defining national security concerns for the US. The attacks of September 11, 2001 and the increasing global demand for oil place political constraints on US strategic decision-making. These two constraints are simultaneously national concerns and issues for domestic consideration.

The author contends that the US perceives an increasingly militant, Muslim world. There is unrest in Pakistan and Afghanistan. Success in Iraq is uncertain as is any meaningful progress in the Iranian nuclear arms stand-off. These concerns pale in comparison to the restrained anarchy that exists in African nations such as Somalia, Sudan, and Congo. Security problems abound; and, military force can be a seen as reasonable way to preclude future attacks on American soil while securing regional and national interests.

Regional Interests

The eight years of US President George H.W. Bush witnessed periods of cooperation and generally improving relations between the US and former Soviet States in both Central Asia and Eastern Europe. With the inclusion of Poland, Romania, and the Czech Republic, NATO has reached the border of the Russian Federation. Other former Soviet states such as Kazakhstan, Ukraine, Georgia and Azerbaijan have signaled their intention to deepen their involvement in NATO through the Individual Partnership Action Plan (IPAP). More recently, the actions of Vice-President Joe Biden between April 2009 and October 2009 indicate that these states are seen as the "New Europe" and the "New NATO." Specifically, his activities in the area focused on increasing their participation in the Afghan War, as well as their acceptance and assistance in a new European ballistic missile defense (BMD) shield. His statements in Ukraine explicitly refuted Russian hegemony in Eastern Europe and to a lesser extent Central Asia [62].

While the US attempts to counter Russian policies and maximize their national benefits, Russia does the same. US involvement in the Caucasus could bring increased stability in the region. Similarly, US investment in the region could help diversify monolithic economies. But, while stability is good for Russia, a decrease in regional power is viewed as a disadvantage. Negotiated joint action could limit expenses for both states but it would also limit any political or economic gains for either nation. The establishment of an Islamist safe-haven in Chechnya presents a problem for both nations. Both nations' security is threatened by the existence of the safe-haven thus, military action to remove the threat could be appealing. However, the US and Russia have to consider the decisions of the other. For Russia, would the US accept Russian assurances

that the threat would be dealt with appropriately? Would the US attempt to re-make the region once they had invested American blood and treasure in a Chechen conflict? For the US, could Russia blunt US power by allowing the existence of a safe-haven in Chechnya? A negotiated US – Russian policy of joint action could be a diplomatic and foreign policy success. But, it could also become a practical failure. These decisions can be modeled and analyzed using Game Theory.

4. THE QUANTITATIVE METHODOLOGY: INTRODUCTION TO GAME THEORY

a) Game Theory

Game Theory was developed by John Von Neumann and Oskar Morgenstern in 1944. The resulting publication was *Theory of Games and Economic Behavior*. Game Theory uses probability theory and other forms of applied mathematics to determine reasonable decision solutions. Game Theory has long been used by economists to model buyer – seller completion in mirco-economics. An important concept in Game Theory is the requirement that two (or more) individuals or coalition groups are in competition for some 'thing', generally referred to as the payoff. Payoffs can be tangible or intangible.

Essentials of Game Theory

For the purposes of this thesis the author defines the essentials of Game Theory as relating to the following:

(1) Payoff/Preference

(2) Strategy

(3) Node

(4) Equilibrium/Solution

(5) Player

In Game Theory two players, or two coalition groups, vie for control of some finite asset. In political games two politicians compete for votes or campaign financing. In economic games two corporations compete for market share or consumer loyalty. Players expect to receive a payoff based on the combination of their decisions and the decisions of their competitor. All players have a preference. A player's preference assigns rank-order to the outcomes of the game. When payoffs are quantifiable and in familiar units, then assigning preference is not difficult, rational players prefer $100 to $10. Tangible payoffs are often quantified in utils. However, when the payoff is intangible, or when payoffs have a value based on the specific beliefs of the players, then it is more difficult to compute payoffs. In this instance preference is used to determine a choice.

Consider a game composed of two players, defined as [***A***, ***B***], competing over draws from a box of donuts. The box of donuts is a set ***D*** = [glazed, chocolate, blueberry, maple-frosted]. Preferences are ordered (***A***, ***B***) ∋1 > 2 > 3 > 4. Each player's preference is a functional mapping that attaches their individual preference to a specific donut.

f_A = [(1, chocolate), (2, blueberry), (3, maple-frosted), (4, glazed)]

f_B = [(1, chocolate), (2, maple-frosted), (3, blueberry), (4, glazed)]

The utils are the integer value associated with the mapping. Player ***A*** prefers chocolate over all others (1). Glazed donuts are the least preferred (4). In this specific case the payoff utils are equivalently spaced integer values, where smaller is better. This is not a requirement, and is actually a simplification of Game Theory.

A game can be expressed in two ways. The traditional version is referred to as the normal form. The normal form is a tabulated expression of choices and payoffs. The other form is the extensive or strategic form. This form lends itself to decision analysis as it views any decision as the result of previous decisions. This sequence of decisions produces a game tree. Extensive form games are inherently sequential games. Normal form games are simultaneous and exist to predict, or explain, a single decision. Extensive form games use branches and nodes to describe movement within the decision space. As mentioned this is referred to as the game tree.

A node denotes a decision and branches transition the players between nodes. Conceptually nodes are decision points. Branches equate to time and consideration prior to the next decision; they move players between nodes (decision points). A central theory in Game Theory is the existence of equilibrium points.

Equilibrium points, commonly Nash Equilibrium points, are the pair of decision that provides the best payoff to each player such that they could not do better by themselves. And, since players are assumed rational they will make the choice that suits them best, then a Nash Equilibrium is the *solution to the game.* Mathematician John Nash proved mathematically that there is a solution for every game.[10] An advantage of Game Theory is that it examines the interaction of two decision-makers that understand that their payoff is linked to the decision made by their competitor. Thus, solutions to games can be less than optimal while still being an equilibrium point. In this instance the conflicting choices limits payoff to both players.

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[10] Nash allows the use of mixed strategies, decision by dice, as well as pure preferential strategies.

Sequential versus simultaneous games

This thesis uses an extensive form, sequential game referred to as the International Interaction game. The thesis will also borrow concepts from other games [63]. As such other forms will be described succinctly.

A sequential game is simply a series of games played by the same group of players. A sequential game can describe the marketing and strategic business management practices of Coca-Cola and Pepsi. In sequential games new information is brought into each subsequent game. These games allow for learning, cooperation, communication, under-table deals and coercion [64]. A simultaneous game is a game in which both players choose a course of action simultaneously.

A game can be repeated but it is either simultaneous or it is sequential. In simultaneous games players choose a course of action at the same time and there is no priori. In sequential games there is a priori, knowledge of events before the required decision. In sequential games the game is started by a move-by Nature, a chance event. This move then precipitates the move of one of the players, say player ***A***. Player ***B*** then reacts to player ***A***. The decisions cascade down the extensive form game, the game tree, until they reach the end-game and payoff. Sequential games can be either zero-sum or non-zero-sum games.

Zero-sum and Non-zero-sum games

In a zero-sum game the winner takes all. One player gains while the other loses. In a non-zero sum game while there is a relationship between payoff and success, that relationship is not binary. In fact, in a non-zero sum game both players can lose. Non-

zero sum games are generally more complicated and include more rules, such as the allowance for communication, agreements, order of play and information.

Communication

Communication allows informed decision-making. Communication is not always beneficial. Communication can be used to coerce, limit decisions, or provide deceptive information. Communication is involved in learning. In a repeated or sequential game communication between the players can add context to the data being presented.

Agreements and side payments

Agreements and side payments are important because they directly influence payoff values and decision logic. Side payments act to reinforce the payoff. A payoff of x might be reinforced by a side payment of y. In this example an individual's payoff may be of such value that he is willing to compensate his competitor, who realizes that he has more to gain from cooperation than conflict.

Agreements limit decisions. Agreements can also reduce payoff. Reneging on a contractual agreement might provide increased capability. But, that capability is constrained by losses associated with the breach of contract. Consider the value of the solution space to be $2X$. Two players $[A,B]$ split the space equally such that their payoffs are: $A = X$ and $B = X$. The division of the solution was negotiated so that each player receives half of the solution. A superior organization has the ability to punish the players from deviation. If A violates the contract he might receive $X+Y$, his original payoff plus a fractional amount to B's. But, he will also be punished (by amount = Z). So, as long $Z > Y$ it is unwise to break the negotiated settlement. This is a simplistic example, but it is

one that illustrates why political figures and nation states are rarely able to get what they want through consensus. The individual, or state, is in the middle of competing interests. A modern political version of this dilemma is the Watergate scandal, and the court case *United States* v. *Nixon* [65]. In this instance the break-in and wire-taps are the "agreement" – or the breaking there of. The decision to release the White House Tapes is a subsequent game, as shown in *The Presidential Election Game*, and is predicated by the initial action.

Order of play

Most games begin with a move by Nature, a chance event that initiates the game. Order of play becomes important when games are not simultaneous.

The first move is beneficial in a single-play game. The player with the first move can make certain he attains the value of the game, and in effect, force the hand of the second player. In repeated or sequential games the player with the first move reveals his strategy. The initial move can indicate a player's level of risk tolerance. Additionally, while the first move favors aggressive behavior the second move encourages punishment. An aggressive player can be punished by the other at the second move.

The Theory of Moves by Brams differs from traditional Game Theory in that players are expected to update their preferences while the game is being played. This general concept will be included in the thesis model. Specifically, a game is viewed as a series of interactions that occur in a sequential order. Players calculate their payoff by summing the immediate and longer-term value associated with their decisions. This technique lends itself to the extensive form and to the International Interaction Game.

Information

Information can be bane or boon. Information about another player's preference can make the other player susceptible to limiting strategies, threats [66] and complications associated with escalation, compellence and deterrence [67]. A deluge of information can diminish certainty. The converse is also true, sequestered decision-makers can be steered towards a decision based on the information they are provided, or the information that is blocked.

b) Contemporary Game Theory

There is an abundance of literary material on Game Theory, and its application in the study of international relations. Three contributions important to this research are cited below. These concepts will be included in the thesis model.

Domestic considerations – factors in international policy

In this category the foremost concept is - domestic considerations play a role in international policy decisions. Politicians are constrained by their constituents. This is a reasonable statement for all but the most dictatorial regimes. Domestic policy influences foreign policy-making, the strict Realpolitik theory does not do an adequate job predicting future conflict, or explaining historical conflagrations [68]. Nations are composed of people from various ethnic and cultural origins. The norms, values and beliefs of a culture affect how that culture weights preferences, communicates and cooperates [69]. These small, individual biases are tiny perturbations that sum up to create a meaningful political force. *This is the driving force behind suspicion and the fear of exploitation.* Competing nations may believe that their opponent is willing to risk

conflict in order to pursue an advantage through exploitation during a negotiation. Thus, through fear of exploitation the dove is willing to bet on a chance outcome (armed conflict) over the sure exploitation (negotiation) of their aggressive competitor [70]. Domestic political support for an issue, its salience, is linked to national values and the perception of global realities. The politician's challenge then is to address the problem at-hand and through the crafting policies that are agreeable to the median voter. Median voter salience can be viewed by a distribution curve.

Feelings about a particular issue can be plotted as a distribution curve. Voter preference, or issue salience, is the dependent variable. The median position for a normal distribution of 100 samples is 50. The politician that aligns himself at the median position will receive 50% of the political payoff, while having an even chance at some remainder value [71]. Even in this simplified example, it is easy to see why political polling has become ubiquitous. Individual (voter) decisions are aggregated, manipulated and turned into new information to support national level decisions.

Use of force and considerations of national dominance

Capitulation has a known cost; it is a loss, there is no possibility of winning. *Acquiescence* is probabilistic. *Acquiescing* provides a probability for some gain. Negotiation and conflict have probabilistic costs. The *status quo* can be preferential middle-ground [72]. When the *status quo* is no longer preferred, *negotiation* is preferred over conflict. The key consideration in making a decision is - do the benefits outweigh the costs?

There are costs associated with military action; but success in a military endeavor can prove beneficial. Chance and uncertainty are hallmarks of war; a rough equation governing conflict can be written as: $P^i(War^{gain}) > (1-P^i)(War^{loss})$. This equation expresses that the product of the probability of success (P^i) for nation (***i***) and its associated gain (War^{gain}) must be greater than the product of the probability of failure ($1-P^i$) and the cost of failure (War^{loss}). A conflict for (***i***) is beneficial if the probable benefits out-weight the probable costs. Numerous factors combine to create the cost of conflict. Four factors are presented in *War and Reason*: α, τ, γ and ϕ.[11] All of these rules, in part, form the seven assumptions that are used to establish the International Interaction Game.

These assumptions are affected by reality. Assumption 4 from *War and Reason*, states that nations prefer to *negotiate* over initiating a war. There are costs and benefits associated with conflict. Combine these beliefs with the Assumption 6, and defining costs to the target (τ) > costs to the attacker (α), it is possible to imagine instances where war is preferable to either the *status quo* or *negotiation*. This is proven numerous times under various conditions in *War and Reason*; it is the Basic War Theorem [73].

Policy formulation and rational decisions

The thesis defines rational in the common vernacular, in a pragmatic way. As presented in the *European Community Decision-Making Model*, the thesis uses rational to mean a subjective expected utility maximizing [74]. There is a nuanced difference between this interpretation and that defined by Luce [75] and commonly used in Game

[11] α is the cost to the attacker for fighting away; τ is the cost the defender pays as the target of the attack. γ is the cost to the states that capitulates and ϕ is the domestic political cost of going to war. This is assumption number six, of the seven assumptions required in international interaction game.

Theory and Agent-Based modeling. The latter does not explicitly consider the actions of other actors, agents, or opponents. A rational decision is informed by subjective expected gains and perceived risk. Strategic decision-makers are rational actors.

That nations participate in conflicts is indication enough that decision-making is flawed. Human dimensions matter. Personalities, errors, bad choices and chance play a role in decision-making and the visible outcome of policy decisions [76]

The International Interaction Game

The International Interaction Game was developed by Bruce Bueno de Mesquita in *War and Reason*. It is a sequential, extensive form game in which two players, national leaders for competing nations, make a series of decisions to redress a mutual grievance. There are eight possible outcomes to the game and a single equilibrium point. Each subsequent decision allows leaders to escalate or de-escalate. Each leader has a preference list that describes their degree of satisfaction for each of the eight outcomes. The outcomes are a set of thirteen: *capitulation*, *acquiesce*, *status quo*, *negotiation* and, *war*. The leaders have a sense of history and their own beliefs about their competitors preferential ordering of the thirteen outcomes (Figure 5).

