2024

The Russian Orthodox Church and Russia's Military Nuclear Complex: A Time Series Analysis

Myla Burton
myla.burton@siu.edu

THE RUSSIAN ORTHODOX CHURCH AND RUSSIA'S MILITARY NUCLEAR COMPLEX: A TIME SERIES ANALYSIS

by

Myla J. Burton

B.A., Southern Illinois University Carbondale, 2019
J.D., Southern Illinois University School of Law, 2022

A Research Paper
Submitted in Partial Fulfillment of the Requirements for the
Master of Arts

School of Anthropology, Political Science, and Sociology
in the Graduate School
Southern Illinois University Carbondale
August 2024

RESEARCH PAPER APPROVAL

THE RUSSIAN ORTHODOX CHURCH AND RUSSIA'S MILITARY NUCLEAR COMPLEX: A TIME SERIES ANALYSIS

by

Myla J. Burton

A Research Paper Submitted in Partial

Fulfillment of the Requirements

for the Degree of

Master of Arts

in the field of Political Science

Approved by:

Dr. Joseph T. Grant, Chair

Dr. Benjamin Bricker

Graduate School
Southern Illinois University Carbondale
July 3, 2024

AN ABSTRACT OF THE RESEARCH PAPER OF

Myla J. Burton, for the Master of Arts degree in Political Science, presented on July 3, 2024, at Southern Illinois University Carbondale.

TITLE: THE RUSSIAN ORTHODOX CHURCH AND RUSSIA'S MILITARY NUCLEAR COMPLEX: A TIME SERIES ANALYSIS

MAJOR PROFESSOR: Dr. Joseph T. Grant

In recent years, the relationship between the Russian Orthodox Church and the Russian military has garnered significant scholarly attention. Notable contributions from Adamsky (2019) and the Garrards (2008) assert the integral nature of this relationship. This research paper builds on this research by examining the relationship between the level of Orthodox religiosity in the Russian public and the Russian nuclear complex. This research provides a foundational step towards a deeper understanding of the Russian Orthodox Church's navigation within Russia's religious market. The primary objective is to better understand the connection between the Russian Orthodox Church and Russia's military-nuclear complex. The research paper begins with an overview of Russia's religious market and a review of the extant literature on the church-state relationship in Russia. This literature offers several hypotheses for the relationship between the public's involvement and support for the Russian Orthodox Church and Russia's military, specifically its nuclear program. I test between these hypotheses using a novel measure of Orthodox religiosity. I employ time series analysis to investigate the existence of a cointegrated relationship between this measure and Russia's nuclear-military complex. I find evidence of a cointegration, which suggests that levels of Orthodox beliefs and practices move through time with changes in the military. Further analysis using error correction models reveals that this relationship is not causal. This indicates an underlying process influencing both series. The study concludes with a discussion of the implications and final remarks.

ACKNOWLEDGMENTS

I would like to express my deepest appreciation to the professors on my committee, Dr. Grant and Dr. Bricker. Both professors have been integral parts of my academic journey. Dr. Bricker helped me to find my passion for Political Science back when I was just an undergraduate student. Through Dr. Grant's guidance, I found my love for econometric methods and interdisciplinary work. I would not be the scholar I am today without either of them. I am eternally grateful.

I would also like to thank the faculty and participants at the Association for the Study of Religion, Economics, and Culture June 2024 Graduate Workshop. I am especially grateful to Larry Iannaccone, Carolyn Warner, and Darren Sherkat for their comments on the working version of this research paper.

DEDICATION

I would like to dedicate this work to my parents, Terry and Deb Burton. Their unwavering encouragement and support have guided me throughout my life and my academic journey. From a young age, they nurtured my love for reading. This love for reading laid the foundation for my future pursuits of knowledge and education. I owe them everything.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

This research paper broadly looks at the issues surrounding church and the state. What is the relationship between church and state like? This has been addressed by many scholars including Adam Smith, who argues that when the relationship between church and state is too close, monopolized religion can occur and can become very problematic (Smith, [1759], 2009). More specifically, this research paper looks at the relationship between a public religion and a state's military institutions. Scholars such as Ron Hassner (2014) have contributed to these topics, asking questions about how religions are influencing a state's military. Using Russia as a key case, this research paper specifically looks at how the Russian public perceives the relationship between the Russian Orthodox Church and Russia's nuclear-military complex.

In *Russian Nuclear Orthodoxy*, Adamsky (2019) traces the relationship between the Russian Orthodox Church (ROC) and the Russian nuclear-military complex across three decades post-dissolution. He finds that both institutions have become quite intertwined with each other, mostly thanks to the Russian Orthodox Church's attempts to saturate themselves within the nuclear-military complex. Adamsky (2019) identifies this saturation as a strategic attempt from the ROC to carve out a place for themselves within Russian politics. He shows that as a result, the ROC has become deeply involved in the Russian political landscape and continues to become even more involved. He argues that this involvement pushes Russia closer to becoming a military theocracy. According to Adamsky (2019), there are three ideal types describing the nexus between state military and religions: (1) where the military allows individuals within service to practice personal religious beliefs, (2) where religion has become intertwined with national ideologies in a form of patriotism, and (3) where religion in determining strategic

military decisions and how the military operates as a whole (military theocracy). Adamsky (2019) suggests that at the time he wrote the book, Russia could be classified in the second category and potentially in the early stages of the third category.

As discussed in the following section, market theory views religion as a sector of the economy that interacts with the state just like other sectors. Religions will seek deregulation (more religious liberty) or lobby the state to exclude competitors (less freedom) depending on their place in the market (Gill, 2007). This research paper reinterprets Adamsky's (2019) arguments by using market theory. When applying market theory to Adamsky's (2019) three ideal types, a spectrum of competition and regulation can be mapped out. In the first ideal type, those who are in military service can practice individual religion freely. This is true for all denominations (Adamsky, 2019). These characteristics suggests that the religious market in the state is highly competitive. In the second ideal type Adamsky (2019) identifies, religion becomes intertwined with national identity and patriotism in the service. Here, a dominant religion rises to secure this role (Adamsky, 2019). This would suggest a less competitive religious market – where a dominant religion is using their relationship with a state institution for leverage in the religious market. The third ideal type shows the smallest evidence of competition in the religious market (Adamsky, 2019). In this type, military has saturated the military and the actors within it. This would suggest the existence of some kind of state or public religion. Adamsky (2019) suggests that at the time he wrote the book, Russia could be classified in the second category and potentially in the early stages of the third category. When applying the market theory spectrum, this would imply that Russian Orthodoxy was a national religion in a less competitive market that has become intertwined with national identity and patriotism. It also implies that Russian Orthodoxy is moving towards the third ideal which is a heavily regulated market with a state or

public religion (Adamsky, 2019). While addressing several different literatures in the book such as international relations, security studies, studies of military and religion, Adamsky (2019) does not mention the economics of religion. This theory builds upon Adamsky's work by reinterpreting his theory to apply market theory.

Background: The Russian Orthodox Church in Russia's Religious Market

When applying the religious market theory to Russia, the dangers of regulation become apparent. Russian Orthodoxy holds many privileges in the Russian state; however, it does not officially hold a complete monopoly over the state's religious market (Adamsky 2019, Garrard and Garrard, 2008). Competition in the market does exist somewhat through the legal existence of religions such as Judaism, Islam, and Catholicism in the state. Regardless, true competition is severely limited through the massive privileges that Russian Orthodoxy holds thanks to the Russian state (positive regulation of the religious market) (Adamsky, 2019; Garrard and Garrard, 2008). For example, the state has restituted former ROC property and has increased the ROC's presence in schools and domestic/foreign policy discussions (Adamsky, 2019: 234). However, competition is also limited through negative regulations imposed on the market by the Russian state (Adamsky, 2019). For example, Russia has increased the burden of practicing other religious by creating legal barriers. The United States Department of State has classified these religious regulations in the Russian religious market into four types: ". . . registration of religious organizations' access to places of worship (including access to land and building permits); visas for foreign religious personnel; and government raids on religious organizations and detentions of individuals" (2007:1). Therefore, the market cannot be described as truly competitive. This supports Adamsky's (2019) claims that the relationship between religion and military in Russia is somewhere between the second and third ideal type – between somewhat regulated and

heavily regulated.

