ARTICLE

Religion and Growth in Human Development in Post-Communist Countries during the Twenty-First Century

Kent T. Saunders
Anderson University (SC)

ABSTRACT: The rise and fall of the Soviet Union and the communist empire was one of the distinguishing events of the twentieth century. The 21 countries that made up the Warsaw Pact simultaneously made a transition from Communism to more market-based economic systems. These countries all shared a common economic system for a prolonged period of time. However, the countries varied and continue to vary dramatically in terms of size, language, and religious faith traditions. During the twenty-first century, all 21 countries have experienced growth in human development. This article seeks to identify whether the differing faith traditions played a significant role in the size of growth in human development (income, education, and life expectancy) for these countries.

KEYWORDS: Human Development Index, religion, former Soviet Union

INTRODUCTION

Based on his experience in the former Soviet Union, Childs (2012) "discovered that many young adults who grew up behind the Iron Curtain had the assumption that the American capitalist success was due in part to its Judeo-Christian values" (p. 93). Christian scholars recognized that the fall of the Soviet Union created both opportunities and perils in terms of spreading the Gospel. Rundle (2000) raised the profile of using business as a tentmaking strategy in the newly opened markets of the former Soviet Union. Mays (2010) considered some of the ethical dilemmas Christians face when dealing with entrenched structures embedded in the business culture of post-Soviet states. Iheanyi-Igwe and Veach (2019) advocated a business as mission approach to counteract secularization and specifically mentioned the religious resurgence after the fall of the Soviet Union as an example of counter secularization.

The fall of the Berlin Wall on November 9, 1989 signaled the beginning of the transition of the Communist economies of Eastern Europe toward more market-oriented economic systems. In 1991, the Soviet Union dissolved into 15 independent countries. In the aftermath of the dissolution, some countries sought to cut ties with Russia and create ties with Western Europe. For example, in 1991, Estonia, Latvia, and Lithuania created the Baltic Assembly, and all three joined the European Union in 2004. However, other countries sought to maintain political, economic, and military ties with one another and with Russia in particular. The Commonwealth of Independent States (CIS) was created in 1991, and by 1993, 12 of the 15 countries of the former Soviet Union were participating in the CIS. The level of integration, cooperation, and involvement with the CIS has varied and continues to vary by country. Currently, Turkmenistan is an associate member of the CIS, Georgia withdrew from membership in 2009 (O'Rourke, 2009), and Ukraine withdrew from membership in 2018 (Waller, 2018).

Eastern European countries outside of the Soviet Union that were a part of the Warsaw Pact went through a similar transition from communism to more market-oriented economies during the same period of time (i.e., 1989-1993). The Soviet "satellite" countries that were a part of the Warsaw Pact include Bulgaria, Czechia, Hungary, Poland, Romania, and Slovakia. All six of these countries are considered in this study. It should be noted that Czechia and Slovakia were a single country (Czechoslovakia) during the time of the Warsaw Pact and became separate countries in 1993. East Germany was a

member of the Warsaw Pact. However, East and West Germany merged into one country, and because of this merger, Germany is not included in this study.

Eastern European countries like Albania and current countries that were a part of Yugoslavia (Bosnia and Herzegovina, Croatia, Kosovo[1], Montenegro, North Macedonia, Serbia, and Slovenia) transitioned from communism to more market-based economies in a time frame similar to the dissolution of the Soviet Union. However, both Albania and Yugoslavia experienced splits with the Soviet Union prior to the 1989–1993 time period. Yugoslavia was never a part of the Warsaw Pact and began experimentation with market socialism as early as 1952 (European Bank for Reconstruction and Development, 1994, p. 20). Albania signed the Warsaw Pact initially but had a split with the Soviet Union in 1961 and formally withdrew from the Warsaw Pact in 1968. Albania and the countries that made up Yugoslavia are not considered in this study.