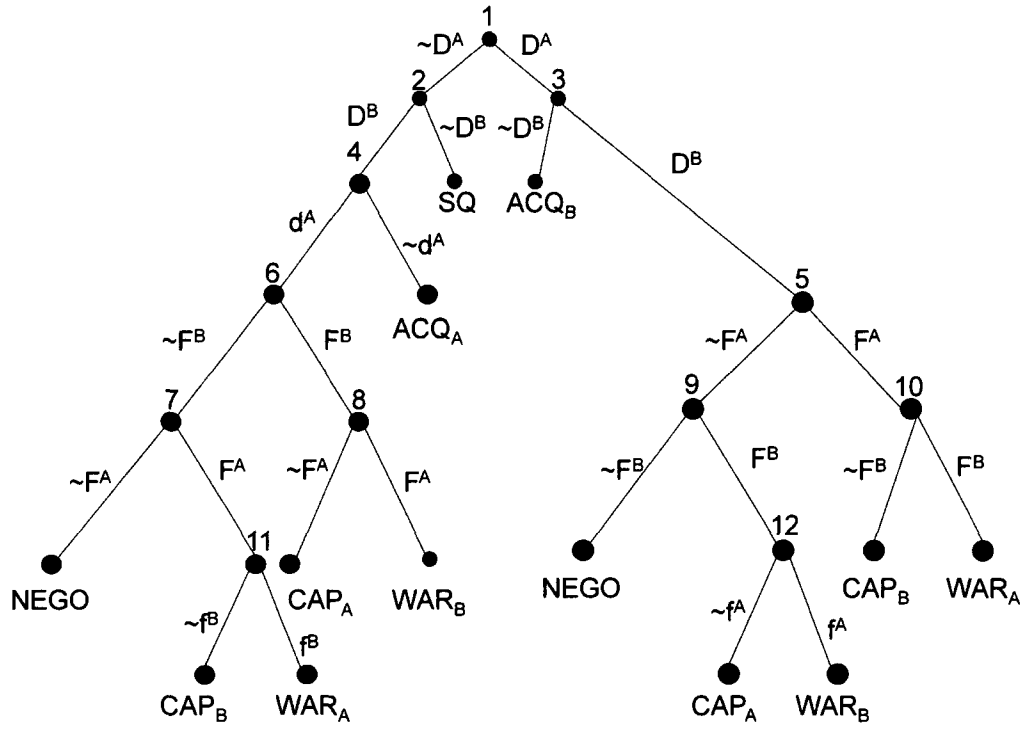

Figure 5. The International Interaction Game (1 of 2)
Source: *War and Reason.*

The first move belongs to player/leader ***A***. Player ***A*** can demand (D^A) or not-demand ($\sim D^A$). Assuming that player ***A*** makes a demand (D^A) of ***B*** advances the game to node 3. At node 3 player ***B*** can issue a counter-demand (D^B) or not-demand ($\sim D^B$), in which case the game ends with the acquiescence of player ***B*** to player ***A***. If player ***B*** issues a counter-demand the game advances to node 5 and player ***A*** can chose to use-force (F^A) or not-use-force ($\sim F^A$). Once the flow of the Game is understood it is important to: 1) clarify assumptions made regarding the International Interaction Game and; 2) define the various payoff terms and subsequently adapt the International Interaction Game for use in this thesis.

Seven assumptions govern the International Interaction Game. In general these assumptions constrain a leader's preference. Leaders prefer *negotiation* to *war*; and, their own *acquiescence* to *capitulation*. *Capitulation* has a known cost and results when a nation concedes to the demands of the other after being attacked. But, consider that a nation that capitulates loses 100% of the time; and, a capitulation reorders relations between the two nations. On the contrary *Acquiescence* has a probabilistic cost and results when a nation "gives-in without a fight"; they concede to the initial demand. But nations that acquiesce maintain the international order. They chose a course of action rather than being forced into one through military defeat.

Finally, leaders prefer the *acquiescence* of their competitor to a *negotiate*(d) settlement. Their competitor bends to their will without a counter-demand. These preferential orderings exist because *negotiation* and *acquiescence* result in probabilistic payoffs/costs and nations prefer to settle their grievances without armed conflict [77]. Five adaptations will be applied to this basic Game Theory model to develop the Thesis Game Tree model. The Thesis Game Tree model will be solved; later is will be extended and simulated, incorporation concepts from *War and Reason* and other attributed to the author.

In summary, this chapter has presented the case for the immigration of radical Islamists from the Arabian Peninsula to the Caucasus, specifically to Chechnya. It has also detailed US and Russian policy in the Caucasus region and some of their historical animosities. This description included examining the evolution of their respective national security strategies and policies regarding Islamists, in Central Asia, and the

Caucasus. Finally, this chapter discussed Game Theory in general and the International Interaction Game in specific.

Notes

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[4] Ibid, 130

[5] Kazantsev, A. "Russian Policy in Central Asia", p. 1074, *Europe-Asia Studies*, 60 (6, 2008): 1073-1088

[6] *America's Secret War: Inside the Hidden Worldwide Struggle Between America and its Enemies*, p. 12

[7] Knezys, S., and R. Sedickas. *The War in Chechnya*, p. 15, College Station: Texas A&M University Press, 1999

[8] *Russian Foreign Policy and the End of the Cold War*, p. 136

[9] "Russian Policy in Central Asia", 1074

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[11] Ibid, 1203

[12]Azrael, J .R., and E .A. Payin, *U.S. and Russian Policymaking with Respect to the Use of Force*, p. 13, the RAND Corporation: Arroyo Center, 1995.

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CHAPTER THREE:

DEVELOPING THE COMPUTATIONAL MODEL

This chapter of the thesis extends the qualitative research by providing a quantitative model to examine US and Russian policy decision-making. The quantitative model developed for this thesis, referred to as the Thesis Game Tree, is an extensive form Game Theory model. The Thesis Game Tree is based on the International Interaction Game created by Bueno de Mesquita in *War and Reason*. This thesis adapts the International Interaction Game in numerous ways. This chapter will describe the quantitative method from a procedural stand-point. And, it will define terms specific to the methodology. First, the term "outcome": an outcome is the conclusion of a conflict at which point the US and Russia receive a payoff. That being said the first step in model creation is to express US and Russian preferences as a range of values from ***a*** to ***b*** or ***[a, b]*** (inclusive), with ***a*** representing the lower bound and ***b*** representing the upper bound. This feature is unique to the Thesis Game Tree model. Strict ordinal preferences were used in *War and Reason*. This adaptation models a decision-maker's uncertainty regarding a payoff as it pertains to a specific decision. "Uncertainty" is defined as the inability to fix a value to a variable. In this instance, the US prefers certain outcomes over others; and, it establishes these preferences based on their subjective expected utility. However, the US cannot know the exact payoff of a policy. They can only be certain that the payoff value falls within a specified range, as mentioned ***[a, b]***. After model creation, a simulation will be engaged to present numerous instances of the model, specifically a Monte Carlo simulation. A random number will be generated and

subsequently mapped to its appropriate range as defined in this chapter. These values will then be applied to the Thesis Game Tree. Once applied, the Thesis Game Tree will be solved through backwards induction. The results of repeated independent simulations will be reported in Chapter 4. The following details a review of player preferences.

Recall that preferences are measured in a unit-less value referred to as a **util**. A player's ***preference*** is a subjective assessment of value. Preferences are used when quantifiable values cannot be assigned to an outcome, or when doing so would be inappropriate. This models uncertainty in decision-making. For instance, $10 has a greater value than $1. Given "$10 or $1" option the appropriate response is to choose $10. This action is referred to as *maximizing payoff.* However, if an unknown amount of money is stuffed into two envelopes, one large and the other small, the appropriate preferential response is to choose the larger envelope. The larger envelope can hold more money thus increasing the possibility of a larger payoff. A lottery has an uncertain value. An expected value can be determined. This is done for the Thesis Game Tree, later within the chapter.

Section 1. of this chapter examines the International Interaction Game and illuminates the researcher's adaptations to it. In section II., US and Russian payoff preferences are determined. The second section will conclude with a discussion on the assumptions required to implement the Game. The 7 - Assumptions are borrowed from *War and Reason*, but clarification regarding their use in this thesis is provided. The third section examines the preferences in detail by linking the quantitative preferences with information from the qualitative research. The natural outcome of this process is a

"what-if", a scenario that illustrates possible choices and their outcomes. With assumptions and preferences in-hand, a plausible solution to the "what-if" scenario is provided in Section 3. This plausible solution will be accompanied by an explanation as to why these decisions might occur. This explanation is informed by the literature and based on the structure of the model. Section 4. describes the creation of the simulation in more detail.

1. ADAPTATION OF THE INTERNATIONAL INTERATION GAME

The International Interaction Game models the decision-making that occurs between two leaders (individuals or possibly coalitions) during a conflict. Rational players (leaders) have ordered outcome preferences. Their preferences drive their decision-making. In the International Interaction Game policy decisions (branches) escalate the conflict to a shared end-state (node) at the conclusion of the game. Both the International Interaction Game, and adaptations to it, are discussed in the following section.

a) The International Interaction Game

The International Interaction Game was developed by Bruce Bueno de Mesquita in *War and Reason*. It is a sequential, extensive form game in which two players, national leaders for competing nations, make a series of decisions to redress a mutual grievance. There are thirteen possible outcomes to the game and at least one equilibrium point when using pure strategies. Each decision provides leaders (players) the ability to escalate or deescalate the conflict. Each leader has a preference list that describes his degree of satisfaction for each of the outcomes. The outcomes are a set of thirteen drawn

from the five choices: *capitulation*, *acquiesce*, *status quo*, *negotiation* and, *war*. The leaders have a sense of history and their own beliefs about their competitors preferential ordering of the thirteen outcomes (Figure 6).

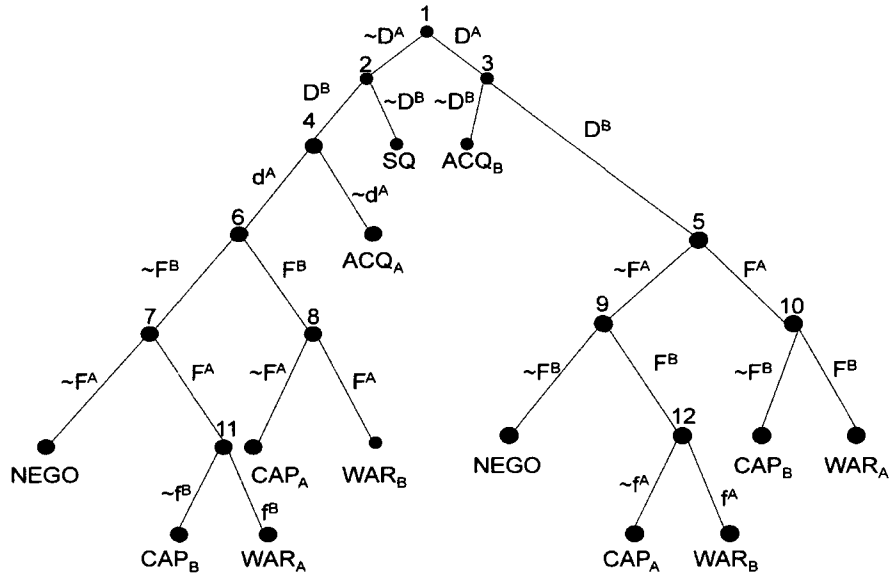

Figure 6. The International Interaction Game (2 of 2)
Source: *War and Reason.*

The first move belongs to player/leader ***A***. Player ***A*** can demand (D^A) or not-demand ($\sim D^A$). Assuming that player ***A*** makes a demand (D^A) of ***B***, this move advances the game to node 3. At node 3 player ***B*** can issue a counter-demand (D^B) or not-demand ($\sim D^B$), in which case the game ends with the acquiescence of player ***B*** to player ***A***. If player ***B*** issues a counter-demand the game advances to node 5 and player ***A*** can chose to use-force (F^A) or not-use-force ($\sim F^A$). Once the flow of the Game is understood it is important to: 1) clarify assumptions made regarding the International Interaction Game and; 2) define the various payoff terms and subsequently adapt the International Interaction Game for use in this thesis.

The 7 – Assumptions from the International Interaction Game govern this model. In general these assumptions constrain a leader's preference. Leaders prefer *negotiation* to *war*; and, their own *capitulation* to *acquiescence*. *Capitulation* has a known cost and results when a nation concedes to the demands of the other after being attacked. *Acquiescence* has a probabilistic cost and results when a nation "gives-in" without a fight; they concede to the initial demand. Finally, leaders prefer the *acquiescence* of their competitor to a *negotiate*(d) settlement. In this instance their competitor bends to their will without a counter-demand. These preferential orderings exist because *negotiation* and *acquiescence* result in probabilistic payoffs/costs and nations prefer to settle their grievances without armed conflict [1].

As mentioned in Chapter 2 *negotiation* is preferred to *war*. In the general form of the game a negotiated settlement exists as the *equilibrium point*. This is referred to as the *Cooperation Proposition 4-1* [2]. This occurs when both leaders prefer a *negotiation* to coercion; and, at least one leader prefers *negotiation* to the *status quo*. That being said, *war* can be an *equilibrium point* given certain additional constraints. This is established by the *Basic War Theorem (Domestic Proposition 3-1)* [3]. This can occur when a nation fears being exploited during a *negotiation*; and, it believes that its opponent prefers *war* to *acquiescence*. These beliefs re-order preferences, or change payoff values. One consideration is that the initiation of a war provides a first-strike advantage.[12] The first-

[12] History is replete with examples of nations attempting a decisive victory borne of the first-strike advantage. In both world wars Germany believed that a first strike would allow it to acquire land and sue for peace. Japan's attack on Pearl Harbor was "politics by other means", frustrated by use policy Japan attacked hoping to cripple US naval capability and change US policy. The Six Day War is an example of a preemptive first-strike. A popular example from ancient history is the Peloponnesian War wherein Sparta chose to declare war on Athens as opposed to being outflanked and with diminished influence.

strike advantage decreases the expected cost of the conflict because opening stages of the military campaign will likely not be waged on the initiators home soil. The following is an examination of the payoff terms and an introduction to the adapted International Interaction Game developed for the purposes of this thesis.

b) Payoff terms and initial adaptation of the International Interaction Game

As mentioned earlier, the outcomes are a set of thirteen, they are: *capitulation* and *acquiescence* by either side. There is the possibility of a *negotiation* and the maintenance of the *status quo*. The remaining outcomes are conflict outcomes initiated by either side against the other. The author has chosen to replace the war^{I} outcome with $conflict^{I}$. This is the first adaptation of the International Interaction Game. The reasons for this will be explained later. The outcomes are defined as:

SQ – the maintenance of the *status quo*. This cost/payoff is regarded as known. An otherwise beneficial *status quo* can be upset by a perceived need for action even in situations in which benefits are not assured nor threats imminent.

