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Why Are Muslim Countries Underdeveloped? A System GMM Approach

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ABSTRACT

Many authors argue that Islam is anti-growth. The performance of Muslim countries in various economic, social, and political indicators support such hypothesis. This paper argues that Muslim countries are underdeveloped not due to Islam, but due to the engagement of its individuals and institutions in development hindering behavior. To test this hypothesis, a dynamic panel data model applying a System Generalized Method of Moments approach (Sys-GMM) is utilized to test the relationship between a country's level of development, represented by the Human Development Index (HDI), and several development hindering behavior measures represented by restricting economic freedoms, rentierism, political instability, social dissension, and poor knowledge creation. The dataset has a time series of 13 years (2007-2019), for 151 countries, of which 49 are Muslim countries. The study finds a negative and significant relationship between human development (DV), restricting economic freedoms, political instability, social dissension, and poor knowledge creation (IV's). Although the study provides insight as to why Muslim countries are underdeveloped, it falls short in addressing whether Islam is anti-growth. A better approach is to utilize an inductive methodology which relies on theory and literature as well as a deductive methodology which seeks to study the religion itself for any principles which are pro or anti-development.

ملخص

يجادل العديد من المؤلفين بأن الإسلام مناهض للنمو. ويدعم أداء الدول الإسلامية في مختلف المؤشرات الاقتصادية والاجتماعية والسياسية هذه الفرضية.وهذه الورقة البحثية تجادل بأن الدول الإسلامية متخلفة ليس بسبب الإسلام، ولكن بسبب مشاركة أفرادها ومؤسساتها في سلوكيات تعيق

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التنمية. ولاختبار هذه الفرضية، استخدم نموذج بيانات لوحة ديناميكي يطبق منهج نظام أسلوب اللحظات المعمم (Sys-GMM) لاختبار العلاقة بين مستوى تنمية الدولة، الذي يمثله مؤشر التنمية البشرية ((HDI، وعدد من إجراءات السلوكيات المعيقة للتنمية المتمثلة في تقييد الحريات الاقتصادية، والريعية، وعدم الاستقرار السياسي، والخلافات الاجتماعية، وضعف مستوى توليد المعرفة. وتتوفر مجموعة البيانات على سلسلة زمنية من 13 عاما (2007-2019)، لمجموع 151 دولة، منها 49 دولة إسلامية. وتوصلت الدراسة إلى علاقة سلبية وهامة بين التنمية البشرية (DV)، وتقييد الحريات الاقتصادية، وعدم الاستقرار السياسي، والخلافات الاجتماعية، وضعف مستوى توليد المعرفة (IV's). وعلى الرغم من أن الدراسة تقدم صورة عامة حول سبب تخلف البلدان الإسلامية، إلا أنها تعجز عن تناول مسألة ما إذا كان الإسلام مناهضا للنمو. ويتمثل أفضل نهج في استخدام منهجية استقرائية تعتمد على النظريات والأدبيات وكذلك منهجية استنتاجية تسعى إلى دراسة الدين نفسه فيما يتعلق بأي مبادئ مؤيدة أو معادية للتنمية.

ABSTRAITE

Many authors argue that Islam is anti-growth. The performance of Muslim countries in various economic, social, and political indicators support such hypothesis. This paper argues that Muslim countries are underdeveloped not due to Islam, but due to the engagement of its individuals and institutions in development hindering behavior. To test this hypothesis, a dynamic panel data model applying a System Generalized Method of Moments approach (Sys-GMM) is utilized to test the relationship between a country's level of development, represented by the Human Development Index (HDI), and several development hindering behavior measures represented by restricting economic freedoms, rentierism, political instability, social dissension, and poor knowledge creation. The dataset has a time series of 13 years (2007-2019), for 151 countries, of which 49 are Muslim countries. The study finds a negative and significant relationship between human development (DV), restricting economic freedoms, political instability, social dissension, and poor knowledge creation (IV's). Although the study provides insight as to why Muslim countries are underdeveloped, it falls short in addressing whether Islam is anti-growth. A better approach is to utilize an inductive methodology which relies on theory and literature as well as a deductive methodology which seeks to study the religion itself for any principles which are pro or anti-development.

Keywords: Islam; Development; Regression Analysis; GMM; System GMM.

JEL classification: C33; O1; Z12.

Islam has been blamed by various studies for the poor development of Muslim countries. These studies fail however to differentiate between Islam as a religion, and the behavior of the Muslim population.

One such measure of development to quantitatively compare Muslim and Non-Muslim countries is the Human Development Index (HDI). Many authors posit that the current definition of human development is too narrow and is not a true reflection of reality (Kelley, 1991; McGillivray, 1991; Lind, 1992; Dasgupta et al., 1992; Murray, 1993; Srinivasan, 1994; Sagar et al., 1998; Todaro et al., 2006; Chhibber et al. 2007; Klugman et al., 2011). That said, it is the most widely accepted measure of a country's well-being, and it provides a quantitative benchmark for cross-country comparisons.

The HDI ranks countries based on income per capita, life expectancy at birth, and expected years of schooling (UNDP, 2019). Analyzing the performance of Muslim countries in the HDI, with an average HDI score of 0.65, shows that they are performing poorly relative to the Organisation for Economic Co-operation and Development (OECD) countries score of 0.9, and rest of the world averages of 0.737 (UNDP, 2019). One possible hypothesis as to why Muslim countries are underdeveloped is that Islam hinders development, a position endorsed by Barro & McCleary (2003), Guiso (2003), Kuran (2004), and Lewis (2002), among others. Another possible hypothesis is that Muslim's and their country's various institutions are simply engaging in development hindering behavior.