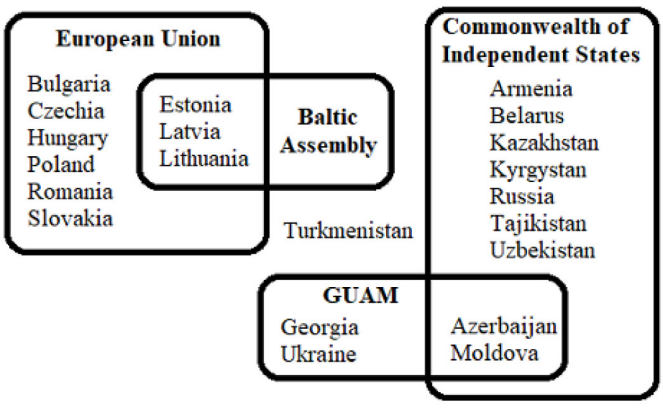
This study seeks to determine the effect of religion on human development for the 21 countries of the former Warsaw Pact after the fall of communism. Specifically, this study will examine development between 2000 and 2019. An overview of the 21 countries will be provided. Religious traditions will be examined. Literature on growth theory and religion will be reviewed to develop the model and variables for this study. Results and a conclusion will complete the study. The next section will provide an overview of 21 post-communist countries of the former Soviet Union and Eastern Europe.

TWENTY-ONE POST-COMMUNIST COUNTRIES

The 1990s were a turbulent time to transition from communist economic systems to market-oriented systems. Different countries "embarked on divergent paths of trade liberalization and various speeds of opening their economies" (Rosser & Rosser, 2018, p. 360). Virtually every economy in the world went into a recession in 1991, and Russia experienced an additional financial crisis in 1998. For the period between 1990 and 2000, 17 of the 21 countries in this study experienced a decline in per capita real gross domestic product (Feenstra et al., 2015). It should be noted that the size of the collapse is thought to be overstated due the degree of overstatement of actual production during communism (Åslund, 2001; Havrylyshyn et al., 2016). In effect, the 1990 values of per capita real gross domestic product are artificially high. Also, the size of the recovery may be understated due to the inability to recognize production in the underground economy (Åslund, 2001; Havrylyshyn et al., 2016). Nonetheless, Havrylyshy et al. (2016) found that former communist countries that conducted early and rapid reform in their transition to a more market-based economic system outperformed countries that adopted gradual reforms in terms of both per capita real gross domestic product and the Human Development Index.

Abdelal (2001) investigates the transitional paths for the countries of the former Soviet Union throughout the 1990s and identifies three groupings. One grouping is called "Toward Europe and the West" and is made up of Estonia, Latvia, and Lithuania. This grouping moved decisively away from Russia both politically and economically. Conversely, a second grouping is referred to as "Toward Russia and the East" and is made up of Belarus, Armenia, Kazakhstan, Tajikistan, Kyrgyzstan, and Russia. Finally, the third grouping is "Between East and West" and is made up of Azerbaijan, Georgia, Moldova, Turkmenistan, Uzbekistan, and Ukraine. This third grouping assumed ambivalent and/or contradictory roles with respect to its continuing relationship with Russia. In fact, Georgia, Ukraine, Azerbaijan, and Moldova founded the Organization for Democracy and Economic Development-GUAM in 1997. Uzbekistan joined GUAM in 1999 but withdrew in 2005 (GUAM, 2017). Certainly, the Warsaw Pact countries that were not a part of the Soviet Union would fall into the "Toward Europe and the West" category. Along with Estonia, Latvia, and Lithuania of the former Soviet Union, Czechia, Hungary, Poland, and Slovakia joined the European Union in 2004, and Bulgaria and Romania joined the European Union in 2007. Figure 1 presents a diagram outlining membership in several independent

Figure 1: Regional Organizations in 2020



and overlapping regional organizations in 2020 for the 21 former communist countries considered in this study.

Figure 2 displays a map of the post-communist countries of the former Soviet Union and Eastern Europe numbered in alphabetical order and shaded by primary religion. Light gray areas are bordering countries not included in this study and white areas are bodies of water. McCord & Sachs (2015) reported that physical geography plays an important role in economic development. Size is one of the distinguishing characteristics between the countries in this study. Russia (number 16) is visibly the largest country in terms of area. In fact, Russia is the largest country in the world in terms of total area. Armenia (number 1) and Moldova (number 13) are visibly the smallest countries in terms of area.