ACQ^{Russia}, ACQ^{US} – the *acquiescence* of the nation as indicated by the superscript. The cost of this decision is regarded as known, or more aptly knowable. Any probability associated with the cost/payoff is minimal.

NEG – the decision to pursue a *negotiated* settlement. Negotiations are contentious. Payoffs from negotiated settlements can vary significantly, possibly having less value than the *status quo*. A notable historical illustration of this contention is Jay's

Treaty (of 1794).[13] Negotiations have a probabilistic cost/payoff. In negotiations payoff is conserved; both players cannot gain more than the value of the *status quo*.[14]

CAP^{Russia}, CAP^{US} – the *capitulation* of a nation to the other, where the capitulating nation is indicated by the superscript. This is the least preferred outcome for a nation.

$Conflict^{Russia}$, $Conflict^{US}$ – the initiation of a conflict by the nation in superscript.

A conflict does not have to be armed, nor does it have to escalate to a declaration of war. Weapons of conflict can include any instrument of national power.[15] In this research military (US) and diplomatic (Russian) instruments are believed to be the most likely. This concept is built into the payoff structure. The US prefers: $Conflict^{Russia} > ACQ^{US} > CAP^{US}$. This expresses the US belief that a US – Russian conflict will not escalate to an armed military conflict between the two nations. There are additional beliefs expressed in the preferences. The following explains these preferences.

2. NATIONAL PREFERENCES (US AND RUSSIA)

National policy preferences coalesce around national values, culture and social norms. In this way the outcome preferences for any two nations will be dissimilar. Some nations, like Sweden and Ireland, maintain a policy of neutrality and are unlikely combatants when compared to their regional counterparts not to mention others in the

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[13] Supreme Court Chief-Justice John Jay negotiated a treaty between the United States and Britain in 1794. The treaty was extremely unpopular. The major US benefit from the treaty was that the US was not drawn into the French Revolutionary Wars (1792-1802).

[14] In *War and Reason*, Bruce Bueno de Mesquita allows for a synergistic SQ payoff, this is referred to as policy harmonization (Cooperation Proposition 4.2). This is an agreement where neither player sacrifices. This proposition supports negotiated outcomes in political impasses such that negotiation is preferred over the SQ, and better than forcing capitulation.

[15] The commonly accepted instruments of national power include: diplomacy, information, military and economic. Collectively they are referred to by the acronym DIME.

international community. Others have a realists view of war, expressed in the oft quoted Clausewitz, "... a continuance of politics by other means".

a) Preferences – qualitative interpretation

The two enumerations below provide the ordered outcome preferences for each nation. This is the second adaptation of the International Interaction Game. The preferences for player ***B*** (Russia) match those outlined in *War and Reason*; but the preferences for player ***A***, the US, differ slightly [4]. In *War and Reason* player ***A*** prefers $CAP^A > War^B$. This is not the case for the thesis, as illustrated below. The implications of this will be discussed in II.A.1 and II.A.2.

The qualitative preferences assigned to the US are:

$ACQ^{Russia} > CAP^{Russia} > NEG > Conflict^{US} > SQ > Conflict^{Russia} > ACQ^{US} > CAP^{US}$

The qualitative preferences assigned to Russia are:

$ACQ^{US} > SQ > CAP^{US} > NEG > Conflict^{Russia} > ACQ^{Russia} > Conflict^{US} > CAP^{Russia}$

These qualitative preferences are mapped into eight subsets of a single superset [0, 100]. An ordered enumeration of the outcomes and their respective payoff ranges are provided in section II. B. Figure 7 illustrates their mapping onto the Thesis Game Tree.

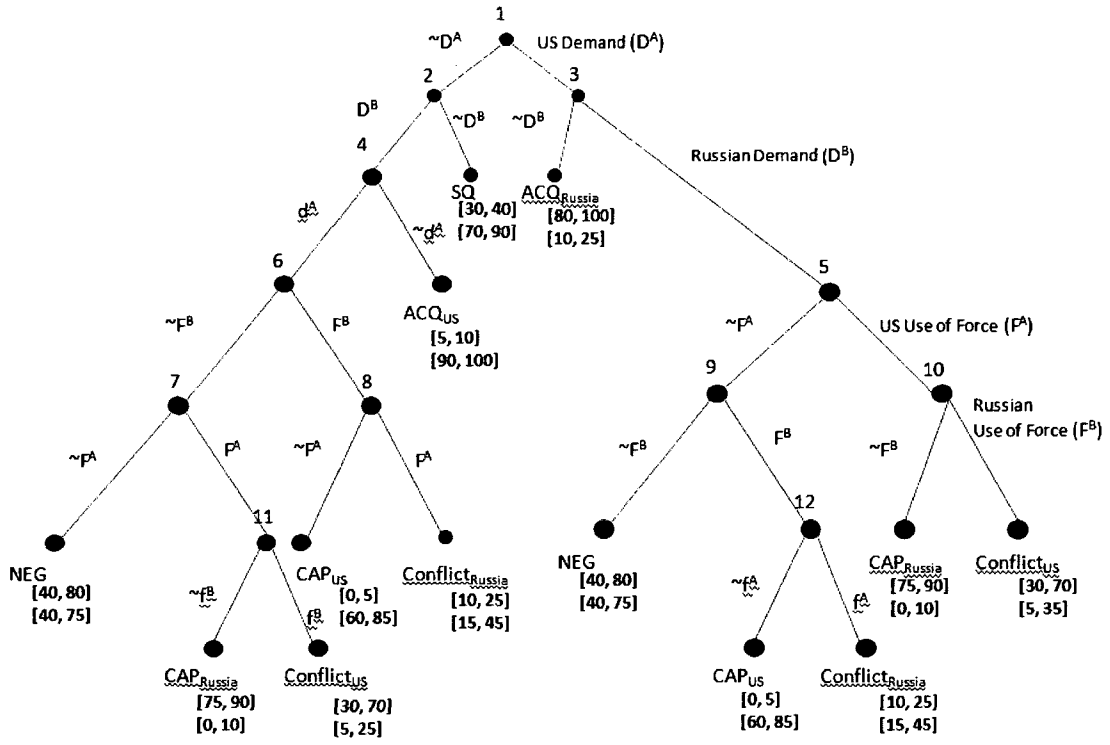

Figure 7. Thesis Game Tree with outcome sub-set payoff ranges
Source: by the author

Later, the mean value of each outcome payoff ranges will be computed and assigned to that particular outcome within the Thesis Game Tree. Subsequently, the game can be solved by-hand. Prior to that, further explanation of the qualitative preferences for the two nations will be provided. The following narrative describing the national preferences was determined by the author following an analysis of the qualitative literature. This analysis was used to set the payoff ranges associated with each of the thirteen outcomes.

US Preferences

US preferences indicate a hesitance to compromise on issues regarding the threat of radical Islam. Specific to the *status quo* (*SQ*) Zbigniew Brzezinski is quoted as stating, "... the status quo was killing us" [5]. The US prefers *negotiation* to *conflict* but, is unwilling to accept the *status quo* of an Islamist safe-haven in Chechnya. Recall that from the US perspective: $NEG > Conflict^{Russia} > ACQ^{US} > CAP^{US}$. *Acquiescence* and *capitulation* by Russia might harm long term relations with Russia. But, it could also bolster US political power regionally and globally. A successful, (US) favorable diplomatic outcome (*NEG*) to this crisis could provide a net gain in US domestic capital. However, US – Russian *negotiations* have not been beneficial to the US in recent history. This is modeled by the relatively large degree of uncertainty regarding the US payoff, as expressed by the difference between the upper and lower bounds to that payoff range. Likewise, though *NEG* is strictly preferred to *conflict* an examination of the payoff ranges for these outcomes reveals that it is not preferred by much, as measured by the median value. Probabilistic outcome values allow for chance instances in which the US prefers *conflict* to *NEG*. Consider that the current administration has given much to Russia, but has received little in return; at least this is the current domestic consensus.[16] When considering the two *Conflict* outcomes, a conflict initiated by the US ($Conflict^{US}$), a limited US military operation targeted at the Islamist safe-haven in Chechnya could be "cheap", final and achieve the same strategic ends as that of a drawn-out *negotiation*.

[16] The US has decided to forego a European missile defense shield, a decision that pleased Vladimir Putin but angered many Americans and the nations of Poland and Czech Republic. The Obama administration has agreed to allow Russian weapons inspectors' access to US nuclear weapons. Finally, Russian support for tough sanctions against Iran appears to be uncertain (as of 20 October 2009). Russian diplomats have characterized these discussions as "counter- productive".

And, then there is a $Conflict^{Russia}$ outcome. In this outcome the Russian government initiates a second "Cold War," possibly by sponsoring the Islamists in Chechnya. In either case of *conflict*, the US does not believe the *conflict* will escalate to armed military conflict.

Russian Preferences

Russia indicates a preference for the *status quo* over most other outcomes. If the US does not make a demand Russia will choose to maintain the *status quo*. Examining the payoffs, Russia prefers only ACQ^{US} over SQ. Russia just ended its almost fifteen year military operation in Chechnya in April 2009. The author contends that Russia is looking for a period of relative peace. A *capitulation* by the US (CAP^{US}) might come with political gains; but it is likely that these gains will be accompanied by real, tangible costs. Next, a *negotiation* (*NEG*) could provide for joint US - Russian action. But, it would include Russian guarantees and Russian action based on the condition that the US not involve itself in Russia's sphere of influence (SOI). A conflict outcome can be beneficial for Russia. And, as will be shown later, the model allows for instances where $Conflict^{US}$ [5, 35] is preferable to $Conflict^{Russia}$ [15, 65].

The initiation of a Russian conflict at node 12 is defensive, intended to preclude future US operations in the Caucasus. In this scenario when Russia issues a counter-demand (D^B) the US decides not to escalate and use-force ($\sim F^A$ off of node 5). At node 9 Russia escalates (F^B), moving the game to node 12. This could be the aforementioned "Cold War" scenario, a situation in which Russia decides to support Islamists in Chechnya to prevent, or foil, a US military operation in Chechnya. This could have the

added benefit of limiting Islamist attacks into Russia. Would the Islamists "bite the hand the feeds them"? This places the US in the position of deliberating over two difficult options: inaction and possible attack; or action and a potential conflict with Russia. A Russian *acquiescence* (ACQ^{Russia}) takes the form of Russian military action against the Islamists in Chechnya. Russian *acquiescence* (ACQ^{Russia}) to US demands (D^{A}) for meaningful action against the threat has a probabilistic cost. A costly war could entangle Russia in an unpopular war in Chechnya - again. Worse yet, it would be at the behest of the US. Least preferred is Russian *capitulation*. When examining Russia's last three outcomes (CAP^{Russia}, $Conflict^{US}$, ACQ^{Russia}) it is helpful to consider that only recently has Russia begun to play a larger role in global affairs. As little as four years ago Russian considerations were disregarded out-of-hand by the US. Russia does not want to go backward; it has taken many years for Russia to rebuild its position in the international community since the fall of the USSR [6].

Although this thesis relies heavily on the work done by Bueno de Mesquita in *War and Reason*, this model contains numerous departures from the International Interaction Game. Notably the Thesis Game Tree uses probabilistic payoffs. Below is a review of three other adaptations to the International Interaction Game and some generalizations about the Thesis Game Tree.

First, the War^{I} outcomes from the International Interaction Game have been changed. To reduce confusion they will be referred to as $Conflict^{I}$, a conflict initiated by "I". The conflict outcome, in real terms, is the actual use of force or the beginning of a second Cold War. The author contends that it is unreasonable to expect that Russia

would attack the US in this scenario; this belief is reflected in the payoff structure. For instance, the $Conflict^{Russia}$ outcome of node 12 is more akin to the Cold War between the periods 1947 to 1979, again it does not suggest a Russian invasion of either the US or Europe. Additionally, use-of-force needs to be clarified.

The use of force, or the F^I branches in the International Interaction Game, equates to the use of an instrument of national power by one nation to compel the action of the other. For this research force includes such strategic events as aggressive troop movement or similar policy actions. Thus, the deployment of a US airborne division to Azerbaijan is defined as a use-of-force (UOF), as would tacit Russian approval of Islamists in Chechnya. A policy of compellence, the credible threat of actual UOF, is included as a UOF. Second, this thesis explicitly uses the domestic version of the International Interaction Game. In this version of the International Interaction Game leaders (players) consider the will of their constituents. This valuation of public will is expressed as domestic political capital. Leaders gain or lose domestic political capital as a result of the decisions they make. Second, the Thesis Game Tree attaches a range of outcome payoff values to specific policy outcomes as opposed to assigning strict ordinal preference, or value. The structure and payoffs of the model creates the following conditions.

Initially the left-side (non-violent) of the International Interaction Game is included in this thesis. Because of outcome payoff ranges for the US and Russia, progress down this branch of the game is less probable than down the right-side (violent). This is a result of the US preference of: $Conflict^{US} > SQ$ and Russia's proclivity for the

status quo. Specifically, an Islamist safe-haven in Chechnya is regarded as a threat to US national security; and, action must be taken. From the Russian perspective a threatening Islamist safe-haven in Chechnya is not new. But, US operations and long-term presence in Chechnya could be more damaging to Russia than the *SQ*. The second generalization regards *conflict* and *NEG*.

The third adaptation is that the US does not prefer CAP^{US} to $Conflict^{Russia}$. This is a change from *War and Reason*. And, as mentioned this preference reflects the US belief that Russia will risk an armed military conflict over US operations against the Islamist safe-haven in Chechnya. A *negotiation* following along the non-violent left-branch appears improbable. But, it appears probable following along the violent right-branch. The US payoff ranges between *NEG* [40, 80] and $Conflict^{US}$ [30, 70], illuminate instances where $Conflict^{US}$ could be valued over *NEG*.