The purpose of this study is to examine the latter hypothesis. This involves identifying from theory and literature the various behaviors which are detrimental to development and develop an empirical model which examines the relationship between such behaviors and the HDI.

According to literature, various factors impact development, including but not limited to: restricting economic freedoms (Scully, 1992; Doucouliagos et al., 2006; Gezer, 2020); the absence of inclusive institutions (Robinson et al.; 2012); monopolistic markets (Bae et al., 2021); high dependence on external rent (Auty, 1995); high unemployment rate (Priambodo, 2021); low savings as a % of GDP (Krieckhaus, 2002); a high inflation rate (Akinsola et al., 2017; Yolanda, 2017); poor infrastructure (Kusharjanto et al., 2011; Mohanty et al., 2016); high money laundry incidence (Kumar, 2012; Šikman et al., 2021);

high levels of public sector corruption (Mo, 2001; Akçay, 2006; Popova et al., 2014); high levels of political instability (Alesina et al., 1996; Uddin et al., 2017); poor application of the rule of law (Rodrik et al., 2004); low levels of social cohesion (Max Weber, 1958; Ibn Khuldon et al., 1967; Fukuyama, 2001; Iyer et al., 2005); poor knowledge creation & innovation (Romer, 1994; Solarin et al., 2016; Pinto et al., 2020); among others.

With that said, this paper raises the follow questions: 'why are Muslim countries underdeveloped?' Is it due to restricting economic freedoms? Is it due to highly monopolistic markets? Is it due to high dependence on external rent? Is it due to high levels of political instability? Or is it due to high levels of public sector corruption? etc. Developing a model which includes all the aforementioned variables will lead to an overidentified model which has a poor estimation ability. As such, a better approach is to develop a model which includes the variables which have the most impact on development, according to theory and literature, whilst also making sure not to include variables which have high levels of correlation & multicollinearity. The methodology section elaborates upon the chosen variables and provides a justification for their selection.

1. Literature Review

Numerous studies examine the influence of Islam on measures such as economic growth, modernization, intellectual development etc. The earliest of such is Weber's commentary on how Islam's 'warlike' mentality is the main reason why Islamic states have failed to achieve the success brought upon by capitalism (Djedi, 2011). Furthermore, Weber did not believe that Islamic states can replicate the success of protestant capitalist states due to not being compatible with capitalism (Kaminski, 2016). Grief (1994) raises the question "why do societies fail to adopt the institutional structure of more economically successful ones?" in his study on individual vs. collectivist cultures and their relation to development. The author finds that Jewish Maghrabi traders who assimilated the values of Muslim society exhibited collectivist traits relative to the Latin Genoese traders who exhibited individualist beliefs. The author argues that societies with individualist cultural beliefs promote development relative to the societies with collectivist cultural beliefs, i.e., Muslim societies. That said, Ciftci (2022) disagrees with Greif (1994) and argues that devout Muslims are likely to engage in economically individualistic

behavior as well, and that Islam does not increase the likelihood of collective behavior. Bernard Lewis (2002) on the other hand blames Islam for the lack of development in the Arab world due to the dogmatic nature of the religion. Barro et al. (2003) utilize a cross-country growth regression methodology to investigate the effects of church attendance & religious beliefs on economic growth. The authors finds that Islam is negatively associated with economic growth. Basedau et al. (2018) addresses the limitations of this paper stating that authors "do not provide a clear definition of different dimensions of Religion". Another limitation pertains to the issue of endogeneity and failing to distinguish between Islam and the Muslim population. Another empirical study is that by Guiso et al. (2003), who utilize Ordinary Least Squares (OLS) regression to test the relationship between various religions and several variables which are attributable to people's attitudes towards "trust and cooperation, women, the government, the law, the market and its fairness, and thriftiness" (Ibid, 2003). Regarding Islam, the authors find that Islam is negatively associated "with attitudes that are conducive to growth" and, among adherents to the world's major religions, Muslims as being the most "antimarket" (Ibid, 2003). Similar to Barro et al. (2003), the authors fail to distinguish between the actions of Muslims and the teachings of Islam. Kuran (2004) argues that Islamic legal principles such as usury-prohibition, Islamic trusts, inheritance system et al. inhibit economic development. Mangeloja (2005) echoes the views of Grief (1994) and Kuran (1997a, 1997b) in stating that Christian religion promotes growth relative to Islam. The reason given for that is due to "Islam's static worldview" (Ibid, 2005). Lastly, Khalfaoui et al. (2021) study the impact of the moral and cultural values of Islam on the economic growth and development of 17 Muslim countries – 12 of which are Arab, and 5 are non-Arab. The authors utilize an Autoregressive Distributed Lag (ARDL) panel data model with a time series of 30 years (1990-2019). The authors find a negative relationship between Islam and economic growth for Muslim Arab countries, and a positive relationship for the non-Arab countries. The authors attribute the contrasting findings to "Social conditions, cultural heritage and race" (Ibid, 2021). The authors conclude their paper by stating that the literature on the relationship between Islam and economic growth is far and in between due to the sensitive nature of the topic, and due to the divisive and inconclusive findings.