In addition to size, the 21 countries vary dramatically in terms of population, gross domestic product (GDP), language, and religion. Table 1 lists the total area, 2000 population, 2000 per capita GDP based on purchasing power parity (PPP) in constant 2017 international dollars, official language(s), and primary religion (and primary denomination) for the 21 countries. In terms of population in 2000, Russia had the most inhabitants (over 146 million), and Estonia had the fewest (just under 1.4 million). In terms of GDP in 2000, Czechia had the largest economic output with 25,045 and Tajikistan had the lowest with 1,252. Nineteen of the 21 countries have a unique official language. Moldova and Romania both have Romanian as their official language. Russian is a co-official language in three countries (Belarus, Kazakhstan, and Kyrgyzstan) in addition to serving as the sole official language in Russia. The most common primary religion for the 21 countries is Christianity. Thirteen of the 21 countries' primary religion is Christianity, six countries' primary religion is Islam, and two countries are non-religious (i.e., agnostic/atheist). In terms of the primary denomination within the primary religion, eight countries' primary denomination is Orthodox Christian (Armenia, Belarus, Bulgaria, Georgia, Moldova, Romania, Russia, and Ukraine), five countries' primary denomination is Sunni Muslim (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan), four countries' primary denomination is Catholic Christian (Hungary, Lithuania, Poland, and Slovakia), two countries are primarily non-religious (Czechia and Estonia), one country is primarily Shia Muslim (Azerbaijan), and one country is primarily Protestant Christian (Latvia).

RELIGIOUS TRADITIONS

Throughout the twentieth century, inspired by Marxist-Leninist atheism, the Soviet system sought to eliminate organized religion (Froese, 2008). However, Inglehart and Baker (2000) note that though the Soviet Union was officially atheist, there were a wide variety of

Figure 2: Post–Communist Countries and Primary Religion

1. Armenia
2. Azerbaijan
3. Belarus
4. Bulgaria
5. Czechia
6. Estonia
7. Georgia
8. Hungary
9. Kazakhstan
10. Kyrgyzstan
11. Latvia
12. Lithuania
13. Moldova
14. Poland
15. Romania
16. Russia
17. Slovakia
18. Tajikistan
19. Turkmenistan
20. Ukraine
21. Uzbekistan