However, this is not what Russia's religious market has always looked like since the dissolution of the Soviet Union. Upon *glasnost*, Russia's religious market was flooded with competition (Adamsky, 2019; Gill, 2007). As Ahdar (2006) correctly describes, "Deregulation 'opens the floodgates of innovation' (Iannaccone, 1988; Finke & Starke, 1997: 358) enabling a plethora of willing religious suppliers to meet what, hitherto, has been an inadequately satisfied consumer demand for religious goods" (58). And this is exactly what happened in Russia thanks to the 1990 law on Freedom of Conscience which opened re-opened the religious market in Russia (Adamsky, 2019). Just as the Russian Orthodox Church benefitted from *glasnost,* so did other religions who resurfaced to take advantage of deregulation. These ranged from missionaries from the Assembly of God to Hare Krishna monks. The presence of these religions now introduced a huge potential problem for Russian Orthodoxy (or, what they viewed as a problem) – religious competition (Garrard and Garrard, 2008).

Due to the increase in religious competition, in the early 1990s, the Russian Orthodox Church participated in a bottom-up approach to gaining followers – focusing on converting members of the military (a state institution) while also trying to gain influence in the state through their ties to Russian identity (Adamsky, 2019). The Russian Orthodox Church did not have strong influence in Russian politics until the early 2000s. It was here that the ROC had finally managed to climb to the top of the religious market. With the help of state subsidies, privileges, and negative restrictions on other religions, the Russian Orthodox Church became the public religion of the state of Russia. (Adamsky, 2019; Garrard & Garrard, 2008).

Regulated religious markets with a public religion are often characterized as (1) inefficient, (2) having low participation; page , and (3) as a tool for government officials to make

personal gains (Iannaccone, 1991). Russia satisfies all three of these common characteristics of public religions. However, the Garrards (2008) claim that Russian Orthodoxy became a public religion rather than a religious monopoly by design, rather than coincidence. They claim that Patriarchate Aleksy made it a point to keep some kind of legal separation between the church and the Russian state. The Garrards (2008) claim that Aleksy was inspired to do so through his experience as President of the European Council of Churches. In that role, they claim he witnessed the impacts of religious monopolies on religious participation. In contrast, when he looked toward secular states, he saw that the lack of state sponsored religious resulted in high religious participation. Instead of seeking state sponsored religious domination, Patriarch Aleksy guided the ROC towards cultural power – heavily emphasizing the connection between Russian identity and Russian Orthodoxy (Garrard and Garrard, 2008). Yet, as Smith ([1759], 2009) has pointed out, states also have motives to support state-controlled religion. The state may use the religion as an institutional tool to support their regime while also not giving the religious institution the opportunity to threaten their power (Smith [1759], 2009); Ekelund, Hebert, and Tollison, 2005).

Literature Review

The Economics of Religion

In his seminal work, *The Wealth of Nations*, Adam Smith discusses how religions navigate religious markets and the optimal relationship between government and religion (Smith [1759], 2009; Edelund, Hebert, and Tollison, 2005). Smith ([1759], 2009) emphasizes the need of competition in religious markets. Competition allows for religious markets to flourish because the individual needs of consumers are not the same for everyone. Demand in religious markets from consumers are all different based on their religious beliefs and preferences. This means that

suppliers also need to be different to match the consumer demand (Smith [1759], 2009; Edelund, Hebert, and Tollison, 2005).

In societies with monopolized religions, issues arise (Smith [1759], 2009; Edelund, Hebert, and Tollison, 2005). Smith ([1759], 2009) identifies two objections to these monopolies. First, that they often inspire fanatical behavior in the governments which leads to instability. Second, that a consumer's ability to freely choose a religion is severely limited. Smith claims that instability in government and limits on demand both contribute to poor economic development (Smith [1759], 2009; Edelund, Hebert, and Tollison, 2005).[1]

However, Smith ([1759], 2009) also identifies some beneficial reasons that a state might support a monopolized religion. A state may see religion as a threat to its power and want to mold that institution to their benefit to avoid potential uprisings (Smith [1759], 2009; Edelund, Hebert, and Tollison, 2005). This relationship is also beneficial to the religion itself. By becoming a monopolized religion, that religion does not have to navigate the religious market like their competitors. It is given a top status without having to do the work (Smith [1759], 2009; Edelund, Hebert, and Tollison, 2005).

Inspired by Adam Smith's ([1759], 2009) often overlooked comments on the economics of religion in *The Wealth of Nations*, scholars started to apply economic theories to religions in contradiction to the popular secularization theory. This resulted in an explosion of literature surrounding the application of economics to religion. Many scholars focus on the impacts of unregulated religious markets on religious demand (Stark & Iannacconne, 1994; Iannaccone et

---

[1] For a more in-depth interpretation of Adam Smith's analysis of the economics of religion in *The Wealth of Nations* see Edelund, Hebert, and Tollison (2005).

al., 1997; Stark & Finke, 2000). These scholars are focusing on the more macro- approach to the theory. For example, in their foundational work *Age of Faith: Explaining the Human Side of Religion*, Rodney Stark and Roger Finke (2000) outline a theoretical model of religious economics. They define religious economy as ". . . all of the religious activity going on in any society: a 'market' of current and potential adherents, a set of one or more organizations seeking to attract or maintain adherents, and the religious culture offered by the organization(s)" (Stark & Finke, 2000: 193). In other words, a religious economy is a religious market made up of suppliers, demanders, and products that are being produced. Stark and Finke's model (2000) identifies the supply-side of the market as what determines the dynamics of the market, whereas the demand-side determines how stable the market is. One consistent theme in Stark and Finke's (2000) article as well as in the literature is how things like state religions and regulations impact the supply-side of the religions market. Barro and McCleary (2003) find that when there are state regulations or state religions, that the economic growth of the state is impacted due to the subsidies being paid.

Other scholars focus more on the micro-level analysis of the market, or the demand side. Some focus on the role of religious preferences and formation of these preferences, such as Darren Sherkat (1991). Sherkat (1991) argues that religious preferences guide individual decision-making surrounding religion. These religious preferences are shaped through various networks that the individual is a part of, for example social networks such as family or friends (Sherkat, 1991). Other scholars have extended this argument and focus on the specific catalysts that drive these religious preferences. Research originally surrounded catalysts such as social class. Class was found to a relatively weak influence on the development of religious preferences (Stark, 1971). As a result, researchers pivoted to focus instead on impacts of socialization on

religious preferences. Sherkat and Wilson (1995) found that when individuals make a choice to switch religious or quit religion altogether, these choices are largely influenced by the social networks of the individual (1995). Other catalysts surrounding social influences that have been studied include gender (Thompson, 1991; Miller & Hoffman, 1995), race and ethnicity (Ellison & Sherkat, 1995), life events/crises (Ellison, 1991; Iannaccone, 1988), and religious niches (Sherkat, 1998) (Stark & Finke, 2000).

This research paper this specifically looking at how the Russian public perceives the relationship between the Russian Orthodox Church and Russia's nuclear complex. This research paper contributes to several holes in the literature. First, much of the research on the economics of religion have focused on Western countries. This research paper applies the market theory of religion to the Russian Orthodox Church in Russia which is a state and a region that has not been studied extensively in this subfield. Second, time series analysis is the primary econometric method used here. Although time-series is popular in economics, it has not been used much in economics of religion due to issues surrounding data availability (Box-Steffensmeier et al., 2014). This research paper introduces a measurement method to attempt to bring this econometric method to the study of the economics of religion. This is important because studying across time allows researchers to have a deeper understanding of social processes that are moving across time (Box-Steffensmeier et al., 2014). When looking specifically at a single point in time, it severely limits a researcher's ability to establish causal claims. Focusing on studying religion across time opens the door to how it interacts with other social processes. It also gives scholars insight to how these processes behave with each other and how those behaviors have changed, if at all, across time (Box-Steffensmeier et al., 2014). Finally, this research paper uses the Dyad Ratios Model as a solution to data unavailability issues that

scholars battle in this region and subfield.