In the next section the preferences will be mapped to sub-sets of a power set [1,100]. The value for each payoff, as perceived by the US and Russia, exists as a payoff range with a minimum value, median value and a maximum value. These sub-sets intersect, thus a value can be shared between numerous outcomes. For example, from Russia's position a "good" $Conflict^{US}$ can be of equal (or greater) value when compared to a ACQ^{Russia}. This goes against the strict ordinal preferences defined in *War and Reason* and many Game Theory models. As such this models uncertainty and is the third adaptation to the International Interaction Game.

b) Preferences – quantitative representation

The qualitative preferences are completely enumerated by the thirteen outcomes *(O_x)*. Eight of the thirteen outcomes are unique. All of the outcomes are bounded intervals which are a subset of the larger set of values [0,100]. For example, the US's perception of ACQ^{Russia} is represented as [80, 100] $\in$ [0,100]. Some of the subsets overlap. This overlap allows for set intersection and the possibility of outcomes with equivalent payoff. The set mapping from qualitative preference to quantitative value is a surjection. Every element of the domain (preferences) maps to at least one element of the range (outcome payoff value).

In summary, the value of any payoff is defined between zero and one-hundred inclusive. This value exists in a given range of continuous real numbers, and is contained in a bounded set; member elements (values) can be shared between multiple sets, an intersection of two sets. The collection of these sets is complete, forming another set, the power set.

The relationship between outcomes payoffs is a natural, representative expression of payoffs associated with complicated decisions. Payoffs are expressed as a subset of the set [0,100]; they have a payoff range as opposed to a unique value. Since intersection is allowed there exists the possibility of payoff equivalency among different decisions. The preferences' for the two nations are defined quantitatively as:

1.) US Preferences

$ACQ^{Russia} \rightarrow [80, 100]$

$CAP^{Russia} \rightarrow [75, 90]$

$NEG \rightarrow [40, 80]$

$Conflict^{US} \rightarrow [30, 70]$

$SQ \rightarrow [30, 40]$

$Conflict^{Russia} \rightarrow [10, 25]$

$ACQ^{US} \rightarrow [5, 10]$

$CAP^{US} \rightarrow [0, 5]$

2.) Russian Preferences

$ACQ^{US} \rightarrow [90, 100]$

$SQ \rightarrow [70, 90]$

$CAP^{US} \rightarrow [60, 85]$

$NEG \rightarrow [40, 75]$

$Conflict^{Russia} \rightarrow [15, 45]$

$ACQ^{Russia} \rightarrow [10, 25]$

$Conflict^{US} \rightarrow [6, 35]$

$CAP^{Russia} \rightarrow [0, 5]$

The preferential range for these subsets is derived and attached to the Thesis Game Tree (Figure 8). Payoffs to the US are expressed above the payoffs to Russia. And, red nodes are Russian decision nodes; blue nodes are US decision nodes.

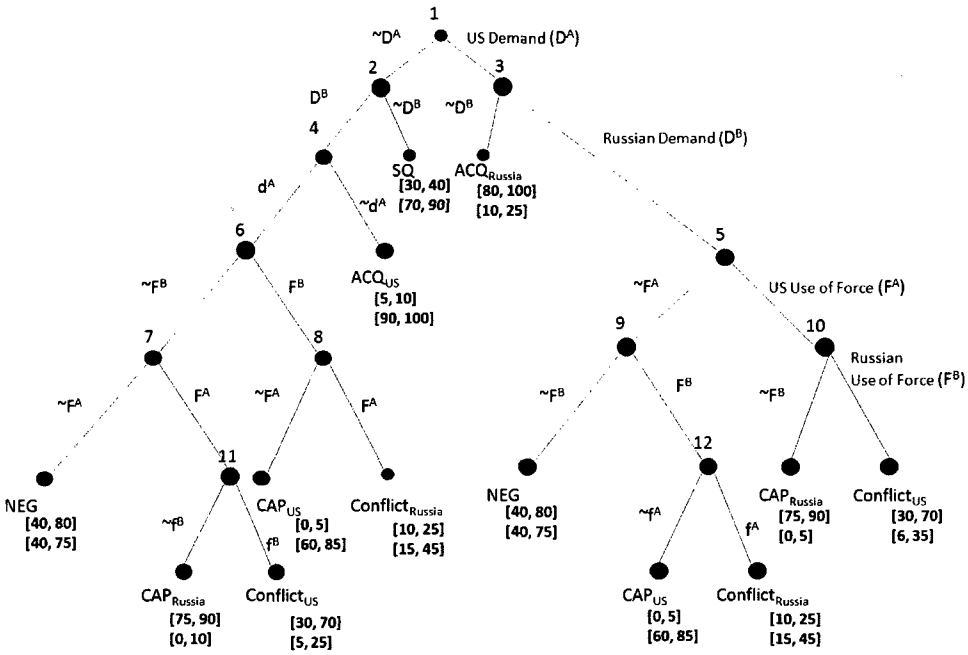

Figure 8. Thesis Game Tree with preferential outcome value ranges
Source: *by the author*

A decision maker assumes that the midpoint is the expected value of the probabilistic interval, and thus a good point estimate of the probabilistic interval [7]. The true payoff has an equal likelihood of being greater than or less than the midpoint. Uniform distributions will be used to map outcome payoffs. For a Uniform distribution the mean value and midpoint are synonymous. This instance of the Thesis Game Tree, where all payoff values assume the midpoint, will be used as an example in the next section, section III. As mentioned earlier probabilistic payoff values allows for payoff equivalency between different decisions. This is probabilistically unlikely; and, realistically players will always have a preference. In these rare instances another decision mechanism could be used, or decisions could be determined be risk tolerance. More likely, and more interesting, is the possibility that payoffs, hence preferences, will

be reordered with every instance of the simulation. For the moment disregard the game tree and look-at Figure 9. Consider Russia's preferences *SQ*, *NEG* and CAP^{US} there is a shared payoff space between these three decisions (Figure 9).

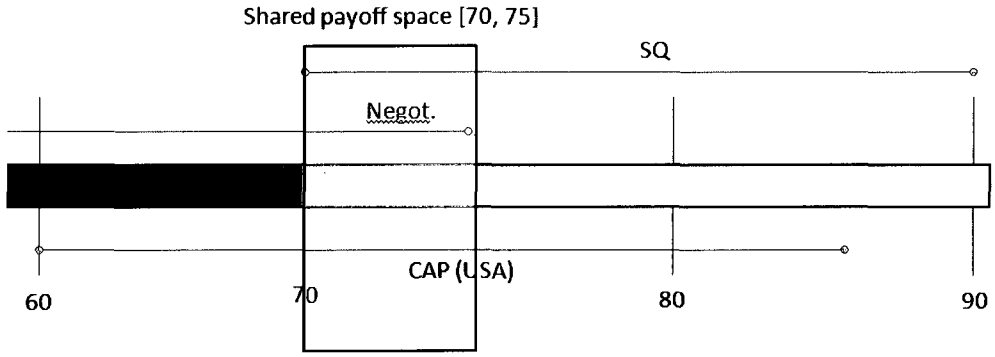

Figure 9. Equivalency in Russian payoff space
Source: by the author

This figure (Figure 9) illustrates that Russia's subjective payoff valuation for a *SQ*, *NEG* and CAP^{US} outcome can be equivalently valued in different instances of the game. What is more likely is that CAP^{US} assumes a high value simultaneously with a low value for *NEG*. This could make $Conflict^{US}$ the equilibrium outcome. The US, fearing a Russian attempt at CAP^{US} at node 9 would chose F^{A}.

3. THE GAME TREE: AN EXAMPLE AND THE FINAL MODEL

Section 3. presents examples of the Thesis Game Tree model. The first example uses median values from the player's respective outcome payoff ranges as the perceived payoff value. The examples in this section are explained through forward induction. The following scenario in (a.) the median value scenario should be read as a narrative with the reader considering the leader's attempts at formulating a national policy based on the

evidence and assumptions at-hand. Section B examines a type of dichotomous fear during policy formulation, an aversion towards exploitation during a negotiation, and the angst (or lack of) associated with the possibility of war. This fear (or lack of) informs a leader's decision-making, thus affects their ordering of outcome preferences.

a) An example instance of the model using mean values

What follows is an example of the decision game using the mean values (in this instance synonymous with midpoint) for the probabilistic outcome payoffs. This example is explained through forward induction. But, the game was solved by backward induction. Backward induction will be discussed in some detail later.

This researcher provides the US the first move. Knowledge, perceived threat, of an Islamist strategic safe-haven in Chechnya is considered the move by Nature, the event that begins the decision game. Given the initial conditions the US begins the game by advancing down the right-side of the Thesis Game Tree (Figure 10).

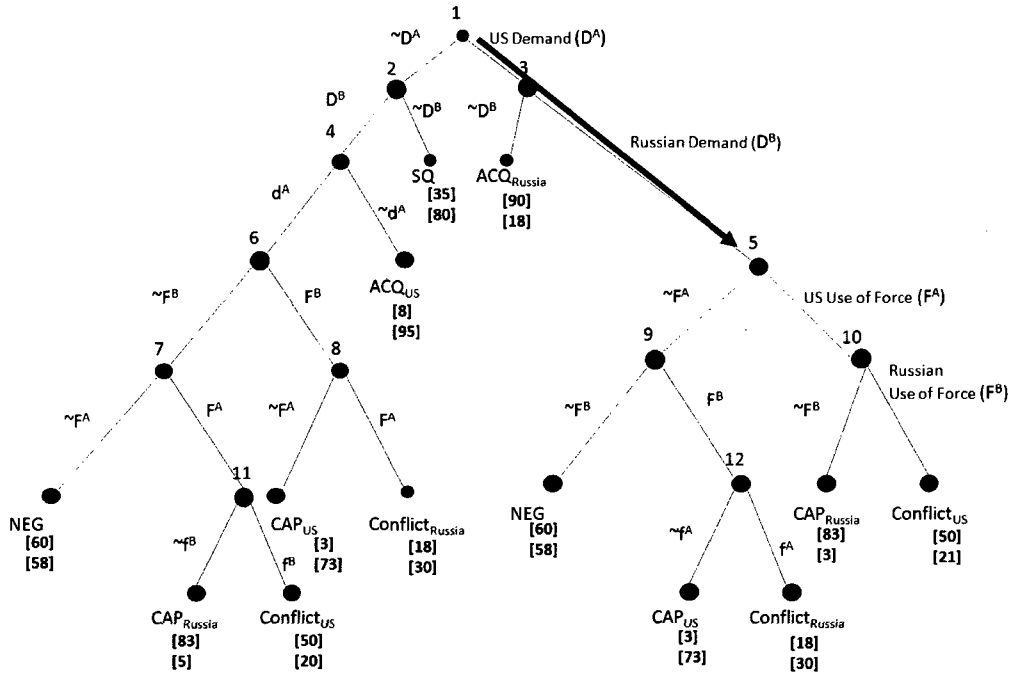

Figure 10. The Thesis Game Tree using preferential median values for outcome payoffs
Source: by the author

The model reflects that US domestic policy requires the defeat of Islamists; recall that from the US perspective: $NEG > Conflict^{US} > SQ$. If the US were not to demand from node 1, then Russia would not either. Russia knows that progressing the game past node 2 is not in its advantage. The US doesn't like the *status quo*, as a matter of fact, the US prefers $Conflict^{US}$ [50] to SQ [35]. The US (D^A) demands that Russia address its concern.

A US demand followed by Russian *acquiescence* (ACQ^{Russia}) that is, Russia agrees to defeat, isolate or dislocate Islamists within its sphere of influence is possible in the Thesis Game Tree game. In this specific version of the game ACQ^{Russia} is a dominated course of action. However, consider that US policy makers, uncertain of Russian payoff values, might believe a Russian *acquiescence* a reasonable Russian decision. In this

instance: 1) the US recognizes Russia's role in the region and thus its policy supremacy in the Caucasus; 2) Chechnya has been a security concern for Russia since 1818 and; 3) in general the US and Russia agree that radical Islamic terrorism is a threat to each state's individual national security and regional stability.[17] These three instances illustrate the incomplete information as modeled in the thesis model. Defeating militant Islam and stabilizing the Caucasus should be a shared goal [8]. The concern of the two parties becomes *who* (which nation) *decides what* is considered "stable."

Russia views things differently: 1) it has been involved in conflicts in Chechnya since 1994; 2) it views agreeing to US demands as risking domestic anger; 3) it considers US policy towards Afghanistan, Chechnya, the Middle-East, and Central Asia as hypocritical [9] and; 4) US and Russia have not been able to execute on past agreement, they have not taken joint action even when consensus had been achieved [10].

Russia will not *acquiesce* to US demands. The probabilistic median value for a ACQ^{Russia} is [18] compared to a probabilistic median value of [21] for $Conflict^{US}$. As mentioned earlier ACQ^{Russia} is dominated. As payoffs are expressed as a subset of values, not a single unique integer, from Russia's perspective a good $Conflict^{US}$ (MAX[35]) is preferred to a bad ACQ^{Russia} (MIN[10]). This was first reported by Lalman, namely that decision-maker with a higher utility from war can go to war in situations of "incomplete information" [11]. The Thesis Game Tree is advanced to node 5 by a Russian counter-

[17] Russia threatened attacks against Chechen allies, specifically Afghanistan in May 2000, for their material support of the Chechen rebels (Womack, 2000). Every President of the Chechen Republic of Ichkeria from 1994 to 2001 has allegedly met with Osama bin Laden. As noted in Chapter 2 the Second President of the Chechen Republic of Ichkeria (Yandriejev) appears to have had close ties with the Taliban and Al-Qaeda. Recall from Chapter 2, the reports placing Osama bin Laden in Chechnya after the fall of the Taliban in Afghanistan (Souleimanov and Ditryvh, 2008). Finally, there are rumors, denied by ISAF, of Chechen fighters in Afghanistan.

demand (D^B) at node 3. The game has entered the crisis sub-game (Figure 11). Payoffs to the US are expressed above the payoffs to Russia.