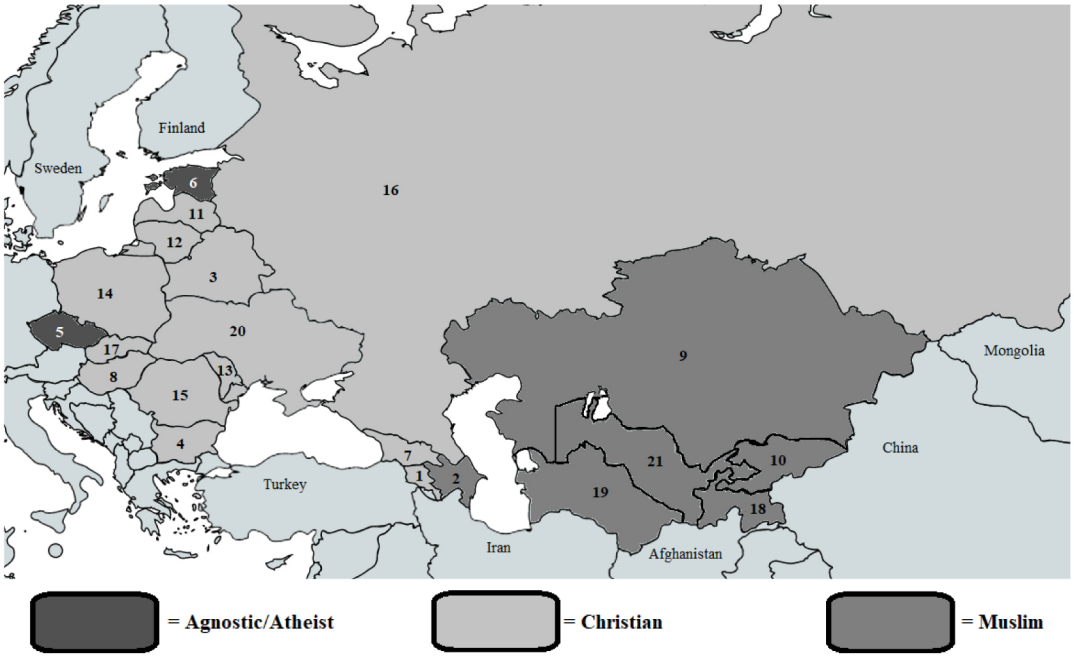


Table 1: Characteristics of the Post-Communist Countries

Country	Total Area (000 km2)	2000 Population	2000 Per Capita GDP (2017 IS PPP)	Official Language(s)	Primary Religion (Primary Denomination)
Armenia	29.7	3,069,591	4,048	Armenian	Christian (Orthodox)
Azerbaijan	86.6	8,048,600	4,063	Azerbaijani	Muslim (Shia)
Belarus	207.6	9,979,610	8,053	Russian, Belarusian	Christian (Orthodox)
Bulgaria	110.9	8,170,172	10,194	Bulgarian	Christian (Orthodox)
Czechia	78.9	10,255,063	25,045	Czech	Agnostic/Atheist
Estonia	45.2	1,396,985	17,809	Estonian	Agnostic/Atheist
Georgia	69.7	4,077,131	4,919	Georgian	Christian (Orthodox)
Hungary	93.0	10,210,971	19,547	Hungarian	Christian (Catholic)
Kazakhstan	2,724.9	14,883,626	10,276	Russian, Kazakh	Muslim (Sunni)
Kyrgyzstan	199.9	4,898,400	3,079	Kyrgyz, Russian	Muslim (Sunni)
Latvia	64.6	2,367,550	12,855	Latvian	Christian (Protestant)
Lithuania	65.3	3,499,536	13,902	Lithuanian	Christian (Catholic)
Moldova	33.9	2,923,783	5,074	Romanian	Christian (Orthodox)
Poland	312.7	38,258,629	16,225	Polish	Christian (Catholic)
Romania	238.4	22,442,971	12,072	Romanian	Christian (Orthodox)
Russia	17,098.2	146,596,557	14,615	Russian	Christian (Orthodox)
Slovakia	49.0	5,388,720	16,086	Slovak	Christian (Catholic)
Tajikistan	144.1	6,216,341	1,252	Tajik	Muslim (Sunni)
Turkmenistan	488.1	4,516,133	4,622	Turkmen	Muslim (Sunni)
Ukraine	603.6	49,175,848	7,221	Ukrainian	Christian (Orthodox)
Uzbekistan	447.4	24,650,400	2,786	Uzbek	Muslim (Sunni)
Source:	CIA (2020)	World Bank (2020)		CIA (2020)	Johnson & Grimm (2020)

faith traditions represented in its population, including Orthodox, Protestant, Catholic, Islam, Buddhism, and Judaism. Rosser and Rosser (2018) note that about "one-third of the population actively practiced their faith" under communism (p. 294). Greeley (1994) reported that "antireligious Socialism failed completely to crush out the Russian religious heritage" (p. 272).

The World Religion Database (Johnson & Grim, 2020) contains detailed statistics and projections on religious affiliation for every country of the world for the period 1900 to 2050. Table 2 documents the religious affiliations by percentage from 1900 to 2020 for each of the 21 countries and in aggregate. All 21 countries had a sizeable majority faith tradition in 1900 with 15 countries primarily Christian and six countries primarily Muslim. The Christian percentages in 1900 ranged from a low of 82% in Bulgaria to a high of 100% (rounded) in Lithuania. The Muslim percentages in 1900 ranged from a low of 89% in Azerbaijan to a high of 98% in Tajikistan, Turkmenistan, and Uzbekistan. On average, 94% followed their country's primary religion in 1900.

The changes from 1900 to 1970 documented in Table 2 indicate the effect communism had on religious affiliation. The percentage of agnostic/atheist individuals increased in all 21 countries from virtually 0% in 1900 to an average of 37% in 1970. The minimum increase was 10% in Poland, and the maximum increase was 61% in Armenia.

In the years preceding, and certainly after, the dissolution of the Soviet Union, there was widespread interest in reconnecting with religious practices and a religious "free market" developed in the early 1990s. Multiple studies document the post-communist religious revival (Evans & Northmore-Ball, 2012; Müller, 2011; Sarkissian, 2009; Tomka, 2011). Miazhevich (2012) found that "Belarus, together with other nations in the former Soviet Union, witnessed an immediate revival of the religious practices suppressed during Soviet times" (pp. 344-45). A general movement back toward the historical faith tradition is noticeable in 17 of the 21 countries in 2000 and 2020, relative to 1970. The percentage of agnostic/atheist and primary religion remained relatively stable in Hungary and Slovakia from 1970 to 2020. In Czechia and Estonia, the percentage of agnostic/atheist continued to climb from 1970 through 2020 to the point that both Czechia (64% agnostic/atheist in 2020) and Estonia (63% agnostic/atheist in 2020) are now majority non-religious countries. Other countries that maintain double digit percentages of agnostic/atheist in 2020 are Belarus (21%), Hungary (12%), Latvia (17%), Lithuania (10%), Slovakia (15%) and Ukraine (12%). Capturing historical culture and the communist influence, twenty-first century Belarusian President Lukashenko is commonly referred to as an "Orthodox atheist."