Theory

This research paper applies the religious market theory to the relationship between the Russian Orthodox Church and Russia's nuclear institutions. Broadly, the religious market theory views religion in society functioning similarly to the state's commercial economy (Stark and Finke, 2000; Ahdar, 2006). They have functional similarities: both rely on supply and demand to produce products for society. In a secular commercial economy, the suppliers are usually companies or firms who are looking to sell a variety of commercial products (clothes, cars, etc.) to the consumers (demand). In the religious economy, the suppliers are various religious organizations (acting like firms) that produce religious products to entice potential followers to join their organization over another (Stark and Finke, 2000; Ahdar, 2006). As identified by many religious market theorists (see Smith, [1759] 2009; Iannaccone, 1988; Finke & Stark, 1997; Ahdar, 2006) and economic market theorists (see Lipsey & Chrystal, 1999; Scherer, 1987), the crux of both high functioning religious markets and commercial markets is the existence of competition.

Like Smith ([1759]; 2009) identified, this competition is fostered through deregulation of the markets. Monopolies create issues in both commercial and religious markets (Smith [1759], 2009; Ahdar, 2006). They lead to issues such as increases in prices, decreases in consumer demand, lack of availability of choices for the consumer and decreases in available resources for production (Ahdar, 2006: 57). The religious market theory claims that monopolies result in lack of religious participation. To go even further, any kind of regulation that limits competition has adverse effects on the religious economy (Smith [1759], 2009; Ahdar, 2006). For example, governments may regulate religion through negative or positive regulations.

With the support of the above background context, this research paper furthers the analysis of the Russian Orthodox Church in Russia's religious market. Religious market theory suggests that upon *glasnost*, the Russian Orthodox Church was thrown back into the religious market of Russia along with many competing religious organizations. To compete for consumers, the Russian Orthodox Church had to participate in various strategic initiatives to stay relevant in a sea of religious choices. Adamsky (2019) argues that early in deregulation, the Russian Orthodox Church aligned itself with the Russian military and nuclear industries in a bottom-up approach to gain more followers. This research paper tests whether a relationship between Russian Orthodoxy and Russia's nuclear industry does exist according to public perception.

CHAPTER 2

METHODOLOGY

Data

Data used in time series analysis requires enough data to complete a continuous series across time. In this study, the series each run from 1999 to 2021. The length of each of the series were limited by data availability. International religious data that is consistent across time is scarce (Grim and Finke, 2005). As a result, it was difficult to find a yearly series about religious affiliation in Russia. To combat lack of data availability, a series about the public perception of Russian Orthodoxy was created using the dyad ratios model (for more explanation, see the Dyad Ratios section of this chapter) (Stimson, 2017).

To create the Nuclear series, data was collected from Our World in Data's Estimated Nuclear Warhead Stockpiles (2023). The source of this data was from the Federation of American Scientists, and it measures the estimated number of active nuclear warheads by country from 1945 to 2023 (Our World in Data, 2023). The data is estimated because the actual number of nuclear warhead stockpiles are secret. Our World in Data and the Federation of American Scientists primarily use other accessible public information and past historical records to create the estimated values. The data is updated annually. For this series, Russia's estimated nuclear warhead stockpiles were included from 1999 to 2021 (Our World in Data, 2023). It should be clarified that this series was not looking to measure Russian nuclear power. The dataset used does not distinguish the nuclear warheads by power (Our World in Data, 2023). Instead, this series was looking to measure Russia's commitment to their nuclear program.

Figure 1: Nuclear Series from 1999 to 2021
Adapted from the Federation of American Scientists (2023) – with minor processing by Our World in Data. "Estimated nuclear warhead stockpiles" [dataset].

Federation of American Scientists, “Estimated Global Nuclear Warhead Inventories” [original data]. Content available through Creative Commons.

Dyad Ratios Model

As stated above, consistent data concerning religion in Russia is scarce. To address this issue and to be able to use time series analysis, a latent series of the Russian public’s view of Russian Orthodoxy from 1999 to 2021 is estimated. Stimson’s (2018) dyad ratios model provides a way for scholars to study various aspects of public opinion across time. This is usually very difficult as data on public opinion is mostly gathered from survey methods. These surveys are very rarely consistently across time, which limits the research that can be done especially when it comes to methods such as time series. The dyad ratios model provides a method of measurement to combat data availability. It has been proven to be a reliable substitute for consistent data (see Stimson, 2018; Bae & Algara, 2023).

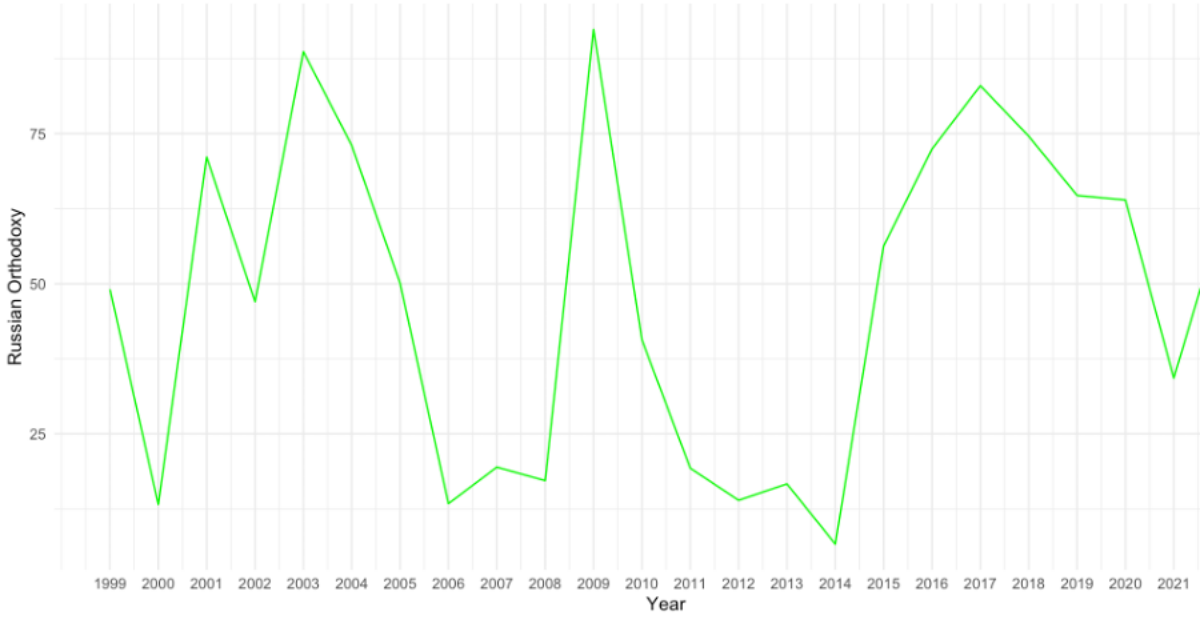
To use Stimson’s (2018) dyad ratios model, survey data is collected from multiple surveys from Levada that measures Russian Orthodoxy. This survey data is then pooled together to estimate the latent prevalence of Russian Orthodoxy in the public’s view. Once the series has

been created, it is then ‘cleaned’ to reduce noise in the series. The questions included in the original dyad ratios model reference several aspects of Russian Orthodoxy in Russian society. The most consistent question across the series was: “Which of these holidays do you plan to celebrate? [Orthodox Christmas, January 7]” (Levada, 2022). This type of question addresses the participation aspect of religion. However, other aspects of Orthodoxy such as beliefs (e.g., “Do you believe in religious miracles?” (Levada, 2022)), belonging (“Do you belong to a religious group?” (Levada, 2023b)), and relationship with Russian government (e.g., “Do you believe that church should influence government decision-making?” (Levada, 2020a)). The point was to cover as many aspects of Russian Orthodoxy in society as possible to attempt to create the best possible latent series. The Russian Orthodox Church is many things – it is an institution as well as a religious entity, among other things. Because of the complexity of the Russian Orthodox Church and its relationship with Russian society, measurement is difficult. The goal in creating this series was to create a composite variable covering as many aspects of the Russian Orthodox Church as possible. The Dyad-Ratios Model allows for different aspects of the Russian Orthodox Church to make up the series while also helping to combat lack of data.