Some of the literature which defend Islam include but is not limited to Rodinson (1974), who argues that Muslim countries are underdeveloped

not due to Islam, but rather due to "various external political and economic struggles that ultimately left the Muslim world outside the fold of capitalist development". Noland (2005) does not support the claims that Islam inhibits growth, stating that "virtually every statistically significant coefficient on Muslim population shares reported in this paper—in both cross-country and within-country statistical analyses — is positive. If anything, Islam promotes growth." (Ibid, 2005). Platteau, (2008) argues that Islam has been manipulated by political actors, referring to it as the "Instrumentalization of Islam". Chapra (2008) suggests that Islamic civilizations of the past did not decline because Islam was anti-development, but rather due to internal and external factors such as "moral degeneration", "loss of dynamism after the rise of dogmatism and rigidity"; "decline in intellectual and scientific activity"; "internal revolts and disunity" etc., which lead to wars which consequently weakened the economy. Crocco et al. (2009) address the association of Islam with anti-development by stating that it is due to not truly understanding Islam and associating its teachings with that of the "actions of the faith's followers". Megahed et al. (2010) discuss the on-going debate on what can be attributed to Islam, and what can be attributed to variables such culture and social norms. The authors brings attention to how the introduction of Islam lead to a new dawn of knowledge, where "educational traditions of the ancient world thrived"… "the Arab world introduced Algebra, the concept of zero and the decimal system"… "As medieval Europe slipped into intellectual stagnation"… and how "Arab scholars preserved the classical knowledge of Ancient Greece, Persia and India". Karaçuka (2018) deflects the blame from Islam and onto institutions, arguing that the poor development of Muslim countries is attributable to inflexible political and legal institutions which seek to preserve the status quo. Similar to Chapra (2008), Sidani (2019) states that the poor development of Muslim countries is a multidimensional problem which can be attributed to internal, external, and historical causes, adding that the focus should be on internal factors which require "a process of self-examination".

In summary, there are various opposing views as to whether Islam is detrimental to development. Those blaming Islam point to the poor development of Muslim countries, whilst those defending Islam point to internal and external factors such as war, poverty, political instability etc. Regarding the shortcomings of the literature reviewed, the authors fail differentiate between Islam as a religion, and the behavior of its

constituents. This is primarily due to the adoption of an inductive approach based on theory and observations, and the abandonment of a deductive approach which seeks to study the religion itself and whether it promotes behavior which hinders development. Pryor (2007) champions the use of a deductive approach, but himself forgoes the application of such approach stating that "it runs the risk that the institutions of Muslim countries and the behavior of its citizens may be only weakly related to the presumptive religious doctrine" (ibid, 2007). Platteau (2008) also favors the application of a deductive approach stating that current empirical practices are inconclusive due to the presence of endogeneity which is difficult to overcome.

2. Methodology

2.1 Hypothesis & Variable Selection

This paper investigates various hypotheses. The *first* hypothesis posits that 'Muslim countries are underdeveloped due to restricting economic freedoms. The variable for economic freedoms will be represented by the proxies business freedom, labor freedom, trade freedom, investment freedom, and financial freedom from the Index of Economic Freedoms (Heritage, 2022).

The *second* hypothesis is regarding how 'oil-rich Muslim countries such as the GCC countries are underdeveloped due to their *high dependence on external rent*', i.e., resource curse thesis (Auty, 1995). The reason for including this hypothesis is because despite fair levels of economic well-being, i.e., high GDP per capita and higher standards of living relative to poor Muslim countries etc., these oil-rich countries tend to fare poorly in various social, political, and education etc. performance indicators. As such, this research hypothesizes that the high external rents the GCC countries generate distort the true reality of their levels of development. The variable for reniterism will be represented by 'Total natural resources rents (% of GDP)' (World Bank, 2022).

The *third* hypothesis posits that 'Muslim Countries are underdeveloped due to Political Instability'. This hypothesis is based on Alesina et al. (1996). The variable for political instability will be represented by the variables 'C1: Security Apparatus; C2: Factionalized Elites; C3: Group

Grievance; and X1: External Intervention' from the Fragile States Index (FSI, 2022).

The *fourth* hypothesis, and in accordance with Weber's (1958) and Ibn Khuldon's (1967) positions on the importance of culture and social cohesion, posits that 'Muslim countries are underdeveloped due to *Social Dissension*' or the loss of social cohesion or 'Assabiyah' (Ibid, 2004). The variable for social dissension will be represented by the proxy 'Social Capital', which is composed of five variables: 1) Personal & Family Relationships; 2) Social Networks; 3) Interpersonal Trust; 4) Institutional Trust; and 5) Civic & Social Participation (Legatum, 2022).

The *fifth* hypothesis, and in accordance with endogenous growth theory, posits that 'Muslim countries are underdeveloped due to their *Poor Creation of Knowledge*'. The variable for knowledge creation is represented by 'Poor Academic Influence', which itself is measured by 'Research Output per Capita', i.e., citations per capita. The data on citations is derived from Scimago (2022), whilst the population data is derived from World Bank (2022).

The various hypotheses of this study are summarized as follows:

a) H1: Muslim Countries are underdeveloped due to *Restricting Economic Freedoms*.
b) H2: Muslim Countries are underdeveloped due to an *overreliance on External Rent*.
c) H3: Muslim Countries are underdeveloped due to *Political Instability*.
d) H4: Muslim Countries are underdeveloped due to *Social Dissension*.
e) H5: Muslim Countries are underdeveloped due to *Poor Knowledge Creation*.

The null hypothesis (H0) is that a relationship exists between the variable being tested and the dependent variable HDI, whilst the alternative hypothesis (H1) is that no relationship exists.