Table 2: Primary Religion by Country across Time

Country	Primary Religion	1900	1970	2000	2020
Armenia	Christian	89%	34%	89%	94%
	Agnostic/Atheist	0%	61%	9%	4%
Azerbaijan	Muslim	89%	61%	93%	96%
	Agnostic/Atheist	0%	34%	4%	1%
Belarus	Christian	87%	58%	70%	79%
	Agnostic/Atheist	0%	40%	30%	21%
Bulgaria	Christian	82%	67%	84%	83%
	Agnostic/Atheist	0%	22%	4%	3%
Czechia	Christian	97%	81%	41%	35%
	Agnostic/Atheist	0%	19%	59%	64%
Estonia	Christian	98%	45%	39%	36%
	Agnostic/Atheist	0%	54%	61%	63%
Georgia	Christian	92%	35%	85%	86%
	Agnostic/Atheist	0%	53%	4%	3%
Hungary	Christian	94%	85%	87%	87%
	Agnostic/Atheist	0%	14%	12%	12%
Kazakhstan	Muslim	94%	27%	55%	71%
	Agnostic/Atheist	0%	54%	17%	3%
Kyrgyzstan	Muslim	96%	34%	78%	87%
	Agnostic/Atheist	0%	53%	12%	7%
Latvia	Christian	99%	39%	57%	82%
	Agnostic/Atheist	0%	60%	42%	17%
Lithuania	Christian	100%	71%	87%	89%
	Agnostic/Atheist	0%	29%	12%	10%
Moldova	Christian	99%	46%	96%	97%
	Agnostic/Atheist	0%	52%	3%	2%
Poland	Christian	91%	90%	96%	96%
	Agnostic/Atheist	0%	10%	4%	4%
Romania	Christian	94%	83%	98%	99%
	Agnostic/Atheist	0%	15%	1%	1%
Russia	Christian	85%	38%	71%	82%
	Agnostic/Atheist	0%	52%	17%	4%
Slovakia	Christian	96%	86%	84%	85%
	Agnostic/Atheist	0%	14%	16%	15%
Tajikistan	Muslim	98%	63%	94%	98%
	Agnostic/Atheist	0%	34%	4%	1%
Turkmenistan	Muslim	98%	60%	93%	97%
	Agnostic/Atheist	0%	35%	5%	2%
Ukraine	Christian	97%	60%	80%	86%
	Agnostic/Atheist	0%	38%	18%	12%
Uzbekistan	Muslim	98%	50%	91%	96%
	Agnostic/Atheist	0%	41%	7%	3%
Average	**Primary Religion**	**94%**	**58%**	**79%**	**84%**
	Agnostic/Atheist	**0%**	**37%**	**16%**	**12%**

GROWTH THEORY AND RELIGION

Culture has a significant impact on economic development, and religious history has an important impact on culture. Inglehart and Baker (2000) conclude that "the fact that a society was historically shaped by Protestantism or Confucianism or Islam leaves a cultural heritage with enduring effects that influence subsequent development" (p. 49). Certain religions seem to enable the development of institutions that lead to economic growth. Weber (1930) opined that religious practices and beliefs have enduring influence on society, and should produce economic consequences. Specifically, Weber believed that the Protestant work ethic was a driving force for the economic prosperity of primarily Protestant nations relative to primarily Catholic nations. Inspired by Weber, several studies considered the effect of religious adherence on economic performance. Becker and Woessmann (2009) studied Prussia in the late nineteenth century and found that Protestants' increased literacy, inspired by Luther's desire for everyone to be able to read the Bible, led to the human capital necessary for economic growth. Vander Plaats (2009) was unable to find a significant difference in economic growth between the Protestant and Catholic expressions of the Christian faith among "Western" nations during the period of 1954–2003, when controlling for other factors affecting economic growth. More recently, Portilla (2019) studied the relationship between religious systems and prosperity and found that institutional "factors that are related to religion exert a stronger structural and long-term influence on prosperity (competitiveness) than the cultural influence of religion (adherents)" (p. 33).