After the series was cleaned, four questions remained that make up the ‘cleaned series’ of Russian Orthodoxy. These were: (1) Do you belong to a religious group? If so, which one? [*Orthodoxy*] (Levada, 2023b), (2) What are you planning to eat during lent? [P*lanning to fast partially (no meat, alcohol etc.), Planning to fast completely for the final week, Planning to fast completely for the entire seven weeks*] (Levada, 2020a), (3) Do you believe in bad eye, bad spells? [*I believe they exist, They probably exist*] (Levada, 2022), and (4) How much influence do you believe the church and other religious organizations exert on government policies in Russia? [*Exactly as much as should be, Somewhat less than is necessary, Not enough*] (Levada,

2020a). The dyad ratios model identified these four questions as having the most explanatory power. Together, the four questions explain 72.75% of the variance. Each question also represents each of the four aspects of Russian Orthodoxy that were included in the original series survey data: question (1) demonstrates the belonging aspect, question (2) demonstrates the practice/participation aspect, question (3) demonstrates the belief aspect, and question (4) demonstrates the ROC's relationship with the Russian government. For more information on the survey data included in the series and the cleaned series, please see Appendix A.

Figure 2: Russian Orthodoxy Series from 1999 to 2021
Created with survey data from various Levada surveys.
(see Appendix A)



Univariate Dynamics

To begin cointegration analysis, the univariate models of each series must be estimated. Through these univariate models, the length of the shocks that are affecting each series can be estimated. The length of the shock in each series can either be long-memory or short-memory (Box-Steffensmeier et al., 2014). A series that has a long-memory does not have an equilibrium.

This means that shocks will continue to affect the series until another shock occurs. Whereas a series that has a short-memory does return to an equilibrium, so shocks are temporary and do not impact the series long-term (Box-Steffensmeier et al., 2014). In this research paper, two unit-root tests were utilized: the Augmented Dickey-Fuller Test (ADF) and the Kwiatkowski, Perron, Schmidt, and Shin (KPSS) test. Neither of these unit-root tests are perfect in their diagnoses alone, so both tests are necessary to diagnose the presence of unit-root (Box-Steffensmeier et al., 2014).

The Augmented Dickey-Full Test (ADF) tests the null hypothesis that the series is nonstationary or unit root. ADF is similar to the Dickey-Fuller test, but it additionally allows for heterogeneity and serial correlation in errors (Box-Steffensmeier et al., 2014; Dickey and Fuller, 1979). When looking at the results, the null hypothesis of unit root is rejected when the test statistic is lower than the critical value. Rejection of the null would mean that the series is stationary. Whereas, acceptance of the null would mean that the series is nonstationary. Table 1 displays the ADF tests for both series. For the Orthodoxy series, the ADF tests indicate that the series are unit roots. These results hold even when including lags and a trend. For the Nuclear series, the ADF tests indicate that the series is stationary until both a lag of two and trend are included.

Table 1: ADF Test Results

Series	T-Statistic	CV 1%	CV 5%	CV 10%
Orthodoxy	-1.641	-3.750	-3.000	-2.630
Orthodoxy with 2 lag	-1.364	-3.750	-3.000	-2.630
Orthodoxy with 2 lag and trend	-0.617	-4.380	-3.600	-3.240

Nuclear	-10.886	-3.750*	**-3.000***	**-2.630***
Nuclear with 2 lag	-3.796	**-3.750***	**-3.000***	**-2.630***
Nuclear with 2 lag and trend	-3.526	-4.380	-3.600	-3.240

* = stationary

The ADF test has low power that can sometimes result in misleading nonstationary results (Box-Steffensmeier et al., 2014). To avoid misleading results, it is important to also test for unit root using the Kwiatkowski, Perron, Schmidt, and Shin test (KPSS). For this test, the null hypothesis is stationarity (absence of unit root). The test has higher power due to the null of stationarity. If the test statistic is higher than the critical value, then the null is rejected. Rejection of the null means that the series is nonstationary (Box-Steffensmeier et al., 2014). For Orthodoxy, the null hypothesis is rejected across all critical values. The null is also rejected across all critical values except 10% when including trend. For the Nuclear series, the null is rejected across all critical values (see Table 2).

Table 2: KPSS Test Results

Series	**T-Statistic**	**CV 1%**	**CV 5%**	**CV 10%**
Orthodoxy	3.244	2.106	1.485	1.160
Orthodoxy + trend	0.179	0.191*	0.148	0.128
Nuclear	3.777	2.106	1.485	1.160
Nuclear + trend	0.245	0.191	0.148	0.128

* = stationary

Together, the ADF and KPSS tests indicate that both the Orthodoxy and Nuclear series are long-memory processes. This suggests that each series does not have an equilibrium (constant mean) that it immediately returns to after a shock. When a series lacks an equilibrium, shocks continuously affect the series until another shock occurs. results of these tests also are evidence of proper model specification (Box-Steffensmeier et al., 2014).

Long-Term Dynamics: Johansen's Cointegration Test

Cointegration is best explained by Miller's (1994) example concerning a drunk person and a dog (Box-Steffensmeier et al., 2014). After a person gets inebriated in the bar, they begin to walk (or stumble) home. This would be an example of a non-stationary series. The person is not walking in a straight line and does not have an equilibrium they are returning to. The same applies to a dog who is freely running through the streets. Often, the dog may be distracted by things like squirrels and other people, so it is also not walking in a straight line. This is another example of a non-stationary series. However, the context of these series changes if the dog belongs to the drunk person. Miller illustrates that the when the person entered the bar, they left their dog tied up outside. By the time they leave, the dog has come off of its leash and is wandering about. As the drunk person is stumbling home, they are calling out to the dog and looking for it. When the dog hears this, it runs towards the drunk person and barks. As the dog barks, the drunk person stumbles in the direction of the dog. As was established earlier, individually both the drunk person and the dog's journeys are non-stationary, or random walks. However, when the dog is owned by the drunk person they now share a joint location (or equilibrium) and together than journeys become stationary. This means that they are cointegrated. This cointegration tells us that the location of the dog can tell us more about the location of the drunk person and vice versa. To begin the analysis, the Russian Orthodoxy and

the Nuclear series' univariate dynamics were both analyzed. Like the drunk person and the dog, each of the series were found to be individually non-stationary, or random walks. The next step in the analysis is to use cointegration to see if there is some kind of relationship between the series, like the dog belonging to the drunk person (Miller, 1994; Box-Steffensmeier et al., 2014).

To test for cointegration between these pair of series, the Johansen cointegration test is used. The first step in this analysis is identifying the optimal lag. There are several approaches to finding the optimal lag length of a variable series. For this research paper, the approach chosen uses three types of information criteria: Akaike information criterion (AIC), Schwarz Bayesian information criterion (SC), and the Hannon-Quinn information criterion (HQ). All three criterion should be analyzed in conjunction with each other. All three information criteria indicated the optimal lag length is one lag (see Table 3).

Table 3: Optimal Lag Results

Lag	AIC	HQ	SB
0	22.6953	22.7248	22.7949
1	17.3572*	17.4155*	17.6559*
2	17.678	17.7752	18.1759

* = optimal lag

Now that both series have been characterized as I(1) and the optimal lag has been determined, the next step is testing for cointegration between the series. The cointegration test being used in this research paper is the Johansen cointegration test (Johansen, 1988). This test is very useful when using cointegration to test three or more series because it estimates the entire system concurrently (Box-Steffensmeier et al., 2014). However, even when using two series, the Johansen test differs from other cointegration tests. Other tests can have differing results

depending on the choice of cointegrating vector. The Johansen test avoids this issue. The Johansen test also has higher power than other cointegration tests, like the Engle-Granger test.

Table 4 presents the results of the Johansen test (see Box-Steffensmeier et al., 2014 for more details on the test itself). Two test statistics are used: the TRACE and MAX statistics. For each of the statistics, the critical values (CVs) for each test are compared. The larger the eigenvalues are, the further they are from the unit root. The rank of the matrix, r, is equal to the number of cointegrating vectors (Box-Steffensmeier et al., 2014). That is,

r = 0 means that each series is independence and there is no cointegration;

r = 1 means that the two series are cointegrated.

A pair of cointegrated series have one cointegrating vector. The results of the Johansen test indicate that the Orthodoxy and Nuclear series are cointegrated. Using the trace statistic, the hypothesis that there are less than 1 cointegrating vectors in the data can be rejected. Using the max statistic, the null hypothesis that r is equal to 1 fails to be rejected. Both statistics find that there is one cointegrating vector. This means that the Orthodoxy and Nuclear series are cointegrated. In other words, the series respond to each other.