2.2 Model Data Summary

The study utilizes dynamic panel data with a times series of 13 years (t) (2007-2019), for 151 countries (n). The sample period (t) and country

selection (n) are influenced by data availability, i.e., the dataset for the variable *social dissension* only goes back as far as 2007. Given the low percentage of missing data, i.e., ~0.25%, no interpolation takes place. Moreover, of the 56 OIC member countries, 49 Muslim countries are included, whilst 7 are excluded due to insufficient data. The countries (n) included in the dataset are presented in Table A-1 (Appendix A).

Regarding the data normalization, the dataset will be normalized using the z-standardization method. This method transforms the dataset values into a scale with a mean of zero and a standard deviation of one.

2.3 Pre-estimation procedure

Two pre-estimation methods are utilized in this study. The first method is a correlation analysis to examine the relationship between the variables included in the model. The second method is the variance inflation factors (VIF) which is a test of multicollinearity among the independent variables. Regarding the correlation analysis, highly correlated indices could lead to double counting, thereby distorting the regression results. According to Ratner (2009), highly correlated variables are those where the correlation coefficient is between +/- 0.7 to 1.0. The results of the correlation analysis are presented in Table 1 in the form of a correlation matrix.

Table 1: Correlation Matrix of DV & IV's

	HDI	**EF**	**RENT**	**PI**	**SD**	**KC**
HDI	**1.00**	(0.67)	(0.28)	(0.73)	(0.52)	(0.61)
EF	(0.67)	**1.00**	0.41	0.69	0.44	0.60
RENT	(0.28)	0.41	**1.00**	0.29	0.11	0.27
PI	(0.73)	0.69	0.29	**1.00**	0.59	0.70
SD	(0.52)	0.44	0.11	0.59	**1.00**	0.66
KC	(0.61)	0.60	0.27	0.70	0.66	**1.00**

According to the correlation analysis results, political instability is highly correlated with the HDI (-0.73) and poor knowledge creation (0.7). Moreover, the HDI is correlated with restricting economic freedoms (-0.67) and poor knowledge creation (-0.61). Given that correlation results can be misleading, i.e., two variables could be highly correlated yet they measure two very distinct phenomena, a VIF test is conducted to check for multicollinearity among the independent variables. According to Menard (2001), a VIF value greater than 5 is troublesome, whilst a value greater than 10 indicates that significant collinearity exists. The results of the VIF analysis are presented in Table 2. In summary, there is some multicollinearity in the model, but not severe enough to warrant further corrective measures, i.e., no variables are excluded from the model.

Table 2: VIF test values computed in R

EF	RENT	PI	SD	KC
2.22	1.22	2.64	1.9	2.57

2.4 Estimation Procedure: Dynamic Panel GMM

Due to a weak theoretical basis for empirically testing the influence of religion on economic growth, and due to a lack of a theoretical framework for testing the influence of behavior on socio-economic development, i.e., a framework which differentiates between Islam and the behavior of its constituents, and due to the presence of an endogeneity problem when testing the influence of religion (Basedau et al., 2018) and behavior on socio-economic development, i.e., 'weak' assumptions according to Hansen (1982), and due to the endogeneity problem caused by specific country-effects (Sarmidi et al., 2015), and due to utilizing dynamic panel data with 't=13' and a large sample of countries 'n=151' (Nickell, 1981; Arellano et al., 1991; Roodman, 2009), and given that the independent variables are not strictly exogenous (Roodman, 2009), i.e., correlated with past and possibly current error term (Ibid, 2009), the *generalized method of moments* estimators (GMM) will be utilized for the purpose of this study.

Besides addressing endogeneity, GMM also addresses "measurement errors, omitted variable bias, and eliminates heteroscedasticity and serial correlation" (Caselli et al., 1996). As such, the GMM method is the best

method for cross-country studies which give rise to the endogeneity problem and individual effect correlation (Ibid, 1996).

3.4.1 Difference vs. System GMM

There are two popular estimators for panel GMM – *Difference GMM* and *System GMM* (Roodman, 2009). Diff-GMM uses moments conditions for the estimated first difference to eliminate fixed effects. Sys-GMM on the other hand combines the moment conditions and simultaneously estimates in difference and levels (Windmeijer, 2000; Roodman, 2009).

The advantage of using Arellano & Bover (1995) and Blundell & Bond (1998) sys-GMM over Arellano & Bond (1991) diff-GMM is that the former is better suited for panel data when *n* is larger than *t*, when a linear functional relationship exists in the model, when the dependent variable is dynamic, when the independent variables are not strictly exogenous, i.e., not affected by external factors, when unobserved heterogeneity exists in the form of fixed individual effects, as well as due to the presence of heteroskedasticity and autocorrelation within the variables but not across them. Moreover, Blundell et al. (1998; 2001) show that sys-GMM has better finite sample properties relative to diff-GMM, particularly how it has a smaller bias and root mean squared errors (Bun et al., 2010), and greater precision relative to diff-GMM when the dependent variable is persistent and the series are stationary (Yamarik et al., 2017). Another advantage is how under sys-GMM the internal instruments or variables can be utilized to identify the endogenous variable (Ibid, 2017). In summary, sys-GMM is a more accurate estimator relative to diff-GMM, justifying its application over diff-GMM by the many studies utilizing panel data.