Chilton and Neusner (2009) document the universality of the golden rule (i.e., treating others how you would like to be treated) across religious faith traditions. To the extent that serving and caring for others is a good business practice, it would stand to reason that countries with strong religious faith traditions should become prosperous and grow. Guiso et al. (2003) find that religious beliefs are associated with attitudes conducive to economic growth. Further, they held that Christian religions are positively associated with attitudes conducive to economic growth, and Islam is negatively associated. Kuran (2004) argued that "certain economic institutions of classical Islamic civilization interacted in unintended and unanticipated ways to block adaptations now recognized as critical to economic modernization" (p. 78). Guiso et al. (2003) note that it could be the political and legal institutions developed in the Islamic world, rather than the religion itself, that is the cause of the underdevelopment of many Islamic countries. Bénabou et al. (2015) found the relationship between religiosity (identifying as a religious person, belief in God, importance of religion, importance of God, and church attendance) and openness to innovation (attitudes toward science and technology, new ideas, change, and risk-taking) to be robustly negative. Bartke and Schwarze

(2008) found that religious persons are more risk averse, with Muslims being more risk averse than Christians. The implication is that countries with strong religious faith traditions could be less open to the types of innovations and risk-taking that lead to economic growth. If true, high levels of adherence to faith by a country's citizens would be negatively related to economic growth.

Previous studies have examined the effect of religiosity on economic growth (McCleary & Barro, 2006a) and also studied the effect of economic growth on religiosity (Hirschle, 2013; (McCleary & Barro, 2006b). This study will examine the effect of religious adherence on growth in human development and its subcomponent measures (income, education, and life expectancy) for the countries that made up the former Warsaw Pact for the period 2000 to 2019. The next section will introduce the model and describe the independent variables.

MODEL AND VARIABLES

The Human Development Index (HDI) is a composite measure of life expectancy, education, and income (United Nations Development Programme, 2020). The HDI will be the primary dependent variable in this study. However, each of the three subcomponents (life expectancy, education index, and income index) will also be used as dependent variables. Life expectancy is based on the life expectancy at birth for a given year. The education index is composed of the average years of schooling for adults along with the expected years of schooling for children entering school. The income index is based on the logarithm of gross national income per capita at purchasing power parity. Purchasing power parity is used to account for the differences in prices between countries.

Four general linear models will be estimated with data spanning two intervals: 2000 to 2010 and 2010 to 2019. In the spirit of parsimoniousness, due to the relatively small sample of countries[2], only two time intervals, multicollinearity concerns, and the desire to avoid overfitting the data, the regression models will use three independent variables to explain the dependent variables. Using a methodology similar to Barro (1991,) Barro and McCleary (2003), and McCleary and Barro (2006a), the general form for the regression model is as follows: percent change in the dependent variable over the interval = β_0 + β_1(starting level of the dependent variable at the beginning of the interval) + β_2(investment) + β_3(religious adherence).

Neoclassical growth models (Solow, 1956) predict convergence in economic output per capita between countries. That is, countries with low economic output per capita should grow faster than countries with high economic output per capita. Economic growth should be negatively related to the initial level of economic output. Analogously, the expected sign for β_1 is negative based on the idea of convergence from neoclassical growth models.

Endogenous growth models (Romer, 1990) assume that growth occurs from factors internal to a given economy. For the models in this study, the internal factor will be investment. Investment will be measured with the average share of gross capital formation during each interval from the Penn World Table (Feenstra, Inklaar & Timmer et al., 2015). The expected sign for β_2 is positive based on endogenous growth theory. Additional endogenous variables are excluded from this study due to lack of availability for the entire sample of countries and/or the high degree of correlation with the starting level of the dependent variables. For example, human capital (typically a measure of education) is normally used as an independent variable in economic growth models. However, since the education index is one of the dependent variables in this study and embedded in the HDI, a human capital variable is not included as an independent variable in this study.

For the countries in this study there are two primary religions: Christianity and Islam. This study will not use simple dummy variables to indicate primary religion since there are varying percentages of adherents to the primary religion in any given country. Rather, the percentage of adherents at the beginning of the interval from the World Religion Database (Johnson & Grim, 2020) will be used. Christian% will represent the percentage of adherents to the Christian faith. Muslim% will represent the percentage of adherents to the Islamic faith. C%–M% is a combined variable that takes Christian% and subtracts Muslim%. A positive value for C%–M% would indicate a primarily Christian country. A negative value for C%–M% would indicate a primarily Muslim country. Based on Guiso et al. (2003), Bartke and Schwarze (2008) and Bénabou et al. (2015), the expected sign for β_3 should be positive for Christian% and C%–M% and negative for Muslim%.