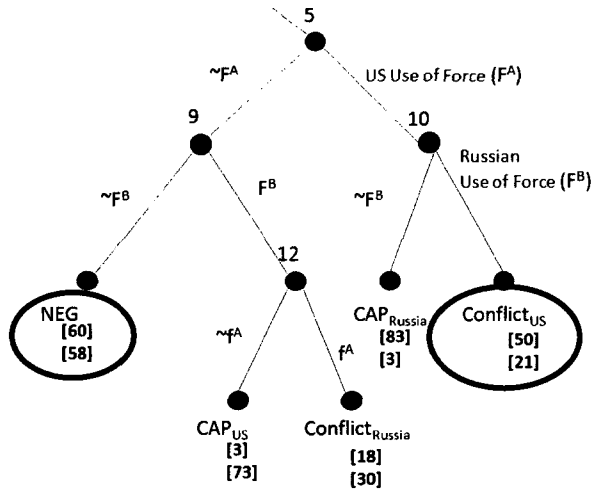

Figure 11. The crisis sub-game of the Thesis Game Tree – US choices.
Source: by the author

The Russian counter-demand (at node 3) could be an insistence that the US remain out of the Caucasus while allaying the perceived Islamist threat. The US decides on the move from node 5. Expecting Russia *to negotiate*, from node 9 (a possible equilibrium point) requires that Russia not attempt to exploit the US and force a US move from node 12. Assuming that Russia values *NEG* more than $Conflict^{Russia}$ the US chooses not to use-force at node 9. At node 9 Russia has to evaluate its payoff value of [58] for *NEG* against $Conflict^{Russia}$ [30]. The *NEG* outcome is preferable. Russia decides not to use-force. The solution to this game is a *negotiation*. Though this was explained from the move by Nature at node 1 to its conclusion at *NEG*, this game was solved by backwards induction beforehand. The game is rolled back from the outcomes.

b) "What-if" – fear of exploitation and preference for conflict

Though the sub-game perfect equilibrium is achieved through *negotiation* (in this particular instance) the reality of regional and domestic politics makes favorable negotiations problematic. Both sides require concessions by the other. Negotiations take time, eliminating the element of strategic surprise. The reader is asked to consider the following as it directly pertains to the creation of this model.

The US understands that Russia may not *capitulate* (CAP^{Russia}) because Russian capitulation to the US would damage Russia's influence in the region. However, as mentioned previously, the US cannot allow itself to be forced into a bad political decision from node 12. An examination of the utility spread for the US between $Conflict^{US}$ (MAX[70]) and *negotiation* (MIN[40]) reveals a large spread. Without a strong position during a negotiating a US initiated conflict is a reasonable outcome. Exploitation during a negotiation maybe less-preferred than a conflict. At node 5 the US perceives three outcomes down the $\sim F^{A}$ branch. *NEG* is always preferable to the other two; they are dominated by *NEG*. An examination of the payoff ranges reveals that: 1) the US will ***never*** choose CAP^{US} over $Conflict^{Russia}$ and; 2) Russia will never choose CAP^{Russia} over $Conflict^{US}$. These decisions are pruned away leaving the following choices for the US at node 5 (Figure 12).

Figure 12. "What-if" - dominated choices removed
Source: by the author

The literature and contemporary history support this type of scenario. Consider that: 1) despite the fact that Russia does not support new sanctions against Iran a majority of Americans (61%) do support military action against Iran (10/6 Pew poll); 2) by a margin of two to one, US presence in Iraq is viewed by Russians as a threat to global security, more so than a nuclear Iran [12]; 3) Russia has, and may still, sell arms to Iran, North Korea and Venezuela and; 4) Russia has provided little support to the NATO-led War in Afghanistan. Ironically, US efforts in Central Asia could produce an 'end' greater than what Russia sought in 1979, namely the removal of the terrorism (and the Taliban), the creation of a stable but feeble Afghanistan, a weakened NATO, and an exhausted US. In this very specific "what-if" scenario, the author contends that for all of these reasons a negotiated settlement would not be reached; this conclusion, under similar circumstances has also been reached by Bueno de Mesquita [13].

Unique national mixtures of divergent foreign and domestic policies drive decisions in the game. The Russians view Iran as a responsible nation in the international community. Conversely, the US view's Iran as an emergent threat with a possible nuclear capability. Also noteworthy is the fact that the Russian Federation has managed

conflicts with radicalized Muslim groups along its Southern periphery since 1991. Afghanistan and Chechnya have been partners since 2000; most likely the relationship has earlier origins [14]. To Russians radical Islam in the Caucasus is nothing new; and, relations between al-Qaeda and Islamists in Chechnya is not new either. From Russia's perspective, the US choice to make Islamists in Chechnya an issue now seems to obscure US motives in the region. Proof of this lies in the fact that the US was openly critical of the Soviet-Afghanistan War, both Chechen Wars, and the threatened Russian attacks of May 2000 into Afghanistan against the Taliban and al-Qaeda.

From the US point of view Russia is an antagonist, set on thwarting US progress and determined to undermine US national interests [15],[16]. First, Russia provides weapons to Iran, who in-turn provides weapons to insurgents in Iraq and Afghanistan for use against American soldiers. Second, Russia uses its export of natural gas to former Soviet states as an enticement, the most immediate example being gas shipments to Ukraine in 2009. Third, Russia also attacked Georgia in the summer of 2009. Georgia is a US regional partner. The instigator and cause are debated, but Russia, by treaty obligation, should have removed its forces from South Ossetia years ago. Fourth, Russia consistently votes against the US in the UN Security Council. Russia insists that Georgia and Ukraine not become members of NATO, an outright attempt to influence Western policy towards Georgia and Ukraine. Russia opposed the proposed ballistic missile defense shield to be built in Eastern Europe, specifically in Poland and the Czech Republic, a shield that possessed no threat to Russian nuclear deterrence. Russia continues to attempt to corner the European energy market, thus gaining economic

influence with the EU. Finally, Russia has participated in naval exercises with Venezuela, while neither a seriously challenge nor threat, it did draw attention. In short Russia has contented itself with blocking US efforts whenever and wherever they may be.

It is becoming apparent that the value that each nation places on a *negotiate* settlement is an important factor in the outcome of the conflict. This is expected to be the case for the simulation. It is believed that the majority of simulated solutions will be a negotiated (*NEG*) settlement or $Conflict^{US}$. An ACQ^{Russia} is also possible. Likewise, but from the other side of the model it is highly improbable that a *SQ* outcome will ever be observed.

c) The final version of the Thesis Game Model

After the two examples, the midpoint payoff example from 3a. and; the "What-if" scenario from 3b., a few realizations regarding the structure of the game tree emerge. Examining the violent right-side of the game tree reveals that the two capitulation outcomes will never occur (Figure 8). Both nations can always do better than capitulation. This situation is reported in *War and Reason* by Domestic Proposition 3.3 [17]. Capitulation is not an equilibrium point given fully informed players. While the players deal with uncertainty they are still, by definition, fully informed.

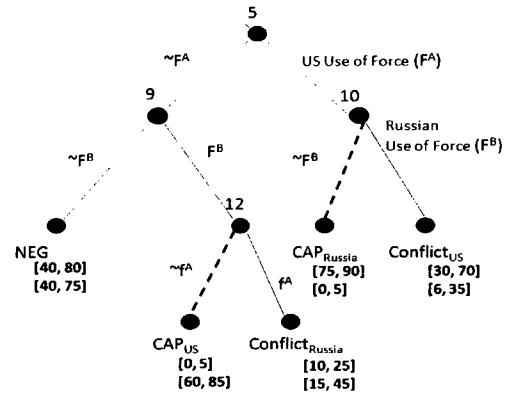

Figure 13. Capitulation outcomes are dominated
Source: by the author

Additionally, an examination of the non-violent branch reveals more dominated courses of action (Figure 13).

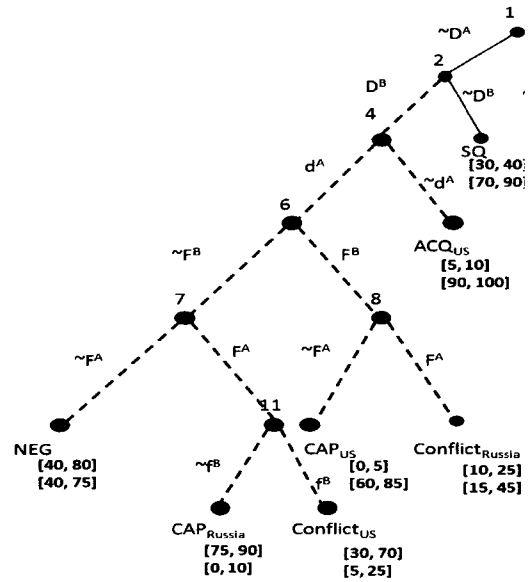

Figure 14. Dominance of the violent right-branch
Source: by the author

The non-violent left-branch of the game (Figure 14) is almost completely dominated by the violent right-branch. If the US were to ($\sim D^A$) Russia would ($\sim D^B$).

There is no intersection in Russian payoff values for the *SQ* and ACQ^{US} sub-sets, and $ACQ^{US} > SQ$. If Russia were to (D^B) from node 2 the US would play tit-for-tat and (d^A) at node 4. At node 6 Russia knows that US will (F^A) at node 8 if Russia (F^B) at node 6. The best course of action for the US and Russia would be a tit-for-tat sequence towards a *NEG* off of node 7. As fully informed players Russia will always $(\sim D^B)$ at node 2. Recognizing this US will rarely $(\sim D^A)$ at node 1. A *SQ* equilibrium outcome is possible, but highly improbably. This improbable event would occur when the following conditional preferences are met:

for US:

$$ACQ^{Russia} > SQ \geq NEG > Conflict^{US} > Conflict^{Russia}$$

for Russia:

$$SQ > Conflict^{Russia} > NEG > ACQ^{Russia} > Conflict^{US}$$

Recall that there is little intersection of US values for *SQ* [30, 40] and *NEG* [40, 80]. Given full information the US will choose *SQ* as would Russia. The pruned version of the Thesis Game Tree is shown in Figure 15.

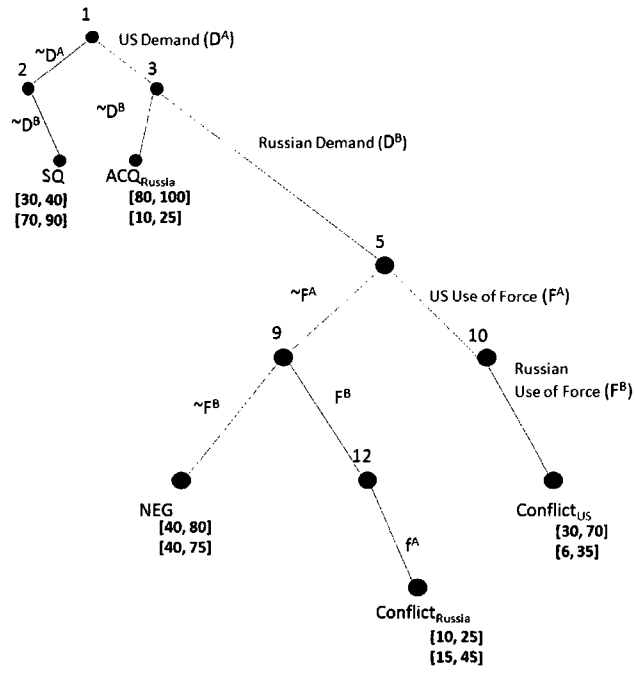

Figure 15. The pruned final version of the Thesis Game Tree
Source: by the author

The Domestic Proposition 3.6: Basic Status Quo Theorem supports the earlier statement [18]. It is possible for the US to equivalently value *NEG* [40, 80] and *SQ* [30, 40]. Specifically, the Thesis Game Tree can fill the requirements for (SQ outcome) Case 3, the additional constraints for the US: $Conflict^{Russia} > CAP^{US}$ and Russia: $Conflict^{US} > CAP^{Russia}$, $SQ > NEG$ [19].

This is the final version of the model (Figure 15). This version of the Thesis Game Tree will be used in the simulation study. The author recognizes that $Conflict^{Russia}$ is not a complete information equilibrium point. This conclusion coincides with the Domestic Proposition 3.2: Secondary War Theorem [20]. It remains an example of a policy mistake by the US. An instances in which the US expects Russia to negotiate, when their ($\sim F^A$) is unexpectedly answered with (F^B).

Notes

[1] Bueno de Mesquita, B., and D. Lalman *War and Reason: Domestic and International Imperatives*, p. 40. New Haven: Yale University Press, 1992

[2] Ibid, 104

[3] Ibid, 72

[4] Ibid, 49-50, 72

[5] Brzezinski, Z., and B. Scowcroft *America and the World: Conversations on the Future of America Foreign Policy*, p. 22. New York: Basic Books, 2008

[6] Legvold, R. *Russian Foreign Policy in the Twenty-First Century and the Shadow of the Past*, p. 313, 317-327. New York: Columbia University Press, 2007

[7] Brams, S .J. *The Presidential Election Game*, p. 4-6. Massachusetts: AK Peters, Ltd., 2008

[8] Nation, C .R. "The United States and the Caucasus", p. 6. Strategic Studies Institute, http://www.strategicstudiesinstitute.army.mil/pdffiles/pub764.pdf, accessed 23 January 2009

[9] "Parting with Illusions: Developing a Realistic Approach to Relations with Russia", p.8

[10] Gvosdev, N. "Parting with Illusions: Developing a Realistic Approach to Relations with Russia", p. 4. Policy Analysis 611: *CATO Institute*, 611 (February 2008)

[11] Bueno de Mesquita, B., and F .N. Stokman *European Community Decision Making: Models, Applications and Comparisons*, p. 74. New Haven, Yale University Press, 1994

[12] "Parting with Illusions: Developing a Realistic Approach to Relations with Russia", p. 8

[13] *War and Reason*, 110-111

[14] Souleimanov, E., and O. Ditryvh. "The Internationalism of the Russo-Chechen Conflict: Myths and Reality", p. 1207 and 1216. *Europe-Asia Studies*, 60 (7,2008): 1199 - 1222

[15] Sestanovich, S. "What has Moscow Done?" p. 22-23, 28. *Foreign Affairs*, 87 (6,2008): 13-28

[16] "Parting with Illusions: Developing a Realistic Approach to Relations with Russia", 13

[17] *War and Reason*, 79

[18] Ibid, 85

[19] Ibid, 85

[20] Ibid, 78

CHAPTER FOUR

ITERATING THE MODEL - THE SIMULATION STUDY AND RESULTS

Four simulations were created for this research: the Thesis Game Tree; the Mean Value Game; and two what-if scenarios. All of the simulations are automated abstractions of the sequential Thesis Game Tree is presented in the previous chapter. In the (simulated) games players make decisions' in order to maximize their payoff. Payoffs are randomly generated and attached to each of the five non-dominated outcomes (refer to Figure 15). Each game is solved through backward induction. In this way arriving at the solution to the game provides the strategy that each player will use. Backward induction will be discussed in more detail in the next section.