With that said, and despite their limitations in the presence of endogeneity (Nickell, 1981), this study will run the GMM model for Pooled OLS, Fixed Effect (FE), and diff-GMM regression before running the sys-GMM model. The rationale is that by running the models using these techniques and comparing the lagged coefficients of the dependent variable, the researcher will be able to conclude if the model is better fitted for diff-GMM or sys-GMM, i.e., if the lagged coefficient of the DV at level 2 for the diff-GMM model is closer to the FE lagged DV coefficient than the Pooled OLS coefficient, then sys-GMM is a better fit for the model. The below output in R statistical software (Team, 2020), shows

that *sys-GMM is better suited* to the study's model given that the lagged DV coefficient for diff-GMM (0.876) is closer to the lagged DV coefficient of the FE model (0.922) than the lagged DV coefficient of the Pooled OLS model (0.989) at level 2:

Table 3: Diff-GMM vs. Pooled OLS vs. FE coefficients comparison

Variable	Diff-GMM	Pooled OLS	Fixed Effects
δHDIit-1	0.8755	0.9890	0.9226
EFyit-1	-0.0061	-0.0009	-0.0020
RENTyit-1	-0.0271	-0.0005	0.0052
PIyit-1	0.0273	-0.0025	0.0061
SDyit-1	-0.0002	-0.0064	-0.0041
KCyit-1	-0.0100	-0.0069	-0.0039

2.5 Developing the Empirical Model

The model developed in this study follows the common form in Ahn et al. (1999), where Y_{it} is the dependent variable, x_{it} is a 1*p vector of the independent variables, and the u_{it} is a composite error term which includes a_i as the individual effect, and ε_{it} as the normal error term.

$$Y_{it} = x_{it}\beta + u_{it};\ u_{it} = \alpha_i + \varepsilon_{it} \qquad (1)$$

3.5.1 Model Specifics

Given the dynamic panel nature of the dataset, the study's empirical model is inspired by the following equations developed for GMM estimation of panel data in R as presented by Phillips et al. (2019):

$$y_{it} = \alpha_i + \beta_1 y_{it-1} + \beta_2 y_{it-1} + \lambda_{t-1} + u_{it} \qquad (2)$$

$$\lambda_{t-1} = y_0 + y_1 \bar{y}_{t-1} + y_2 \bar{x}_{t-1} + y_3 z_{t-1} \qquad (3)$$

Where $(\bar{y}_{t-1},\bar{x}_{t-1}) = (N^{-1}\sum^{N}_{i=1}y_{it},N^{-1}\sum^{N}_{i=1}x_{it})$ are cross-section aggregates of y_{it-1} and x_{t-1}, and z_{t-1} are exogenous instruments, whilst u_{it} is the disturbance or error term.

With that said, the study's system GMM model is presented as follows:

$$HDI_{it} = \delta HDI_{it-1} + \beta_1 EF_{yit-1} + \beta_2 RENT_{yit-1} + \beta_3 PI_{yit-1} \quad (4)$$

$$+ \beta_4 SD_{yit-1} + \beta_5 KC_{yit-1} + \alpha_i + \theta_t + \varepsilon_{it}$$

Where δHDI_{it-1} represents the lag of the dependent variable HDI, EF_{yit-1} represents the lag of the independent variable 'Restricting Economic Freedoms', $RENT_{yit-1}$ represents the lag of the independent variable 'Rentierism', PI_{yit-1} represents the lag of the independent variable 'Political Instability', SD_{yit-1} represents the lagged difference of the independent variable 'Social Dissension', KC_{yit-1} represents the lagged difference of the independent variable 'Poor Knowledge Creation', α_i represents the individual effect of country i, θ_t represents the time effect at given time t, and ε_{it} represents the error term.

3.5.2 Empirical Model Summary

The sys-GMM model includes lagged and level difference transformations of the dependent and independent variables. This transformation facilitates for the exclusion of external instruments in the model, as the lagged and difference independent variables serve as instruments. The highlighted model is for a lag 1 level. Given that the number of countries n= 151, the number of instruments, given t=13, is 66 ([13-1*13-2/]2). As such, since the number of instruments 'z' is smaller than the number of countries 'n', the model is not over specified and should not cause bias estimation (Roodman, 2009). Moreover, since the number of instruments 'z' is smaller than 'n', the data was not collapsed, as over-collapsing leads to a less efficient model. Regarding the use of both the *lag* and *diff* functions in the model, both functions are similar, as they are data step functions which return the previous value of a variable. The main distinction between them is that the lag function returns the value of a prior period, whilst the diff function returns "suitably lagged and iterated differences" (Becker et al., 1988).

The limitation of many sys-GMM model's is that they tend to suffer from multicollinearity and endogeneity. According to Ullah et al. (2018), the problem with endogeneity is that the error term is unobservable, i.e.,

difficult to prove that an internal variable is correlated with the error term. Moreover, the authors (Ibid, 2018) also state that, based on the discourse of Ketokivi et al. (2017), that external variables are never specifically external. As such, it is "almost impossible to statistically ensure that an endogeneity problem can be completely resolved" (Ullah et al., 2018). In conclusion, the best solution to address the endogeneity problem is not to look for solutions, but to seek prevention – i.e., better variable selection and model specifications.