RESULTS

Generally accepted levels of multicollinearity have bivariate correlations below 0.7 and VIF values below

Table 3: Correlation Matrix of Dependent and Independent Variables

	HDI	Income Index	Education Index	Life Expectancy	Investment	Christian%	Muslim%	C%-M%
HDI	1.00							
Income Index	0.96	1.00						
Education Index	0.91	0.80	1.00					
Life Expectancy	0.83	0.71	0.69	1.00				
Investment	0.60	0.63	0.44	0.45	1.00			
Christian%	0.50	0.51	0.40	0.49	0.11	1.00		
Muslim%	-0.68	-0.67	-0.59	-0.61	-0.36	-0.90	1.00	
C%-M%	0.61	0.51	0.51	0.56	0.25	0.97	-0.98	1.00

10 (Hair et al., 2019, pp. 316-320). Table 4 reports the Pearson's correlation coefficients between the independent variables. The four starting levels of the dependent variables (HDI, income index, education index, and life expectancy) are in the upper left corner. These four variables are all highly correlated with one another. Only one starting level variable will be used per model. The three different measures for religious adherence are in the lower right corner. Due to the extremely high correlation between these variables, the adherence variables will be reported one at a time. That is, both Christian% and Muslim% will not be included in a model simultaneously due to multicollinearity concerns. C%–M% is used to measure the effect of both religious adherence variables with a single independent variable.

Table 5 reports the regression results for the four models in this study. Though not reported in the tables, all the VIF values are well below 10 with the highest VIF value being 2.6. The regression results can be interpreted under the assumption that multicollinearity is not a cause for concern. The significance level (type I error) for this study is 5% with special notation of factors that have a significance level below 1%.

Religious adherence has a statistically significant effect in the overall HDI model, the income index model, and education index model. Christian% has a statistically significant positive coefficient estimate in the HDI and the income index models. C%–M% has a statistically significant positive coefficient estimate in the HDI, income index, and education index models. Muslim% has a statistically significant negative coefficient estimate in the HDI, income index, and education index models. Varying conceptions of gender roles may be one of the driving forces for these differences in the indices. Further study of this possibility is a suggested area for future research. The regression analysis provides no evidence that religious adherence has any effect on life expectancy.

With reference to the magnitude of the adherence effect, the growth in HDI would be between 2% to 4% higher for a country with 100% Christian adherence and 0% Muslim adherence compared to a country with 0% Christian adherence and 100% Muslim adherence. Similarly, the growth in the income index would be 3% to 6% higher and the growth in the education index would be 3% to 8% higher.

In terms of overall fit, the income index model has the highest adjusted R^2 values. This result makes sense in that the endogenous variable of investment is generally considered a primary driver of economic growth and less directly related to education and life expectancy. The coefficient estimate for investment is consistently positive and statistically significant for growth in the HDI and the income index. The coefficient estimates for the starting level of the HDI, income index, education index, and life expectancy index are consistently negative and statistically significant.

A possible contributor to the significance of adherence to Christianity with respect to the "Growth in Income Index" is the differing positions on interest and lending between Islam and Christianity. Interest and lending are instrumental in the capital formation process and serve as one of the primary drivers of economic growth. Dunn and Galloway (2011) report that the "great majority of Islamic scholars accept that interest at any level is prohibited" (p. 55). Similarly, Beed and Beed (2014) note that both the Old and New Testament teach

Table 4: Regression Results

Growth in Human Development Index			
R^2	.60	.64	.62
Adj. R^2	.57	.61	.59
Obs.	40	40	40
	Coeff. (p)	Coeff. (p)	Coeff. (p)
Intercept	.38 (.00)**	.45 (.00)**	.41 (.00)**
HDI	-.52 (.00)**	-.57 (.00)**	-.55 (.00)**
Investment	.32 (.00)**	.28 (.00)**	.30 (.00)**
Christian%	.03 (.02)*	---	---
Muslim%	---	-.04 (.00)**	---
C%-M%	---	---	.02 (.00)**