All three stochastic games follow a similar simulation methodology. Each of these simulation experiments contains 30 trials of 30 iterations per trial. The quantitative data produced by the simulations is independent and identically distributed (IID). Thus the use of certain statistical tests is appropriate. Similarly the Law of large numbers (LLN) suggests that over a sufficiently large number of trials the average result will approach the expected value. The number of trials and iterations was chosen so that they would be statistically meaningful and subject to statistical analysis. On the other hand, the Mean-Value Game was only iterated once. The deterministic nature of the Mean-Value Game allows for a single, stable solution.

The Mean-Value Game was created to validate the mechanics of the spreadsheet simulation. The what-if scenarios were developed to explore policy possibilities, and to

provide predictive insight into the Thesis Game Tree. These scenarios address questions such as: (1) What-if Russia and the US were less certain of the payoff values associated with the prominent outcomes and; (2) What-if the US's preference for the *SQ* was increased. The answer to these questions provides insight into policy formation during conflict. Namely, ***player A***'s national policy, though unpopular with its competitor (***player B***), might be achievable provided enough effort by (***player A***) and incentive given to ***player B***. This leads to concepts such as: predetermined decisions, threats, and side agreements.

1. SIMULATION COMMNETARY AND CONSTRUCTION

The four simulations are Monte Carlo spreadsheet simulations executed in Microsoft Excel. Excel was chosen because it is readily available and familiar to most students. The Mean-Value Game will be discussed first.

In the Mean-Value Game the outcome payoff range was set to the mean value of their specific range (midpoint value). In this way the results from this deterministic spreadsheet simulation can be compared to the manual solution obtained in Chapter 3. If the results are identical the backward induction logic used in the spreadsheet simulation is without semantic error.

a) Generating and mapping the data

Excel generated ten pseudo-random variables and mapped them to a Uniform distribution. The ten variables represent the ten outcome payoffs, five possible pure strategy outcomes for each of the two players. These random variables where mapped to their preferential ranges as described in the previous chapter using equation 1.

$$y = a + x(b - a) \tag{1}$$

where a = lower boundary of the range, b = upper bounds of the range and x = is the psuedo- random variable produced by Excel. As an example, Russia's payoff perception of a *SQ* outcome is [70, 90]. Thus, in Excel the expression is (Equation 2).

$$y = 70 + RAND(90 - 70) \tag{2}$$

This was true for the 900 instances of the Thesis Game Tree simulation (30 trials containing 30 iterations per trial). In the what-if scenarios these ranges were changed slightly. This was done to examine changes in policy and game outcome, resulting from the manipulation of the probabilistic payoff ranges. Once outcome payoff values are generated all that remains is solving the game. All versions of the game were solved through backward induction.

b) Backward induction and its application in the simulation

Backward induction consists of solving the game model from the bottom – up, from the last decision to the first. With sequential decision nodes the player (***B***) responsible for the bottom-most, last decision compares the two alternative payoffs values (perhaps outcomes ***#1***and ***#2***) associated with its decision. Player ***B*** is a subjective expected utility maximizer. For the sake of this example outcome *#2* provides the maximum subjective expected utility (2 utils); player ***B*** will choose outcome ***#2***. This

node, ***node 3***, has a value for both players ([2, 2]) in this example. Player ***A*** now must choose between the value it would receive at ***node 3***, 2 utils for a tit-for-tat strategy, or pursuing a policy of its own creation (perhaps an outcome of value 1 util). This choice rolls the game back to node 2; the value of the game now exists at ***node 2***. In this example player ***A*** would choose a tit-for-tat strategy, conceding to player ***B***'s choice (as [***2*** > ***1***]). Now player ***B*** must choose between the value at ***node 2*** (the original value from ***node 3*** given player ***A***'s choice of a tit-for-tat strategy [***2***, ***2***]), or striking out on its own. In this sequential, backwards method the game is regressed, solved to the move by Nature, the chance event that initiated the conflict. This method is adapted to the Thesis Game Tree, and illustrated in the next section.

Note, in the figure the payoff values associated with the two outcomes have been removed for illustration purposes. In every simulation Russia (player ***B***) begins by choosing between $Conflict^{Russia}$ and *NEG* at node 9 (Figure 16). This is the last, bottom-most decision. This is the beginning step in backward induction.

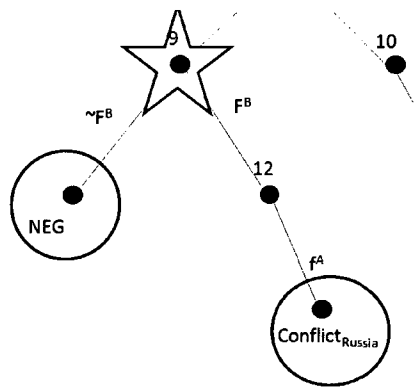

Figure 16. Thesis Game Tree - Russia's choice at node 9
Source: by the author

In the simulations this decision is made by an IF/ELSE statement that compares the generated payoff values associated with these two outcomes. Russia's choice is then held as the value at node 9. In this way the US then compares the value it would receive at node 9, and the value it associates with a $Conflict^{US}$ outcome (Figure 17).

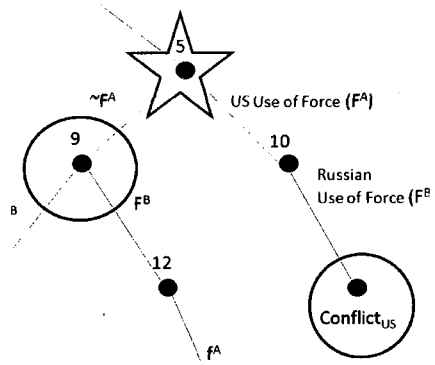

Figure 17. US choice at node 5
Source: by the author

From node 5 the US chooses the greater value, the value at node 9 or the value of $Conflict^{US}$. Recall that each player receives a payoff from every outcome. In making this decision the US is determining if the payoff it will receive given Russia's choice at node 9 (either *NEG* or $Conflict^{Russia}$) is better than its choice to initiate a conflict ($Conflict^{US}$). The same process occurs at node 3. In this way the value of the previous node migrates back up the game tree. Players are choosing between the payoff value they receive at the previous node, and an alternative of their own choosing. At node 1 the US chooses between the value at node 3 or the *SQ* (Figure 18)

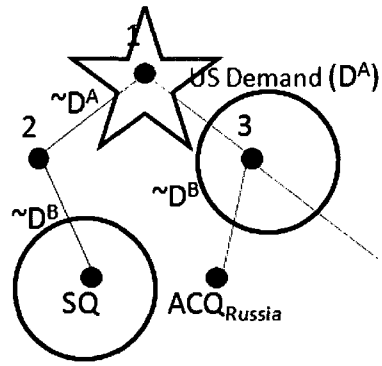

Figure 18. Thesis Game Tree – the US choice at node 1
Source: by the author

In this way the solution to the game is determined at node 1.

What was discussed is a single iteration, or instance of the simulation. This process is automated in the spreadsheet. All of the stochastically simulated games included 30 trials, each containing 30 iterations. The Mean-Value Game was solved once since the payoff values attached to the outcomes were determined and constant. In this instance the payoff values associated with the outcomes were the mean value of the probabilistic ranges. For example, in the Thesis Game Tree Russia's valuation of the *SQ* is expressed as being uniformly distributed in a range between [70, 90]. The mean value of this range is 80. Russia's expected subjective valuation of the *SQ* is 80. Since in this simulation the associated player's specific payoff valuation is a single number this simulation can be solved explicitly. This is done and reported on in section II. A. Before discussing the results some detail specific to the what-if scenarios is necessary.

As mentioned there are two what-if simulations: (1) payoff uncertainty and, (2) increased preference for the *SQ* (by the US). The uncertainty scenario, the first one of the two, models an increase in uncertainty for Russia. This scenario was developed because

there was a concern that a small change in a single payoff for one of the two players might have a significant impact on the outcome of the simulation. The obvious implication of this would be that the model is too sensitive for practical value, unless very detailed data can be used to create the probabilistic payoff ranges. If changing the payoff range from [40, 60] to [30, 60] does not cause significant changes in the aggregated outcome, then the researcher can be confident that a reasonably precise appraisal of player preference values' is appropriate for the model. In this case a significant change is defined as the changing of prevalent outcomes. The *status quo* scenario is an extension on the uncertainty scenario.

The *status quo* scenario addresses the notion that leaders might choose to maintain the *SQ*, postponing a tough decision for someone else. In this scenario the US still holds *NEG* in high regards but is less certain of the payoff (policy results) of a *SQ* outcome. This is reflected by a larger probabilistic range. And, the US is unable to discern the differences in the upper bounds of the two probabilistic payoffs (*SQ* and $Conflict^{US}$). If the President of the US is able to mollify public concerns and present himself as a confident statesman this outcome might be slightly more appealing than a successful military operation. But, a costly conflict is less preferred over an uncomfortable *SQ*. These concepts are modeled by changing the uniform distributions, as perceived by the US to: *SQ* [40, 65] and $Conflict^{US}$ [30, 60].

2. SUMMARY OF THE RESULTS

The results from the Thesis Game Tree simulation will be discussed second (in section II.B) the Mean-Value Game will be next. And, a discussion of the results of the what-if scenarios will conclude this section, and is contained in II.C.

a) The Mean-Value Game

The mean value is the mathematical average of a set of numbers. Specific to a uniform distribution a mean value can be computed using:

$$\frac{1}{2}(a+b) \tag{3}$$

Russia's valuation of $Conflict^{Russia}$ is uniformly distributed in the range [15, 45]. Using equation 3 the mean value for $Conflict^{Russia}$ is [30]. Adapting this to the game tree furthers this research in two ways.

First, the result of the Mean-Value Game provides face validity to the simulation used to execute the Thesis Game Tree. Second, the Mean-Value Game also acts as a base-line for the comparison of the Thesis Game Tree and the two what-if scenarios.

The solution to the game was manually determined and presented in Chapter 3. A mean-value game, a game in which outcome payoffs are set to the mean-value of their probable range should produce a *negotiated* outcome. The simulation did produce a *NEG* outcome (Figure 19).

Vale at Node 9 (for US)	Value at Node 9 (for Russia)	
60	58	NEG
Value at Node 5 (for US)	Value at Node 5 (for Russia)	
60	58	NEG
Value at Node 3 (for US)	Value at Node 3 (for Russia)	
60	58	NEG
Value at Node 1 (for US)	Value at Node 1 (for Russia)	
60	58	NEG

Solution to Game 1
NEG

Russia		
	RAND var.	outcome value
SQ		80
ACQ(Russia)		18
NEG		*58*
Conflict(US)		21
Conflict(Russia)		30

US		
	RAND var.	outcome value
SQ		35
ACQ(Russia)		90
NEG		*60*
Conflict(US)		50
Conflict(Russia)		18

Figure 19. Results from the Mean-Value Game

At node 9 Russia prefers *NEG* to $Conflict^{Russia}$. Later, at node 5 the US prefers the value of the game at node 9 to $Conflict^{US}$. Subsequently, at node 3 Russia prefers the values of the game at node 5 (the value originally from node 9) to the value of ACQ^{Russia}. Finally, at node 1 the US prefers node 3 (the value originally from node 9) to *SQ* (Figure 20).

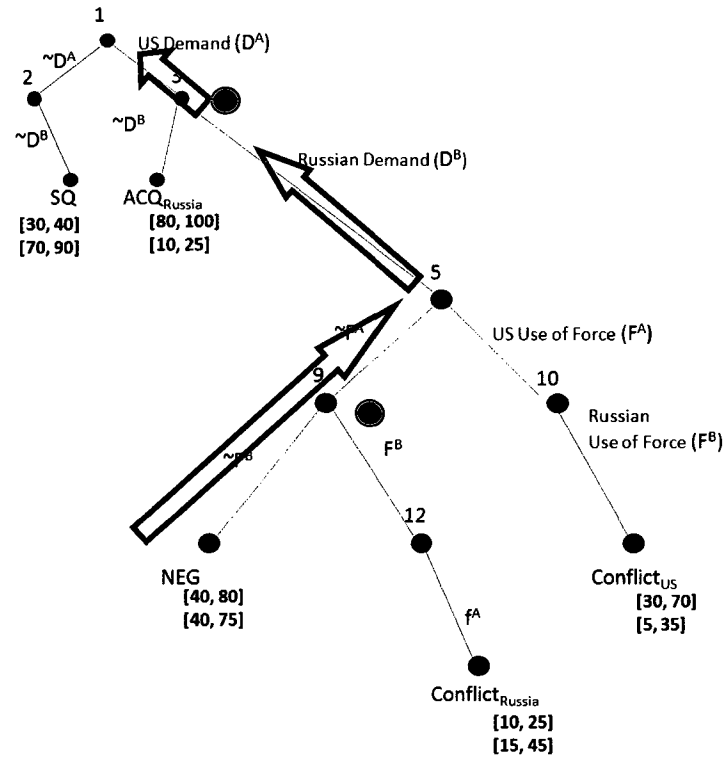

Figure 20. Solving the Mean-value Game
Source: by the author

b) The Thesis Game Tree

The long-run mean value for all 900 samples is shown in Table 1. The mean value is the population mean of the thirty trial means. The complete summary statistics and analysis is provided in section III. The detailed reporting of the data is contained in Appendix A.

Table 1. The Long-run mean (for the three outcomes) of all 30 trials

	NEG	***ACQ[Russia]***	***Conflict[US]***
Probabilistic *Mean*	0.7233	0.1178	0.1589

The Thesis Game Tree simulation depicts a complex sequence of events in which future events are influenced by posterior outcomes wherein all events are based on probabilities. A few issues should be considered.

The most striking observation is that there are no *SQ* outcomes. Neither are there any mixed strategy outcomes. The simulation logic allows for both of these outcomes. Though they are possible mixed strategy and *SQ* outcomes are highly improbable.

A mixed strategy outcome is possible because of the intersection in outcome payoff value ranges. This payoff intersection allows for outcomes of equivalent value; modeling a sort of indecision or complete uncertainty. That is ($NEG = Conflict^{Russia}$) is possible. If this occurred, in the short term, or in a single instance Russia cannot, strictly

speaking, maximize its payoff. There is no way of knowing which decision is better, even after the fact. Over the long-term, however, Russia could use a chance device, flip-a-coin, or choose a 50%/50% strategy, where-in they choose $Conflict^{Russia}$ half of the time, and *NEG* the other half of the time. A mixed strategy outcome was never observed. Figure 21 is illustrative of a single instance of a game. With this as a guide a more detailed discussion of the model, specifically why these two outcomes are improbable (mixed strategy and *SQ*), is provided below.