3.5.3 Sys-GMM in R

Before running the model in R, the data is loaded and characterized as panel data using the function *"pdata.frame"* but only after the *"plm"* package (Croissant et al., 2008) is installed and loaded. Other functions to be applied are *time interval dummies* using the function "time.dummies="TRUE"". The purpose of this procedure is to control for time specific fixed effects. Furthermore, the model utilizes both *country specific individual effects*, i.e., α_i, as well as *time effects*, i.e., θ_t. This is referred to as *two-ways effect* and is represented by the following function in R "effect = "twoways"". Given that both individual and time effects are included in the model, two-ways models are considered more accurate than individual effect models. Lastly, the model adopts a *two-step* sys-GMM estimates as this procedure helps eliminate standard errors and is more robust to heteroscedasticity (Akinbode et al., 2020). The model in R is written as:

Table 4: Sys-GMM model in R

```
library(plm)
GMMpanel<- pdata.frame(modeltest, index = c("COUNTRY","YEAR"))
sys_gmm=pgmm(HDI~lag(HDI,1:1)+lag(EF,1:1)+lag(RENT,1:1)+lag(PI,1:1)+diff(
SD,1:1)+diff(KC,1:1)
        |lag(HDI,2:99)
        |lag(EF,2:2)+lag(RENT,2:2)+lag(PI,2:2)+diff(SD,2:2)+diff(KC,2:2),
        data=GMMpanel,
        effect = "twoways",
        model = "twosteps",
        transformation = "ld",
        fsm = "FULL",
        subset = sample == 1, time.dummies="TRUE")
summary(sys_gmm)
```

2.6 Post-Diagnostic Tests

Several diagnostic tests will be conducted to test the validity of the model and its assumptions. The *first* diagnostic test is the *Sargan (1958)/Hansen (1982)* test for over-identifying restrictions. According to Roodman (2009), the researcher should not "take comfort in a Hansen test with a p-value below 0.1". Furthermore, the researcher must "consider high values such as 0.25 as potential signs of trouble". Regarding the hypotheses for these tests, the null hypothesis (H0) is "instrument variables are exogenous", and "the instruments are uncorrelated with the error term". According to Hayashi (2000); Parente et al. (2012); and Kiviet (2017), a primary limitation of the Sargan/Hansen tests is that "they can only verify over-identifying restrictions, while implicitly adopting untestable just-identifying restrictions" (Ibid, 2017). The desired outcome of these test is to fail to reject the null hypothesis, meaning that the model instruments are valid.

The *second* diagnostic test is the *Arellano-Bond test (1991)* which tests for first and second order correlation – i.e., serial autocorrelation. The null hypothesis (H0) for AR1 is "there is a first order serial correlation in the error term", whilst the null hypothesis (H0) for AR2 is "there is a second order serial correlation in the error term". The desired outcome for this test is to reject the null hypothesis at AR(1) whilst failing to reject the null hypothesis at AR(2), meaning that the model is not misspecificed.

The *third* diagnostic test is the *Wald Chi-Squared test (1943)* which tests for joint significance of parameters. The purpose of this test is to identify the relationship between the dependent and the independent variables and prove there is no association between them. The null hypothesis (H0) of the Wald Chi test is "no relationship exists between the dependent and the independent variables". The null hypothesis can be accepted if the F-stat shows a p-value below 0.05. The desired outcome of this test is to fail to reject the null hypothesis, i.e., endogeneity is not present.

3. Empirical Results

3.1 Sys-GMM regression results

The results of the regression analysis are presented in Table 5 as follows:

Table 5: Sys-GMM Regression Results

Variable	Coefficient	Std. Error	z-value	Pr(>|z|)
δHDIit-1	0.9721	0.0058	168.4252	< 2.2e-16***
EFyit-1	-0.0056	0.0026	-2.1551	0.031156*
RENTyit-1	-0.0018	0.0021	-0.8549	0.3926
PIyit-1	-0.0106	0.0036	-2.9071	0.003648**
SDyit-1	-0.0089	0.0037	-2.4395	0.014709*
KCyit-1	-0.0277	0.0128	-2.1595	0.030809*
Note: ***, **, * are statistical significance at the 0.1%, 1%, and 5% levels respectively.				

According to the sys-GMM regression results, the lag of the dependent variable δHDI_{it-1} (IV1), is highly significant at the 0.001 level. The high significance level is a measure of the goodness of fit of the empirical model since the value of δHDI_{it-1} 0.97 falls between the OLS δHDI_{it-1} value of 0.99 and the FE δHDI_{it-1} value of 0.92 as presented in Table 3, which is within the range recommended by Roodman (2009). Regarding restricting economic freedoms, i.e., the lag of the independent variable EF_{yit-1} (IV2), the study finds a negative and significant relationship at the 0.05 level, i.e., as restricting economic freedoms decreases, human development increases; and vice versa. This outcome is similar to Goldsmith (1997) who finds that countries which protect economic freedoms have higher levels of development. Regarding rentierism, i.e., the lag of the independent variable $RENT_{yit-1}$ (IV3), the study does not find a significant relationship between high dependence on external rent and human development. The research findings reject the resource curse thesis, i.e., natural resource abundance is detrimental to a country's well-being in the long run. These findings are consistent with Alexeev et al. (2009) who question the validity of the thesis. Regarding political instability, i.e., the lag of the independent variable PI_{yit-1} (IV4), the study finds a negative and significant relationship at the 0.01 level with the HDI. Moreover, the results indicate that as political instability increases by 1 unit, the HDI decreases by 0.01 (1%). These findings are consistent with Alesina et al.'s (1996) thesis on political stability and Fosu (2004) who