Growth in Income Index			
R^2	.71	.68	.70
Adj. R^2	.69	.66	.67
Obs.	41	41	41
	Coeff. (p)	Coeff. (p)	Coeff. (p)
Intercept	.43 (.00)**	.47 (.00)**	.46 (.00)**
Income Index	-.70 (.00)**	-.68 (.00)**	-.70 (.00)**
Investment	.68 (.00)**	.60 (.00)**	.64 (.00)**
Christian%	.06 (.00)**	---	---
Muslim%	---	-.04 (.04)*	---
C%-M%	---	---	.03 (.01)*

Growth in Education Index			
R^2	.34	.44	.39
Adj. R^2	.28	.39	.34
Obs.	40	40	40
	Coeff. (p)	Coeff. (p)	Coeff. (p)
Intercept	.39 (.00)**	.54 (.00)**	.46 (.00)**
Educ. Index	-.55 (.00)**	-.66 (.00)**	-.61 (.00)**
Investment	.31 (.04)*	.21 (.12)	.27 (.05)
Christian%	.05 (.06)	---	---
Muslim%	---	-.08 (.00)**	---
C%-M%	---	---	.03 (.01)*

Growth in Life Expectancy Index			
R^2	.37	.37	.37
Adj. R^2	.32	.32	.32
Obs.	41	41	41
	Coeff. (p)	Coeff. (p)	Coeff. (p)
Intercept	.28 (.00)**	.31 (.00)**	.29 (.00)**
Life Exp. Index	-.30 (.00)**	-.33 (.00)**	-.32 (.00)**
Investment	.06 (.39)	.06 (.39)	.06 (.35)
Christian%	-.00 (.69)	---	---
Muslim%	---	-.01 (.66)	---
C%-M%	---	---	.00 (.99)

** Significant at the 1% level * Significant at the 5% level

that a Christian should avoid the use of debt and charging interest. However, Saunders (2017) describes the evolution of (primarily Western) Christian thought as it relates to easing the restrictions on the prohibition of interest. For better or worse, countries that are primarily Christian are more open to the use of interest and lending as a tool of investment and economic growth (Bloomberg, 2012; Eaton, 2013; Meeks, 2011; Valeri, 2011).

CONCLUSION

The rise and fall of the Soviet Union and its communist system was one of the distinguishing events of the twentieth century. This study considered the effect of religion on growth in human development (income, education, life expectancy) for the 21 countries of the former Warsaw Pact during the twenty-first century. Christian religious adherence was shown to have a positive and statistically significant effect on growth in the overall HDI, income index, and education index. It is important to note the limitations of the results of the analysis. Although statistically significant, religious adherence is not the primary factor of growth in these indices.

Suggestions for future research are abundant. First, the Pew Research Center (2016a, 2016b, 2017) provides data on the ways that national and local governments restrict religion and ways private individuals and social groups infringe on religious beliefs. Studying the effects of these restrictions on growth in human development may be revealing. Second, The World Values Survey (Inglehart et al., 2020) is a global network of social scientists studying values over time. These nationally representative surveys have been conducted in seven different waves in

120 countries from 1981-2020. Integrating this opinion survey data from this period of transformational change with the economic data for these specific countries may be intriguing. Third, it would be interesting to study the influence of gender on income and education in the countries in this study. One possible approach could be to apply a methodology similar to Beck (2018) to the countries in this study. A fourth suggestion is to study the affect of religious denominations rather than combining the Christian denominations (Protestant, Catholic and Orthodox) and Muslim denominations (Sunni and Shia) together. Winiecki (2004) proposed that a distinguishing feature of the post-communist countries that made successful transitions was the pre-communist influence between Eastern (Orthodox) and Western (Catholic, Protestant) Christendom. Perhaps drilling down within country specific regional data would allow for an adequate sample size to conduct such a comparison. Fifth, one could investigate if religion is taught in public schools as another measure of religiosity. Finally, one could investigate migration patterns over time. The entry or exit of human capital to or from a country could influence macroeconomics variables.

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FOOTNOTES

[1] The independence of Kosovo is not universally recognized.

[2] Turkmenistan does not have data for the HDI or Education Index for the first interval.

ABOUT THE AUTHOR

Kent T. Saunders is a professor of finance and economics at Anderson University in South Carolina. He earned a BS from Ball State University with a major in mathematical economics, an MA in economics from Clemson University, and a PhD from Clemson University in applied economics. Dr. Saunders's research interests are teaching pedagogy, investments, and economic growth in the countries of the former Soviet Union. Kent has been married to his wife, Chrissie, since 1991, and together they have three grown children.