Table 4: Johansen Cointegration Results

Max	Eigenvalue	Trace
0	-	46.6087
1	0.85135	2.7675*
2	0.11337	-

* = cointegrating vector

Short-Term Dynamics

Identifying Dynamic Behavior

In the previous section, cointegration between the Russian Orthodoxy and Nuclear series was established. The first possible model is that there is no relationship between the two series. The cointegration results are evidence that this model is unsubstantiated. The cointegration between the Russian Orthodoxy and Nuclear series provides a big picture look at the relationship between the two series. Cointegration suggests that the two series have a long-term relationship with each other. However, even though two series may be cointegrated, how they move in the short-term may be different. Now that there is evidence of a relationship existing between the two series, the short-term adjustments of each of the series can be analyzed.

Learning about these short-term adjustments is an important part of the analysis – these adjustments demonstrate how the series behave with each other (De Boef and Keele, 2008). By looking at short-term dynamics, the immediate changes that occur in the relationship can be analyzed. Often, these immediate changes are hidden when looking strictly at long-term dynamics. These immediate changes can be studied by testing multiple types of error correction models (ECMs).

De Boef and Keele (2008) suggest that scholars should identify mean and median lag length of the series to learn more about its short-term dynamics. The mean and median lag length can provide more information about how long it takes for shocks in the series to disperse (De Boef and Keele, 2008). To identify the mean and median lag length of the series, the optimal lag of each individual series should be identified (see Table 5). Optimal lag of both series were identified during the cointegration analysis (see Table 4). However, here the optimal lag of each series individually must be identified (see Table 5). As displayed in the table, the optimal lag of each series individually is also 1. This would mean that the mean and median lag length of the series collectively would be one, because the optimal lag of each series is the same (1 lag).

The median lag length is ". . . the first lag, r, at which at least half of the adjustment toward long-run equilibrium has occurred following a shock" (De Boef and Keele, 2008: 192). In other words, median lag length demonstrates how quickly the shock disperses, or goes away, in the series. For the series in this study, the median lag length is 1. This implies that there are relatively quick reactions to shocks within the series, but they are not immediate (De Boef and Keele, 2008). Where the median lag length tells us about how quickly the series respond to shocks, the mean lag length tells us how long it takes for the series to revert back to the equilibrium after a shock occurs (De Boef and Keele, 2008). Like the median lag length, a mean lag length of one implies that the series revert back to the equilibrium rather quickly – within one period (one year). Both the median and mean lag length of this series further stresses the importance of examining the short-term dynamics of this series.

Identifying Causal Behavior

Error correction models also provide a framework to test for causality (De Boef and Keele, 2008). By analyzing long-term dynamics, assumptions cannot be made about the causality of the series. Since a cointegrated relationship between the two series was established, there are now four possible causal outcome models in this research paper: (1) Russian Orthodoxy causes changes in the Nuclear series, (2) Nuclear causes changes in the Russian Orthodoxy series, (3) there is an underlying process driving changes in both series (the series are cointegrated, but not casual). Each of these possible models are addressed using error correction models.

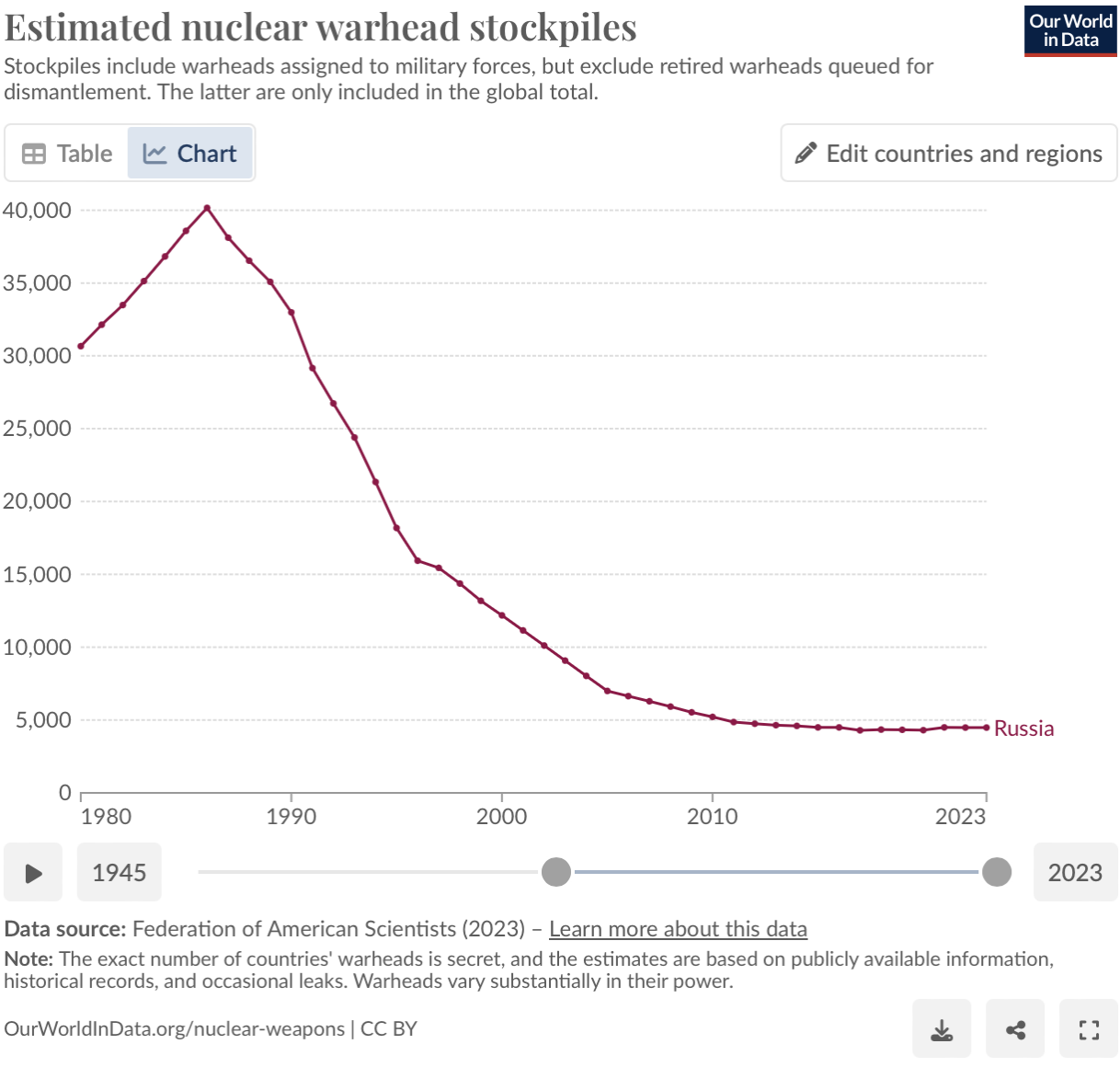
Heteroskedasticity Check

The Breusch-Pagan test is used to test for heteroskedasticity in a model (Breusch and Pagan, 1979). Having heteroskedasticity in a model is problematic. Standard errors are most likely undependable as a result (Smith and Fuertes, 2010). It would also suggest that the model is

most likely incorrectly specified and therefore unreliable (Smith and Fuertes, 2010).

Heteroskedasticity was expected in this model due to the nature of the data in the Nuclear series (see Figure 3).

Figure 3: Estimated Nuclear Warhead Stockpiles 1980 – 2023
"Data Page: Estimated nuclear warhead stockpiles", part of the following publication: Bastian Herre, Pablo Rosado, Max Roser and Joe Hasell (2024) – "Nuclear Weapons". Data adapted from Federation of American Scientists. Content available through Creative Commons.



The null hypothesis of the Breusch-Pagan test is that there is constant variance in the model (homoskedasticity) (Smith and Fuertes, 2010). The results of the Breusch-Pagan test suggest that there is heteroskedasticity in the Nuclear series, as expected (see Table IDK ANYMORE). The null hypothesis of homoskedasticity is rejected for the Nuclear series. As for the Orthodoxy series, the null hypothesis of homoskedasticity fails to be rejected. To filter out the heteroskedasticity in the Nuclear series, all error correction models were ran with the 'robust' command to avoid issues stemming from heteroskedasticity in the models.