finds that political instability hinders economic development. Regarding social dissension, i.e., the lagged difference of the independent variable SD_{yit-1} (IV5), the study finds a negative and significant relationship, i.e., at 0.05 level., between social dissension and human development, i.e., as social dissension decreases, human development increases. These findings are consistent with Ibn Khuldon's concept of Assabiyah (1967), i.e., social cohesion is necessary for the survival of the dynasty, as well as the findings of Fukuyama (2001) and Iyer et al. (2005). Lastly, the study finds a negative and highly significant relationship, i.e., at 0.05 level, between poor knowledge creation, i.e., the lagged difference of the independent variable KC_{yit-1} (IV6), and the HDI, i.e., as poor knowledge creation increases by 1 unit, the HDI decreases by 0.0277 (2.8%). The research findings confirm Romer's (1994) endogenous growth theory and are also in line with the various economic schools of thought which posit that knowledge improves productivity and offsets decreased returns to capital (Romer; 1993, Jimenez, 2019).

3.2 Diagnostic Results

The results of the post-estimation tests are presented in Table 6:

Table 6: Sys-GMM Model Diagnostic Results

Test	P-Value
Sargan test	0.15605
AR (1) test	4.0954e-07
AR (2) test	0.67107
Wald test for coefficients	< 2.22e-16
Wald test for time dummies	1.6128e-05

4.2.1 Test 1: Sargan (1958)/Hansen (1982)

The model instruments are valid since the p-value of 0.15 is greater than the threshold of 0.05. As such, the results confirm that the model instruments are exogenous and that they are uncorrelated with the error term, i.e., fail to reject null hypothesis (H0). Moreover, the p-value is

within the range recommended by Roodman (2009) who posits that the p-value should be greater than 0.1 but less than 0.25 which adds further validity to the goodness of fit of the model, i.e., the model is not overidentified.

4.2.2 Test 2: Arellano-Bond test (1991)

Testing for autocorrelation at lag 1, i.e., AR1, and lag 2, i.e., AR2, the results find that autocorrelation is present at lag 1 (AR1) since the p-value is less than 0.05, i.e., reject null hypothesis. This is anticipated due to the presence of the lagged dependent variable (Habimana, 2017). Regarding AR2, no autocorrelation is present since the p-value of 0.67 is greater than 0.05, i.e., fail to reject null hypothesis. Since autocorrelation is present at lag 1 but absent at lag 2, the model is valid according to Roodman (2009).

4.2.3 Test 3: Wald Chi-Squared test (1943)

Regarding the test for the joint significance of parameters, the results find that since the p-value is less than 0.05, endogeneity is present, i.e., reject null hypothesis, and instrumental variables are necessary. The results of the Wald test are similar to Arellano and Bond (1991) as presented in Table 7:

Table 7: Arellano et al. (1991) Diagnostic Results

Test	P-Value
Sargan test	0.22011
AR (1) test	0.0075948
AR (2) test	0.36974
Wald test for coefficients	< 2.22e-16
Wald test for time dummies	0.00015090

4. Discussion

According to the sys-GMM regression results, human development is influenced by a country's level of economic freedoms, political instability, social dissension, and knowledge creation. Comparing the

country ranks of the 49 Muslim countries in these variables to the more developed OECD countries, it becomes clear that Muslim countries are underdeveloped due to their poor performance in the aforementioned measures. A comparison of the average country ranks of OIC countries and OECD countries in the inverse of the independent variables, i.e., the negative sign of the variables is reversed for simplification, is presented in Table 8 as follows:

Table 8: OIC vs. OECD Average Country ranks (n=151)

	HDI	**EF**	**PI**	**SD**	**KC**
OIC	99.41	98.88	100.76	83.84	98.33
OECD	23.03	25.86	26.7	48.46	24.05

With that said, does the negative and significant relationship between the HDI and the various independent variables suffice in answering the research question whether Islam is detrimental to development? Although the results of the empirical model provide great insight as to why Muslim countries are underdeveloped, it does not fully explain the impact of Islam on development. To elaborate, even though it has become clear that Muslim countries are underdeveloped due to various economic, political, social, and knowledge shortcomings, the model fails to address the question whether Islam and its teachings are detrimental to development. What the model does explain however is that Muslim countries are underdeveloped due to the engagement of its individuals and institutions in development hindering behavior, but since the study solely adopts an inductive approach which does not involve examining the religion itself and whether it promotes any behaviors or actions which hinder development, i.e., a deductive approach, the research question is not fully addressed. To address this limitation, a better approach is to utilize both inductive and deductive methodologies which attempt to 1) examine the behaviors which lead to the poor development of Muslim countries, i.e., just as this study has attempted; 2) delve into the Islamic scripts to identify any teachings or principles which promote or hinder development, i.e., a descriptive approach.

5. Conclusion, Future Research, & Policy Implications

Islamic civilizations of the past were highly developed due to their technological, education, military, and economic prowess. When the last Islamic civilization seized to exist after the demise of the Ottoman empire, the newly formed Muslim countries, including those well-endowed with natural resources, were unable to match the development status of their western counterparts. Many scholars attribute this poor development to Islam, positing that Islam is anti-growth. The problem with such position is that these scholars do not differentiate between Islam and its teachings, and the behavior of the Muslim population. This can be attributed to theoretical and methodological shortcomings which has led to false conclusions and subsequent prejudice towards Islam and Muslims. Moreover, blaming Islam for the poor development of Muslim countries detracts from focusing on more likely culprits such as restricting economic freedoms, high levels of public sector corruption, high levels of political instability, social dissension, poor knowledge creation, and the poor application of the rule of law etc.