Figure 21. An instance of the Thesis Game Tree

Consider that Russia chooses between *NEG* [75] and $Conflict^{Russia}$ [value of 45] at node 9. Next, at node 5, the US chooses the value associated with Russia's decision, a *negotiated* settlement [value of 47] ($NEG > Conflict^{Russia}$) or the value of $Conflict^{US}$ [value of 63]. This rolls the game back to node 3. At node 3 Russia prefers a US initiated conflict [value of 19] to its own acquiescence [value of 14]. Finally, at node 1 the US compares the maintenance of the *SQ* [value of 34] to a US initiated *conflict* [value of 63]. The outcome solution to the game is a conflict begun by the US. For a mixed strategy outcome to occur both of the following conditions must be met:

(1) Russia's value for *NEG* **AND** $Conflict^{Russia}$ must be equivalent, and between 40 and 45 utils ($NEG \bullet Conflict^{Russia} = [40, 45] \rightarrow$ ValueNode9). The equivalency value would be stored in node 9 (ValueNode9).

(2) The US valuation of $Conflict^{US}$ must equal the payoff value it would receive at node 9 ($Conflict^{US}$ = ValueNode9)

Since all of the outcome events are independent of one another (the values are all instantiated simultaneously) the joint probability can be calculated as:

(3)

A: $Conflict^{Russia}$ = 40 utils (given range is uniformly distributed in [15, 45].

P(A) = (1/30) = (0.033)

B: *NEG* = 40 utils (given range is uniformly distributed in [40, 75]).

P(B) = (1/35) = (0.0029)

The $P(A \cap B) = P(A)P(B) = (0.033)(0.029) = (0.00096) = P(C)$

The value for P(C) is associated with [40]. We need to account for [41, 45] so-

(0.00096)(5) = 0.0048 or approximately 0.5%

(4) Now consider the probability that the US valuation of $Conflict^{US}$ will = 40.

D: $Conflict^{US}$ = 40 utils (given range is uniformly distributed in [30, 70].

P(D) = (1/40) = (0.025) or 2.5%.

The probability that Russia's assessment of $Conflict^{Russia}$ and *NEG* = [value of 40] (from node 9); and that the US's valuation of $Conflict^{US}$ = [value of 40] (from node 5) is equal to (0.00096)*(0.025) = 0.000024 or 0.0024%. This only accounts for the single value, "40". Other points of intersection within the three subsets were not included in

this example. This illustration is meant to show the improbable nature of a mixed strategy outcome. A mixed strategy outcome seems to be improbable. A similar analytical method shows that a SQ outcome is even less probable given the US valuation of *SQ*.

c) "What-if" games

The first game explores the concept of uncertainty in decision-making. In this scenario the Russian valuation of a ACQ^{Russia} is less certain; but, it is more favorable than previously, now the range is set to [10, 35] (from [10, 25]). In the model this means that it is difficult for Russia to distinguish the difference between their payoff from a "good" $Conflict^{US}$ or a "good" ACQ^{Russia}. The maximum payoff value associated with these two outcomes, from the Russian perspective, is [value of 35]. Conversely, in this scenario US uncertainty is decreased. This equates to a change in the US's valuation of $Conflict^{US}$ (to [30, 60] from [30, 70]). This experiment included 30 trials. Each trial included 30 iterations. The results are provided in Table 2. The mean value is the mean of the thirty trial means.

Table 2. What-if: Uncertainty the population mean of all 30 trials

Outcome	Probabilistic Mean Value
NEG	.812
ACQ(Russia)	.129
Conflict(US)	.059

It was expected that manipulating the payoff ranges would directly affect the outcome. The analysis of the results produces two revelations, first, the mean value for *negotiation* increased by almost 9%, from 72% to 81%. The frequency of Russian *acquiescence* changes slightly; but, the US initiated conflict outcome frequency is more than cut in half (from 16% to 6%). Second, an increase in uncertainty in the simulation, modeled by larger payoff probability ranges, was expected to cause an equal skewing in the outcome standard deviation. This was not the case.

The range of payoff values for $Conflict^{US}$ (as seen by the US) was reduced from [30, 70] to [30, 60]. The range of payoff values for ACQ^{Russia} (as seen by Russia) was increased from [10, 25] to [10, 35]. In both instances the standard deviation did increase slightly. There is a direct correlation between Russia's perception of the value of ACQ^{Russia} and an increase in the standard deviation associated with the frequency of ACQ^{Russia}. It would seem that the less certain a player is of an outcome the less likely they are to make decisions leading to that outcome. The frequency of ACQ^{Russia} increased slightly from an average of [3.87] (in a trial of 30) in the Thesis Game Tree to [3.53] in the uncertainty scenario.

Regarding $Conflict^{US}$, the frequency with which a conflict outcome was produced, and the standard deviation across the 30 trials both decreased. The standard deviation specific to conflict for the 30 trials decreased from [2.21] to [1.41]. More noticeable is the decrease in the frequency with which conflict occurred. It decreased from a value of [4.77] to a value of [1.77] (in an average trial of 30 iterations). It can be argued that a player might make a choice based on the possibility of a higher payoff, even if it is less

probable. The standard deviation statistics comparing the Thesis Game Tree simulation to the What-if: uncertainty scenarios are reported in Table 3.

Table 3. Standard deviations for the uncertainty scenario

	ACQ(Russia)	*Conflict(US)*	*NEG*
Standard Deviation (Thesis Game Tree)	1.78	2.21	2.76
Standard Deviation ("What-if": uncertainty)	1.81	1.41	2.16

Applying these decisions to the game tree, and examining them from a practical, policy viewpoint highlights the following: at node 9 there is no change between Russia's probabilistic valuation of either *NEG* or $Conflict^{Russia}$. However, at node 5 the US's valuation of a US initiated conflict is reduced. But, the US will always choose to attack over being attacked. The decreased valuation of $Conflict^{US}$ means that there should be more instances in which the US chooses to *negotiate*. These two considerations explain why there are more *NEG* outcomes. Specifically, a NEG settlement is probabilistically well regarded by both player; and, the US's valuation of $Conflict^{US}$ has decreased. To understand why the number of ACQ^{Russia} change only slightly we must again consider the change in the value of $Conflict^{US}$. The US values conflict less than it did before. Then, there will be more instances in which the US chooses to negotiate because the intersection in the area under the US's two distribution curves, (*NEG* and $Conflict^{US}$) has

decreased by one-third. Or, conversely, Russia's offer of *NEG* looks better by thirty-percent.

The second and final what-if scenario examines the maintenance of the *status quo*. In this scenario the changes made in the previous scenario are maintained, namely, an increase in Russian uncertainty regarding ACQ^{Russia}, and a decrease in US uncertainty and valuation of $Conflict^{US}$. In addition, the *status quo* payoff as viewed by the US was changed to [40, 65]. The inspiration behind this scenario was the idea that whatever event might have caused the US to adjust its preference range for $Conflict^{US}$ could affect its valuation of the *SQ* as well. Effectively a conflict is no longer as pleasing as it might have otherwise been; thus the status quo looks just a little better than it did before. These modifications produced a statistically significant number of *SQ* outcomes (Table 4).

The maintenance of the *status quo* now makes up 22% of the outcomes. What is interesting is that the US probabilistic valuation for *SQ* [40, 65] is comparably similar to [30, 60] for $Conflict^{US}$. Even given significant intersection within the two payoff ranges $Conflict^{US}$ only accounted for 3% of the total outcomes. This highlights that maintaining the *SQ* need not be probabilistically much preferred over other outcomes.

Table 4. "What-if": *status quo* the long-run probabilistic mean of the outcomes for all 30 trials

Outcome	Probabilistic Mean Value
NEG	.633
ACQ(Russia)	.113
Conflict(US)	.032
SQ	.221

This chapter concludes with a few points regarding policy as it pertains to the outcomes of the four games presented in this thesis. Specifically, it includes a discussion on the relationship between the Thesis Game Tree and the two what-if scenarios. Finally, section 3. will also include additional statistical tests pertinent to the reliability of the model.

3. INTERPRETATION AND POLICY ANALYSIS

Common statistical test data is reported and interpreted in section 3a. Section 3b. takes this data and applies it qualitatively to Game Theory policy, the effect on political policy formulation is covered in the final chapter. That is, how the game should be played (Game Theory policy) versus how political policies might be crafted (political policy) based on the information input into the model.

a) Statistical testing and interpretation

The statistics tests conducted for this thesis involves the Thesis Game Tree. This seemed appropriate as the two what-if scenarios were adaptation of the aforementioned model. Table 5 provides common statistical data regarding the Thesis Game Tree.

Table 5. Common statistical data for the Thesis Game Tree

	NEG	***CONF***	***ACQ***
Frequency Mean	21.70	3.53	4.77
Standard Deviation	2.76	1.78	2.21
Confidence Interval Range	[21.67, 21.73]	[3.50, 3.55]	[4.74, 4.80]

Assuming normality, the confidence interval range is associated with a 95% confidence interval. In 95 out of 100 sample trials we should get a frequency mean, for *NEG,* between 21.67 and 21.73. In a sufficiently large sampling of IID trials, with each trial containing 30 iterations, a two-thirds majority of the outcomes should be *NEG.* Previously probabilistic mean values have been reported. Here (Table 5) the mean values are associated with the population frequency of an outcome in a 30 iteration trial, as opposed to the probabilistic likelihood of observing a specific outcome.

The outcome data pertaining to the occurrence of a *NEG* settlement for the Thesis Game Tree when fit to a distribution fits to a Normal distribution (Figure 23). Increasing the number of trials might reveal a bimodal Normal distribution. There were 30% more $Conflict^{US}$ outcomes than ACQ^{Russia} in the Thesis Game Tree. However, this could also be a chance outcome that is neither sustained in larger experiments, nor repeatable.

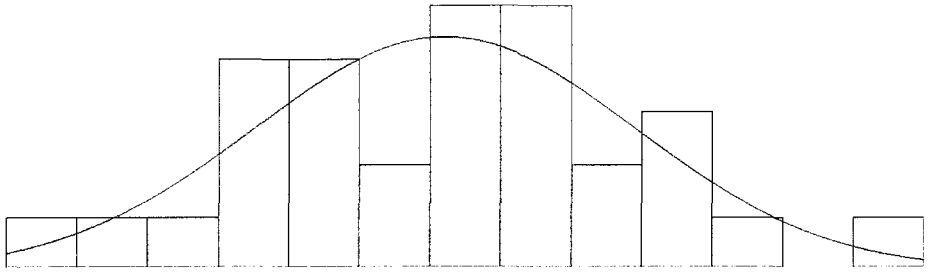

Figure 22. Frequency of *NEG* fit to a distribution curve
Source: by the author, using Arena's Input Analyzer

The Chi-square p-value is 0.336. Since the p-value is greater than 0.05 the results of the simulation can be ascribed to chance. In this instance the structure of the game drives decision-making. The model does not contain a biased component that could influence the simulation output. The implication of this is that the Normal distribution could be used to approximate the results of this model. These tests and the histogram were conducted using Arena's Input Analyzer.

b) Policy analysis and possible strategy implications

The four simulations were discussed in this chapter: 1) the Thesis Game Tree; 2) the Mean-Value Game; 3) "What-if": uncertainty and; 4) "What-if": s*tatus quo*. Three policy conclusions are drawn from these three outcomes.

First, simply changing a payoff value for a single player will not necessarily change the outcome of a probabilistic game. This was not unexpected. The author understood the complex nature of the simulations but, was surprised by the results obtained in the "What-if": s*tatus quo* simulation. Moving the lower-boundary slightly while increasing the upper-boundary had a large, noticeable effect in the occurrence of a *SQ* outcome. This is instructive. Such modifications could be modeled as a side-

agreement, or possibly a threat. If new information were brought into the simulation at every node, a re-evaluation of payoff values would be required. This re-evaluation would affect the outcome of the game. In this instance only US values regarding the maintenance of the *SQ* were manipulated. This illuminates the importance of the second player (here a nation) in conflict decision-making.

Second, the "other" player makes difference in the outcome. Though the US probabilistically prefers *SQ* to $Conflict^{US}$ there was still conflict in the "What-if" - *status quo* scenario. Additionally, from the US perspective the mean value associated with *NEG* was [60] while the mean value for *SQ* was [53] with ranges [40, 80] and [40, 65] respectively. This was capable of producing numerous *SQ* outcomes, 22% in the experiment aggregate. Examine any game tree used in this thesis and consider an instance of the What-if: *SQ* game. In this game it is possible that Russia could prefer $Conflict^{Russia}$ and the US prefer $Conflict^{US}$ to a *negotiation* but the solution of the game could end up being the maintenance of the *status quo*. This is a form of the classic Hawk-Dove Game. In this thesis version of the game an unpopular *SQ* is perceived as favorable to losing in a *NEG* or risking a conflict. The third and final point deals with the Mean-Value game.

Randomness is an important aspect of modeling and simulation. This thesis has reinforced this by discounting the deterministic outcome of the Mean-Value Game when compared to the thirty trials from the Thesis Game Tree. The Thesis Game Tree model was created with probabilistic payoff values to denote decision-maker uncertainty. A national leader can reasonably expect the payoff of his decision to fall within certain

boundaries as defined by a lower and upper boundary. They cannot precisely define the value of an outcome. Simply using the mean value of these payoff ranges would not be appropriate in many instances for reasons similar to those which govern the inappropriateness of using mean values in a queuing model. Put another way, using the mean value is appropriate in some instances as per the law of large numbers (LLN). It is not appropriate in others. In a single or small number of instances (or samples) the law (LLN) does not apply. Since decisions are made once applying the LLN, hence mean-values, to decision-making could produce unpleasant consequences. While aleatory uncertainty cannot be reduced epistemic uncertainty can. What does this mean for decision-makers in the complex environment? Decision-makers could look to further develop the problem and gather more information about the context as opposed to manipulating a model and attempting to "find the solution". For example, a reassessment of the decisions risks could change payoff values by lowering costs or raising payoffs. This new knowledge, revealed by changes in probabilistic payoff rangers would change the solution to the game.