Table 5: Breusch-Pagan heteroskedasticity test results

Series	Chi-Squared Statistic	P-value
Orthodoxy	3.16	0.0757
Nuclear	8.55	0.0035*

* = significant at the 0.05 level

Short-Term Effects

When determining the short-term effects of series, scholars often use either autoregressive distributed lag models (ADL) or error correction models (ECM). This research paper implements error correction models for the reasons De Boef and Keele (2009) identify. First, error correction models are useful in time series analysis because they are " . . .[a type of] model that directly estimates the rate at which Y changes to return to equilibrium after a change in X" (De Boef and Keele, 2008: 189). This contributes to testing for causality as ECMs are testing to see how two series are connected in the long-term. More specifically, ECMs are looking to see whether one of the series adjusts to the increases and decreases of the other series (De Boef and Keele, 2008).

It is best practice to begin with the general error correction model and then move on to use other types of ECMS that test restrictions to learn more about the series' behaviors (De Boef and Keele, 2008). In this research paper, the general error correction model is tested first (see Table 5 for more information). Then, the partial adjustment, dead start, and finite distributed lag ECMs are tested. These ECMs are chosen based on the dynamic quantity information about the models (the mean and median lag length) (De Boef and Keele, 2008).

Table 6: Error Correction Models and Restrictions:
Adapted part of a table from De Boef, Suzanna and Luke Kelle. "Taking Time Seriously." American Journal of Political Science 52, no. 1 (2008): 190. Copyright 2024 John Wiley and Sons. See Appendix B.

Type	ECM Model	Restriction
General	$\Delta Y_t = \alpha_0 + \alpha_1^* Y_{t-1} + \beta_0^* \Delta X_{t-1} + \varepsilon_t$	**None**
Partial Adjustment	$\Delta Y_t = \alpha_0 + \alpha_1^* Y_{t-1} + \beta_0^* \Delta X_t + \varepsilon_t$	$\beta_1^* - \beta_0^* = 0$
Dead Start	$\Delta Y_t = \alpha_0 + \alpha_1^* Y_{t-1} + \beta_1^* \Delta X_{t-1} + \varepsilon_t$	$\beta_0^* = 0$
Finite Distributed Lag	$\Delta Y_t = \alpha_0 + \alpha_1^* Y_{t-1} + \beta_0^* \Delta X_t + \beta_1^* X_{t-1} + \varepsilon_t$	$\alpha_1^* = -1$

Using the general, partial adjustment, dead start, and finite distributed lag ECMs, two influencing change models are tested: (1) that Orthodoxy influences change in Nuclear and (2) that Nuclear influences change in Orthodoxy. Effects are nonsignificant across all models except for the finite distributed lag ECM.

Finite Distributed Lag

A finite distributed lag model is "A dynamic model where one or more explanatory variables are allowed to have lagged effects on the dependent variable" (Wooldridge, 2020: 801). This error correction model supports the idea that the effects on *y* may not be evident immediately (Wooldridge, 2020). For example, when creating a model analyzing whether a person's decision to have a child is influenced by the personal tax exemption of having a child, a

finite distributed lag could be used. This would account for the fact that when a person decides to have a child, there would not be immediate changes in their personal tax exemption. There are outside factors that are preventing the immediate change – things like the amount of time it takes to adopt or have a child. These lags can be accounted for in the model using the finite distributed lag error correction model (Wooldridge, 2020).

When applying the finite distributed lag model to this research paper, it is suggested that changes in Orthodoxy would not immediately influence changes in Nuclear – there may be lagged influence. This also suggests that the influence of change will only continue on for a short period of time (Box-Steffensmeier, 2014). This model supports the findings about the short-term dynamics of the Orthodoxy and Nuclear series. Both series have a mean and median lag length of 1 (one) which suggests that the series respond to shocks and return to equilibrium rather quickly (but not immediately). This is also supported by the optimal lag of 1 (one). When applying the optimal lag of one to the finite distributed lag model, the results show evidence that Orthodoxy does have a lagged influence on Nuclear. With a one-unit increase in Orthodoxy, there is a lagged decrease in Nuclear by 294.94 (see Table 7).

Table 7: Finite Distributed Lag Error Correction Model Results

Lag	Coefficient	Robust Standard Error	P-Value
0	-88.60797	133.3178	0.514
1	-294.9419	133.3846	0.043*

* = statistically significant at the 0.05 level

A prevalent issue with the use of distributed lag error correction models is autocorrelation (Fuller and Martin, 1961). To test for autocorrelation in the finite distributed lag model here, the Durbin-Watson Test was used (Durbin and Watson, 1992). The null hypothesis of the Durbin-

Watson test is non-autocorrelation of the residuals. The test parameters range from zero to four. If the output value is closer to zero, then this an indication of positive autocorrelation. Whereas, if the output value is closer to two, then this an indication of non-autocorrelation. The output for the Durbin-Watson test used here is 0.2090335. This value appears to be much closer to zero than two. However, to ensure proper identification, the Durbin-Watson significance tables are used. For this test, the sample size was 23 and the number of regressors were three. This means that the d-statistic should be between 0.832 to 1.40. The value at 0.2090335 is lower than the lowest parameter. This suggests that there is autocorrelation in the residuals of the model (Durbin and Watson, 1992). Therefore, the significant results from the finite distributed lag ECM are unreliable.

Using the general, partial adjustment, and dead start ECMs, two influences of change models are tested: (1) that Orthodoxy influences change in Nuclear and (2) that Nuclear influences change in Orthodoxy. Effects are nonsignificant across all models. These results suggest that each series does not influence change in the other. This leaves one possible model: that Russian Orthodoxy and Nuclear share an underlying process that drives both series.

CHAPTER 3

IMPLICATIONS AND CONCLUSIONS

This research paper has several theoretical implications pertaining to the underlying process that is driving both the public perception of Russian Orthodoxy and Russia's nuclear-military complex. Theory suggests several possible underlying processes that could be driving these two series. Nationalism and national identity and rent-seeking institutions are two of the many theories that could explain the potential underlying process.

Nationalism and National Identity

The literature surrounding religion and nationalism is full of different approaches attempting to explain how the relationship between the two generally comes to exist. Some scholars view religion and nationalism as being very analogous. Others view religion as explaining nationalism's existence (Brubaker, 2011). Gorski and Turkmen-Dervisoglu (2013) identify two instances where religious nationalism occurs. First, when people view "their nation [as being] religiously based" (Rieffer, 2003). Second, when religion is "central. . . to conceptions of what it means to belong to a given nation" (Barker, 2009: 12).

When briefly analyzing the relationship between religion and nationalism in Russia, there are a few important contexts to remember. First, that Russia uses religion, specifically the Russian Orthodox Church, to legitimize its fight for irredentism. Second, that the Russian Orthodox Church has played a pivotal role in unifying what it means to be Russian. The Russian Orthodox church pushes the discourse of *Russki mir* (Russian world) (see Surzhko Harned, 2022). For these reasons, nationalism and Russia's irredentist agenda could be the underlying process driving both the Russian Orthodoxy and Nuclear series.

Rent-Seeking Institutions

Market theory suggests that cointegration between the public's perception of Russian Orthodoxy and Russia's military-nuclear complex could be explained by both the Russian Orthodox Church and Russia's nuclear institutions as being rent-seeking. Conventional rent-seeking theory suggests that when institutions are rent-seeking, monopolies can occur (Khan, 2000). This could explain the moves toward public religion that the Russian Orthodox Church has made since glasnost. The Russian government also pays subsidies to the Russian Orthodox Church, which is evidence of a transactional relationship (Adamsky, 2019). It is possible that in return for these subsidies, Putin expects the Russian Orthodox Church to support his regime and vision. Using religion to unify people while quelling the potential of uprising both from the people and the church themselves would on its face be beneficial to his regime and continuity of power.

This research paper takes the position that rent-seeking is most likely the underlying process driving both of the series. The Russian Orthodox Church has worked to survive for hundreds of years. Before the Bolshevik revolution, the ROC was the state religion of Russia. Even during Communism, the ROC fought to survive by being complicit with the Soviet government. Now, it is unsurprising to see the ROC rising back to power. Arguably, the Russian Orthodox Church as an institution has continued its strategic navigation to ensure its survival. The Russian Orthodox Church and its actors arguably saw the Nuclear institutions in a tough spot after dissolution. They worked with them and brought the Russian government's attention back to them. As Nuclear institutions became important in Russian society once again, the Russian Orthodox Church rode its coattails, taking advantage of the networking it had done during its bottom-up approach. These strategies potentially could have led the ROC where it is

today. As a rent-seeking institution, it does not have to participate in bottom-up strategies to try and recruit members. Through state subsidies and regulations, the Russian Orthodox Church can guarantee their existence and their place as the top religious institution in the state. That is, as long as the regime agrees.

Further analysis of these potential underlying processes is outside of the scope of this research paper. Nationalism and rent-seeking institutions are two of many potential theories that could explain this relationship. However, this research paper has provided the groundwork in suggesting that there is an underlying process driving the two series. What that underlying process is will be a matter of future research.

In conclusion, the question of whether a relationship exists between Russian Orthodoxy and Russia's military-nuclear complex was addressed. Previous research has made a connection between the Russian Orthodox Church and Russia's military at the levels of the elite (Adamsky, 2019). This research paper instead focuses on how this relationship is seen from the view of the general public. Using the dyad ratios model, a series was created to measure Russian Orthodoxy from the public's point of view. The Johansen's cointegration test was then used to test for cointegration between Russian Orthodoxy and Russia's estimated number of active nuclear warheads. A cointegrated relationship was found between the two. However, four error correction models tested for influences of change and found that neither series directly influenced change in the other. This means that the two series are driven by the same underlying process. The question of what that underlying process is should be addressed in future research.

REFERENCES

Adamsky, Dmitry. *Russian Nuclear Orthodoxy: Religion, Politics, and Strategy*. Stanford: Stanford University Press, 2019.

Ahdar, Rex. "The Idea of 'Religious Markets'." *International Journal of Law in Context* 2, no. 1 (2006): 49 – 65.

Bea, Byengseon and Carlos Algara. "Fenno's Paradox in a Polarized Age: How Polarization Lowers the Mass Public's Assessments of Congress and Legislators." *Congress and the Presidency* 50, no. 1 (2023): 76 – 107.

Barket, Phillip W. *Religious Nationalism in Modern Europe: If God Be for Us*. London: Routledge, 2009.

Barro, Robert J. and Rachel M. McCleary. "Religion and Economic Growth Across Countries." *American Sociological Review* 68, no. 5 (2003): 760 – 781.

Box-Steffensmeier, Janet, John Freeman, Matthew Hitt, and Jon C.W. Pevehouse. *Time Series Analysis for the Social Sciences.* Cambridge University Press, 2014.

Breusch, T.S. and A.R. Pagan. "A Simple Test for Heteroskedasticity and Random Coefficient Variation." *Econometrica* 47, no. 5 (1979): 1287 – 1294.

Brubaker, Rogers. "Religion and Nationalism: Four Approaches." *Nations and Nationalism* 18, no. 1 (November 2011): 2 – 20.

De Boef, Suzanna and Luke Keele. "Taking Time Seriously." *American Journal of Political Science* 52, no. 1 (2008): 184 – 200.

Dickey, David and Wayne Fuller. "Distribution of the Estimators for Autoregressive Time Series with a Unit Root." *Journal of the American Statistical Association* 74, no. 1 (1979): 427 – 431.

Durbin, J. and G.S. Watson. "Testing for Serial Correlation in Least Squares Regression.I" in S. Kotz and N.L. Johnson, eds., *Breakthroughs in Statistics*. New York: Springer, 1992. Ekelund, Robert B., Robert F. Hebert, and Robert D. Tollison. "Adam Smith on Religion and Market Structure." *History of Political Economy* 37, no. 4 (2005): 647 – 660.

Ellison, Christopher. "Religious Involvement and Subjective Well-Being." *Journal of Health and Social Behavior* 32, no. 1 (1992): 80 -99.

Ellison, Christopher and Darren Sherkat. "The 'Semi-Voluntary Institution' Revisited: Regional Variations in Church Participation Among Black Americans." *Social Forces* 73, no. 4 (1995): 1415 – 1437.

Engle, Robert and C.W.J. Granger. "Co-Integration and Error Correction: Representation, Estimation, and Testing." *Econometrica* 55, no. 2 (1987): 251 – 276.

Finke, Roger and Rodney Stark. "Religious Choice and Competition." *American Sociological Review* 63, no. 5 (1998): 761 – 766.

Garrard, John and Carol Garrard. *Russian Orthodoxy Resurgent*. Princeton University Press, 2008.

Gill, Anthony. *The Political Origins of Religious Liberty*. New York: Cambridge University Press, 2008.

Gorski, Phil and Gulay Turkmen-Dervisoglu. "Religion, Nationalism, and Violence: An Integrated Approach." *Annual Review of Sociology* 39 (2013): 193 – 210.

Grim, Brian J. and Roger Finke. "Documenting Religion Worldwide: Decreasing the Data Deficit." *IASSIST Quarterly* Winter (2005): 11 – 15.

Hassner, Ron, ed. *Religion in the Military Worldwide*. New York: Cambridge University Press, 2014.

Iannaccone, Laurence. "A Formal Model of Church and Sect." *American Journal of Sociology* 94 (1988): S241 – S268.

Iannaccone, Laurence. "The Consequences of Religious Market Regulation: Adam Smith and the Economics of Religion." *Rationality and Society* 3 (1991): 156 – 177.

Iannaccone, Laurence, Roger Finke, and Rodney Stark. "Deregulating Religion: The Economics of Church and State." *Economic Inquiry* 35, no. 2 (1997): 350 – 364.

Johansen, Soren. "Statistical Analysis of Cointegration Vectors." *Journal of Economic Dynamics and Control* 12, no. 2 – 3 (1988): 231 – 254.

Levada. *About Us, 2024*. About Us, 2024. https://www.levada.ru/en/about-us/.

Levada. *Religiosity*. Russia: Levada, 2022.

Levada. *Attitudes to Religion*. Russia: Levada, 2020a.

Levada. *Church and State*. Russia: Levada, 2023a.

Levada. *Memory and Pride*. Russia: Levada, 2020b.

Levada. *The Soviet Union*. Russia: Levada, 2019.

Levada. *The Religious Beliefs*. Russia: Levada, 2023b.

Levada. *Church*. Russia: Levada, 2016.

Lipsey, Richard G. and Alex K. Chrystal. *Principles of Economics*. New York: Oxford University Press, 1999.

Miller, Alan and John Hoffman. "Risk and Religion: An Explanation of Gender Differences in Religiosity." *Journal for the Scientific Study of Religion* 34, no. 1 (1995): 63 – 75.

Our World in Data. *Estimated Nuclear Warhead Stockpiles, 1945 – 2023*. https://ourworldindata.org/grapher/nuclear-warhead-stockpiles

Pew Research Center. *Russian Return to Religion, But Not to Church*. LOCATION: Pew Research Center, 2014.

Rieffer, Barbara-An. "Religion and Nationalism: Understanding the Consequences of a Complex Relationship." *Ethnicities* 3, no. 2 (2003): 215 – 242.

Scherer F.M. "Antitrust, Efficiency, and Progress." *New York University Law Review* 62 (1987): 998 – 1019.

Sherkat, Darren. "Leaving the Faith: Testing Theories of Religious Switching Using Survival Models." *Social Science Research* 20, no. 2 (1991): 171 – 187.

Sherkat, Darren. "Counterculture of Continuity? Competing Influences on Baby Boomers' Religious Orientations and Participation." *Social Forces* 76 (1998): 1087 – 1115.

Sherkat, Darren and John Wilson. "Preferences, Constraints, and Choices in Religious Markets: An Examination of Religious Switching and Apostasy." *Social Forces* 73, no. 3 (1995): 993 – 1026.

Smith, Adam. *Wealth of Nations*. New York: Classic House Books, 2009.

Smith, Ron P. and Ana-Maria Fuertest. "Panel Time-Series." *V cemmap* (2010): 2 – 111.