CHAPTER FIVE

CONCLUSIONS

1. CHECHNYA AS AN ISLAMIST SAFE HAVEN

Islamists need a new safe haven. Military operations in Marja, Afghanistan during April 2010 are disrupting the last Islamist safe haven in Afghanistan. Meanwhile, Pakistan continues to fight militant Islam within its own borders. The US, NATO and their regional partner Pakistan, have made steady progress towards the achievement of their political, tactical and strategic goals over the last six months.

Chechnya is a suitable location for an Islamist safe haven. Like Afghanistan Chechnya is predominantly Sunni Muslim and, it has been devastated by years of conflict. Though the people of Chechnya are of a different ethnic background the author contends that this is a minor impediment. As noted in Chapter 2 there are historical, political ties between Chechen rebel organizations and the Afghani Taliban. Similarly, notable Chechens, including the Second President of the Chechen Republic of Ichkeria maintained a supportive relationship with al Qaeda in the early 1990s. The author contends that general Chechen population would aid, or ignore the actions of fellow Muslims in Chechnya, as opposed to disrupting their operations for the sake of the US. Another consideration is that Chechnya is in the Russian sphere of influence.

Any action taken against Chechen Islamists by the US or NATO comes with the realization that Chechnya: 1) is strategically located on Russia's border and; 2) a former oblast of the USSR. Chechnya's capital, Grozny is near Volgograd; current day Chechnya is literally on Russia's vulnerable southern border. Many of Russia's

metropolises are north-west of Volgograd, including Moscow. An American military force in Chechnya would seem to be an unacceptable risk for Russia. American money and American culture come with American soldiers. These political considerations affect the decision calculus in Russia and the US. For the US these considerations drive up the cost of what could already be a costly military operation. For Russia militant Islam in Chechnya has been the norm for almost two-hundred years. US protestations regarding a Chechen safe haven would fall on deaf-ears; the US was a vocal critic of Russia during both of its wars (with Islamic militants) in Chechnya.

Under certain conditions and given specific policy objectives, it would be reasonable to assert that Russia might gain by allowing the creation of an Islamist safe haven in Chechnya. Russia has regional military and political concerns, namely China. But, the US is Russia's contemporary rival. It has been argued that a US administration harried by Islamists, and concerned with Iran is a US that is less likely to devise anti-Russian policies [1]. Given assurances to Russia, an Islamist safe haven in Chechnya could, in effect diminish US power. This seems like a risky gambit. But, as mentioned in Chapter 2 there are credible reports indicating that prominent Russian officials knew of, and tacitly approved of, the invasion of Dagestan by Shamil Baseyev [2]. It was believed that a small conflict would steel Russian domestic political support behind Yeltsin; it would provide a political gain. This adds credibility to the aforementioned notion of a Russian backed Islamists safe haven in Chechnya.

Finally, political and economic conditions in Chechnya, the author contends, are only stable in appearance. Russia is rebuilding Chechnya. Chechnya does not appear to

be capable of rebuilding itself. It is uncertain what Chechnya could do by itself given the devastation of its infrastructure. As for the current President of Chechnya, some Chechens see a correlation between president Kadyrov and improving conditions in Chechnya [3]. On the other hand, others see no progress. Kadyrov is popular with some; they see him as a problem solver. The opposite is also true. Many simply fear him.

What would happen if Russia were unable, or unwilling, to continue funding efforts to rebuild Chechnya? Russia's economy is hitched to its energy reserves, specifically oil and natural gas. Global oil prices have been relatively flat since the heights of the summer of 2008. Russia's economy is expected to continue to shrink [4]; and, Putin is becoming more unpopular. Could Kadyrov be replaced by an Islamist government? If so what would happen? An analysis of the literature, as presented in Chapter 2, indicates that the Kadyrovsky's which have been so important to Kadyrov's survival could be the instrument of his removal. This could provide Russia a reason to suspend rebuilding operations. And, it could also keep the US on edge for awhile longer. Likewise, weaker Caucasus states might be willing to accept Russian security assistance, strengthening Russia's role in the Caucasus as a whole. In short, Russia could get a weapon and trans-national Isalmists could get a shield. In short, at face-value it might seem unlikely that Russia and Chechnya would allow trans-national Islamists a safe-haven in Chechnya. However, a deeper analysis reveals that though unlikely, there are numerous reasons why Islamists could relocate to Chechnya. Given this supposition the model and simulation provide future policy outcomes when given a range of outcome preferences for the US and Russia.

2. THE MODEL AND THE METHODOLOGY

The author's analysis is used to develop probabilistic preference ranges for a Game Theory model. The author's work follows work done by Bueno de Mesquita in *War and Reason.* The US and Russia are in a state of political conflict. Each nation is attempting to maintain their national security policy regarding: (1) Islamists and (2) Chechnya.

The probabilistic payoff preferences mimic natural decision-making. The US would prefer that Russia give in to its demands. For its own reasons' Russia would prefer not to. From the US perspective a 'bad' negotiation can be worse than a 'good' conflict. But, both of these outcomes are strictly preferred to the *status quo*. In Game Theory strictly preferred outcomes are removed. Alternative outcomes in the game dominate the inferior outcomes. Dominated outcomes are not pursued in a game with full information and rational players.

Specific to payoff preferences, Russia views things differently than the US. The *status quo* is good for Russia. In April 2009 Russia ceased military operations in Chechnya after fifteen years of armed, military conflict. Russia is beginning to regain a position of global influence, a portion of its former strength. Thus, giving in to US demands rates poorly as it would diminish the perception of Russian power. It is the author's assessment that a conflict with the US would be costly for both nations; but, a conventional armed conflict between Russia and the US could be the end of Russia. But, a limited conflict waged by a Russian proxy, Chechen Islamists, could sap American power. This is especially true if the Islamists could affect US interests outside of the

Caucasus; and, if the US can be kept outside of the Caucasus. This conflicted decision-making is modeled well by Game Theory.

Game Theory illuminates why decision-makers arrive at what appear to be suboptimal outcomes. The decision-makers seek to maximize their own subjective expected utility but, they are thwarted by their opponent who is attempting to do likewise. The *status quo* game is an example of such a situation. Both nations could prefer to initiate a *conflict* and, neither wants to *negotiate*. In this instance the structure of the game could produce a *status quo* outcome. Applying this to the literature, in effect the US knows that Russia would rather initiate a conflict than enter into what it expects could be a contentious *negotiation*. The US feels the same way. The US also knew that Russian *acquiescence* is an unreasonable expectation. Thus, if the US issues a demand Russia would follow, in which case the US would have to initiate a *conflict* ahead of Russia. Fearing a costly conflict the US chose to maintain the *status quo*. The Thesis Game Tree offers a different scenario. Two-thirds of the outcomes in the Thesis Game Tree were *NEG*. In these would-be futures neither country desires a conflict.

3. LOGICAL VALIDITY OF THE MODEL

The complex adaptive nature of this modeling approach creates combinatorial complexity, making the problem computationally intractable. Simulation can be used to address this problem.

Much of the complexity in the model exists because of the second player. The model and the simulation illustrate the important role that the second player has in decision-making. In the Thesis Game Tree model a host of probabilities affect every

player's decision. Plainly, players are making decisions in uncertain conditions. Neither player can fix a value to any of the outcomes for themselves or their opponent. They only have a notion of what they and their opponent prefer in broad terms.

The Thesis Game Tree was solved manually using mean values for the player's outcome payoff values. This produced a *negotiated* settlement. Later, this scenario was created in an Excel spreadsheet based Monte Carlo simulation. Using the exact same values the simulation produced a *negotiated* settlement. This test validated the IF/ELSE logic used in the spreadsheet to produce a solution to the game through backward induction. The Thesis Game Tree was then engaged through simulation, and 900 outcome results were returned within 30 trials. Each trial contained 30 instances of the model. A *negotiated* settlement accounted for 72% of the outcomes. A *conflict* initiated by the US accounted for 16% of the outcomes. Russian *acquiescence* accounted for the rest (12%). Statistical tests verified that these results were robust. A 95% confidence interval range indicated that more than 21 of the 30 outcomes in a given trial (30 iterations per trial) should be *negotiated* settlements.

Finally, the "what-if" scenarios presented in Chapter 4 demonstrated the flexibility and descriptive capabilities of this model and its methodology. The author affirms that Game Theory, the International Interaction game in general, and the Thesis Game Tree in specific can be useful heuristic decision analysis tools. Their structure provides enough rigor to prevent recurrent logical errors without requiring extensive specialized education or analytical tools. Their mathematical foundation allow for

quantitative comparisons and analysis that are intuitive and repeatable. This study also highlights the role of uncertainty in decision making.

Uncertainty plays a role in conflict. To be human is to error. From the author's perspective determinism in decision support is a questionable proposition. Rational, powerful decision-makers at the pinnacle of their profession and, in the greatest states of their generation are often confronted by the unknown. The application of probability to these models increases their usefulness because it increases their acceptability.

Finally, this research provides a template for the application of probability based Game Theory studies in the social sciences. The research offers a methodology for combining qualitative analysis with quantitative models and methods. The research provides a method through which the problem statement or research question is bounded within the body of qualitative literature. Later, with the refined research question in-hand the quantitative model can be developed and simulated using a number of methods and tools.

4. RECOMMENDATIONS FOR FUTURE STUDY

This section is divided into two categories, (a.) recommendations for improvement on the model, and (b.) possible application.

a) Recommendations for improvement

Two obvious recommendations involve the payoff ranges. First, the payoff ranges are derived by the author from the qualitative literature. These value ranges are the result of the author's analysis, experience and knowledge. The quantitative data does

not exist. It is likely to never exist; every game or application of the model is likely to have its own unique context, constraints, and players. All three of these parameters impact on the structure of the model, the preferential ordering of probabilistic outcomes, and the value ranges associated with probabilistic outcomes. Consider that the methodology in this thesis could be applied to other decision-making instances. The model and methodology contained in this thesis could be used to model decision-making in a political conflict between South Korea and Japan, or Brazil and Venezuela. In every instance the payoff values attached to the underlying structure of the game would have to be derived at the moment. Second, not obvious from this research, is the lack of a third player or an external agent.

In Game Theory payoff values express all of the associated gains and costs of decision-making. Since payoff values are attached to the end game it is difficult to update decisions. Conflicts between two nations generally affect other nations; they are stakeholders in the outcome. From a practical stand point their influence on the players should be modeled somehow. With Game Theory this is a difficult task. In the Chechnya scenario contained in the thesis, the US decisions to continually escalate to $Conflict^{US}$ might be more infrequent if the US had to deal with a similar escalation of international political rhetoric. Generally these considerations are modeled implicitly. Payoffs are said to encompass everything, all costs and all gains. This does not seem adequate given the action, reaction, counter-action paradigm in international relations.

Third and finally, this model suffers because it does not explicitly allow for decision updating. While uncertainty, depicted by probabilistic outcome payoffs, can

implicitly model decision updating it is inadequate in application. The usefulness of the model and its simulation methodology are limited by three points:

1) derivation and assignment of outcome payoff ranges

2) inability to account for "additional players"

3) the lack of decision-updating.

b) Areas for possible application

The author believes the strength of this model and its simulation lies in its simplicity, flexibility and illustrative nature.

An individual with minimal understanding of Game Theory could determine their own problem statement, conduct their own analysis, build a similar model, remove dominated branches (outcomes), engage a simulation, and produce meaningful results. In this instance, this thesis has elucidated the strengths of the International Interaction Game. These models (International Interaction Game and the Thesis Game Tree) and can be applied to almost any conflict. With some modification these models could be used in *n-person* games. This could be accomplished through coalition forming, or simply by modeling the actions of major players within a system and disregarding other players. Presumably minor players in the anarchic international system will coalesce around power players be it a bi-polar or multi-polar system. This argument is made by Organski and Kugler in *The War Ledger* [5]. Bueno de Mesquita created a similar model for policy formulation and implementation within *European Community Decision Making* [6].

The methodology illustrates the complex nature of decision-making when the two players are in conflict. But, it hints are solutions to the problem. I can be used to explain why suboptimal decisions are reached by competing parties and, why in some instances the result is not only suboptimal but surprising.

Notes

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APPENDIX A

Frequency / Trial	NEG	ACQ[Russia]	Conflict[US]
1	19	5	6
2	26	2	2
3	19	4	7
4	17	7	6
5	20	2	8
6	20	5	5
7	22	1	7
8	23	5	2
9	24	2	4
10	25	4	1
11	21	3	6
12	20	6	4
13	19	4	7
14	23	4	3
15	22	2	6
16	28	1	1
17	18	7	5
18	16	4	10
19	19	5	6
20	25	1	4
21	21	5	4
22	23	4	3
23	22	2	6
24	22	6	2
25	23	3	4
26	23	1	6
27	22	2	6
28	20	3	7
29	25	2	3
30	24	4	2

Outcome Percentages		
0.63	0.17	0.20
0.87	0.07	0.07
0.63	0.13	0.23
0.57	0.23	0.20
0.67	0.07	0.27
0.67	0.17	0.17
0.73	0.03	0.23
0.77	0.17	0.07
0.80	0.07	0.13
0.83	0.13	0.03
0.70	0.10	0.20
0.67	0.20	0.13
0.63	0.13	0.23
0.77	0.13	0.10
0.73	0.07	0.20
0.93	0.03	0.03
0.60	0.23	0.17
0.53	0.13	0.33
0.63	0.17	0.20
0.83	0.03	0.13
0.70	0.17	0.13
0.77	0.13	0.10
0.73	0.07	0.20
0.73	0.20	0.07
0.77	0.10	0.13
0.77	0.03	0.20
0.73	0.07	0.20
0.67	0.10	0.23
0.83	0.07	0.10
0.80	0.13	0.07

Average	21.70	3.53	4.77
Std Deviation	2.76	1.78	2.21
Variance	7.60	3.15	4.87
CI	0.03	0.02	0.03

NEG	ACQ[Russia]	Conflict[US]
0.7233	0.1178	0.1589
0.0919	0.0592	0.0736
0.0084	0.0035	0.0054
0.0011	0.0007	0.0008

Lower Bound	21.67
Upper Bound	21.73

Lower Bound	0.7223
Upper Bound	0.7244

Trials 1 to 30 listed on the left side of the spreadsheet. Trial 1 (recall there were 30 iterations per trial) contained 19 *NEG*, 5 ACQ^{Russia} and 6 $Conflict^{US}$ outcomes. *Negotiation* resulted in 63% (0.63) of all outcomes within Trial 1. On average there were

21.70 *NEG* (total population mean) outcomes out of 30. The 95% Confidence Interval range is [21.67, 21.73].

VITA

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