Stark, Rodney and Laurence R. Iannacconne. "A Supply-Side Reinterpretation of the 'Secularizaton' of Europe." *Journal for the Scientific Study of Religion* 33, no. 3 (1994): 230 – 252.

Stark, Rodney and Roger Finke. *Acts of Faith: Explaining the Human Side of Religion*. 1st ed. University of California Press, 2000.

Stark, Rodney. "The Economics of Piety," in Geral Thielbar and Saul Fedlman, eds., *Issues in Social Inequality*. Boston: Little Brown, 1971.

Stimson, James. "The Dyad Ratios Algorithm for Estimating Latent Public Opinion: Estimation, Testing, and Comparison to Other Approaches." *Bulletin of Sociological Methodology* 137 – 138, no. 1 (2017): 201 – 218.

Thompson, Linda. "Family Work: Women's Sense of Fairness." *Journal of Family Issues* 12 (1991): 181 – 196.

U.S. Department of State. *International Religious Freedom Report*, 2007. https://2009-2017.state.gov/j/drl/rls/irf/2007/90196.htm

Wooldridge, Jeffrey M. *Introductory Econometrics: A Modern Approach*. 7th ed. Cengage Learning, 2020.

APPENDICES

APPENDIX A

Dyad Ratios Model Survey Series Components

Original Series Components

Questions used from Pew Research Center. *Russian Return to Religion, But Not to Church*. LOCATION: Pew Research Center, 2014.

PEWReligion – 1998, 2008

What is your religion, if any? (n = 1703)

Christian Orthodox

Questions used from Levada. *Religiosity*. Russia: Levada, 2022.

LEVMiracles – 1998, 2008, 2011, 2015, 2017, 2020, 2021, 2022

Do you believe in religious miracles? (n = 1614)

I believe they exist

They probably exist

LEVHeaven – 1998, 2008, 2011, 2015, 2017, 2021, 2022

Do you believe in the Kingdom of Heaven? (n = 1616)

I believe it exists

It probably exists

LEVSpells – 2010, 2012, 2015, 2017, 2020, 2021, 2022

Do you believe in bad eye, bad spells? (n = 1616)

I believe they exist

They probably exist

Questions used from Levada. *Attitudes to Religion*. Russia: Levada, 2020.

LEVInfluence – 1998, 2008, 2012, 2013, 2014, 2016

How much influence do you believe the church and other religious organizations exert on government policies in Russia? (n = 1614)

Exactly as much as should be

Somewhat less than is necessary

Not enough

LEVLent – 1998, 2000, 2003, 2008, 2010, 2012, 2013, 2014, 2016, 2017, 2020

What are you planning to eat during lent? (n = 1614)

Planning to fast partially (no meat, alcohol, etc.)

Planning to fast completely for the final week

Planning to fast completely for the entire seven weeks

Questions used from Levada. *Church and State*. Russia: Levada, 2022.

LEVCelebrate – 1998, 1999, 2000, 2001, 2002, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016

Which of these holidays do you plan to celebrate? (n = 1600)

Orthodox Christmas, January 7

Questions used from Levada. *Memory and Pride*. Russia: Levada, 2020.

LEVPeople – 1999, 2003, 2008, 2012, 2015, 2016, 2017, 2018

What is the first thing that comes to mind when you think about your people? (n = 1600)

Our religion, the faith of my forefathers

LEVShame – 1999, 2003, 2008, 2012, 2015, 2017, 2018

What are you ashamed of? What causes you shame or upsets you when you reflect on Russian history in the 20th century? (n = 1600)

The persecution of the Church

Questions used from Levada. *The Soviet Union*. Russia: Levada, 2019.

LEVSoviet – 2000, 2019

What, in your opinion, is characteristic of the historical path of our country during the Soviet regime? (n = 1616)

Persecution of the Orthodox Church and believers

Questions used from Levada. *Religious Beliefs*. Russia: Levada, 2023b.

LEVBaptized – 2001, 2004, 2010, 2011, 2015, 2017, 2020

Are you baptized? (n = 1623)

Yes

LEVBelong – 2001, 20014, 2010, 2011, 2015, 2017, 2020

Do you belong to a religious group? If so, which one? (n = 1616)

Orthodoxy

LEVGodMothFath – 2009, 2014

Have you become a godmother/godfather to anyone? (n = 1623)

Yes

Questions used from Levada. *Church*. Russia: Levada, 2016.

LEVAdvant – 2003, 2007, 2012, 2013, 2016

Do you agree or disagree with the opinion that Orthodoxy Christians should have legal advantages over people of other faiths in Russia? (n = 1614)

Yes

Probably yes

LEVOfficials – 2005, 2007, 2012, 2013

Do you think that Russian officials should act based on religious convictions? (n = 1614)

Definitely yes

Probably yes

LEVDecision – 2005, 2007, 2012, 2013, 2017, 2018, 2020

Do you believe that church should influence government decision-making? (n = 1614)

Definitely yes

Probably yes

LEVKirill – 2012, 2013, 2014, 2015, 2016

Overall, do you approve or disapprove of the actions of the patriarch of the Russian Orthodox Church, Kirill? (n = 1614)

Approve

Cleaned Series Components – 72.75% Variance Explained

Questions used from Levada. *Religious Beliefs*. Russia: Levada, 2023a.
LEVBelong – 2001, 20014, 2010, 2011, 2015, 2017, 2020
Do you belong to a religious group? If so, which one? (n = 1616)
Orthodoxy

Questions used from Levada. *Attitudes to Religion*. Russia: Levada, 2020.
LEVLent – 1998, 2000, 2003, 2008, 2010, 2012, 2013, 2014, 2016, 2017, 2020
What are you planning to eat during lent? (n = 1614)
Planning to fast partially (no meat, alcohol, etc.)
Planning to fast completely for the final week
Planning to fast completely for the entire seven weeks

Questions used from Levada. *Religiosity*. Russia: Levada, 2022.
LEVSpells – 2010, 2012, 2015, 2017, 2020, 2021, 2022
Do you believe in bad eye, bad spells? (n = 1616)
I believe they exist
They probably exist

Questions used from Levada. *Attitudes to Religion*. Russia: Levada, 2020.
LEVInfluence – 1998, 2008, 2012, 2013, 2014, 2016
How much influence do you believe the church and other religious organizations exert on government policies in Russia? (n = 1614)
Exactly as much as should be
Somewhat less than is necessary
Not enough

APPENDIX B

Copyright for Table 6

License Details

This Agreement between Myla J. Burton ("You") and John Wiley and Sons ("John Wiley and Sons") consists of your license details and the terms and conditions provided by John Wiley and Sons and Copyright Clearance Center.

Print Copy

License Number	5817660028486
License date	Jun 28, 2024
Licensed Content Publisher	John Wiley and Sons
Licensed Content Publication	American Journal of Political Science
Licensed Content Title	Taking Time Seriously
Licensed Content Author	Luke Keele, Suzanna De Boef
Licensed Content Date	Jan 18, 2008
Licensed Content Volume	52
Licensed Content Issue	1
Licensed Content Pages	17
Type of Use	Dissertation/Thesis
Requestor type	Author of this Wiley article
Format	Print and electronic
Portion	Figure/table
Number of figures/tables	1
Will you be translating?	No
Title of new work	An Analysis of the Russian Public's Perception of the Relationship Between the Russian Orthodox Church and Russia's Military-Nuclear Complex
Institution name	Southern Illinois University
Expected presentation date	Jul 2024
Portions	Table 2
The Requesting Person / Organization to Appear on the License	Myla J. Burton
Requestor Location	Myla Burton 1207 South Wall Street 5 - 351 CARBONDALE, IL 62901 United States Attn: Southern Illinois University Carbondale
Publisher Tax ID	EU826007151
Total	**0.00 USD**

VITA

Graduate School
Southern Illinois University

Myla J. Burton

mylajburton@gmail.com

Southern Illinois University Carbondale
Bachelor of Arts, Political Science, August 2019

Southern Illinois University School of Law
Juris Doctorate, Law, May 2022

Research Paper Title:

The Russian Orthodox Church and Russia's Military Nuclear Complex: A Time Series Analysis

Major Professor: Dr. Joseph T. Grant