As such, it is imperative to develop a better understanding of the phenomenon and attempt to identify the real causes of the poor development of Muslim countries by conducting an objective study which examines the relationship between measures of development and measures of development hindering behavior to differentiate between Islam as a religion, and the behavior of the Muslim population.

With that said, the purpose of this paper is to identify the possible reasons why Muslim countries are underdeveloped, and whether individual and institutional behavior play a role in such poor development, or is Islam, as opined by many scholars, the real culprit. To achieve this objective, a system GMM approach is utilized to study the relationship between the Human Development Index and various independent variables, which according to the theory and literature, are inhibitors of development. The dataset utilized includes 151 countries, of which 49 are Muslim, and spans over 13 years, i.e., 2007 – 2019. The results of the sys-GMM regression find a negative and significant relationship between human development and restricting economic freedoms, political instability, social dissension, and poor knowledge creation. According to the post-estimation tests, the model is robust given that it is not overidentified, the number of instruments is less than the number of countries, and due to the absence

of autocorrelation at lag 2. With that said, the results of the Wald test indicate the presence of endogeneity, which validates the use of instrumental variables. Even though the results of the sys-GMM regression validate the hypothesis that individual and institutional behavior are to blame for the poor development of Muslim countries, it suffers from the same limitations as the many literatures which attempted to study the impact of Islam on economic growth, development et al. To elaborate, similar to these studies, the paper adopts an inductive approach and forgoes the application of a deductive approach which could provide better insight as to whether Islam promotes teachings and behaviors which promote or hinder development. As such, future research must adopt both empirical and descriptive approaches to provide a larger and more accurate picture of the phenomenon being studied.

Regarding policy implications, and in line with the study findings, the most important behaviors for development are those which contribute to a stable political environment, lead to high levels of harmony among the population, increase the knowledge output of the population, and enhance economic freedoms by removing barriers which could harm such freedoms. With that said, governments must adopt policies which advocate increasing education, technology, and innovation expenditures; facilitate for the accountability of political leaders; impose strict punishments to deter and reprimand individuals and institutions from engaging in development hindering behavior, whilst rewarding those who engage in development promoting behavior; promote cultural, religious, and social unity programs at schools and similar educational institutions to reduce social dissension and fractionalization; increase transparency in business transactions, bridge capital market gaps for small business owners, impose the rule of law on monopolistic activities, and reduce income inequality, unemployment, and inflation. Moreover, policies such as nudging can be implemented as well to subconsciously push individuals towards behavior which could lead to positive outcomes. In summary, the study findings highlight the importance of individual and institutional behavior for achieving high levels of development, and the decision makers in Muslim countries must embrace and act upon this position if Muslim countries are to return to a golden past.

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References

Ahn, S., & Schmidt, P. (1999). Estimation of Linear Panel Data Models Using GMM. In L. Matyas (Ed.), *Generalized Method of Moments Estimation (Themes in Modern Econometrics)*, pp. 211-247. Cambridge: Cambridge University Press.

Akçay, S. (2006). "Corruption and human development". *Cato Journal, 26(1),* pp. 29-48.

Akinbode, S.O. & Bolarinwa, T.M. (2020). Effect of foreign aid on human development in Sub-Saharan Africa: a system GMM approach. *South-Eastern Europe Journal of Economics, 18(1),* pp. 19-38.

Akinsola, F. A., & Odhiambo, N. M. (2017). "Inflation and Economic Growth: A Review of The International Literature". *Comparative Economic Research, 20(3),* pp. 41-56. Available at: http://hdl.handle.net/11089/24194.

Alesina, A., Özler, S., Roubini, N. & Swagel, P. (1996). "Political instability and economic growth". *Journal of Economic growth*, *1*(2), pp. 189-211. https://doi.org/10.1007/BF00138862.

Alexeev, M. & Conrad, R. (2009). "The elusive curse of oil". *The review of Economics and Statistics*, *91*(3), pp. 586-598. https://doi.org/10.1162/rest.91.3.586.

Arellano, M., & Bond, S. (1991). "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations". *The review of economic studies*, *58*(2), pp. 277-297. https://doi.org/10.2307/2297968.

Arellano, M., & Bover, O. (1995). "Another look at the instrumental variable estimation of error-components models". *Journal of Econometrics, 68(1),* pp. 29-51. https://doi.org/10.1016/0304-4076(94)01642-D.

Auty, R.M. (1995). Economic Development and the Resource Curse Thesis. In: Morrissey O., Stewart F. (eds) *Economic and Political Reform in Developing Countries*. London: Palgrave Macmillan. https://doi.org/10.1007/978-1-349-13460-1_4.

Aydın, C., Esen, Ö., & Bayrak, M. (2016). "Inflation and Economic Growth: A Dynamic Panel Threshold Analysis for Turkish Republics

in Transition Process". *Procedia-Social and Behavioral Sciences, 229*, pp. 196-205. https://doi.org/10.1016/j.sbspro.2016.07.129.

Bae, K.H., Bailey, W., & Kang, J. (2021). "Why is stock market concentration bad for the economy?". *Journal of Financial Economics*, *140*(2), pp. 436-459. https://doi.org/10.1016/j.jfineco.2021.01.002.

Barro, R., & McCleary, R. (2003). "Religion and economic growth across countries". *American Sociological Review, 68(5)*, pp. 760–781. https://doi.org/10.2307/1519761.

Basedau, M., Gobien, S., & Prediger, S. (2018). "The multidimensional effects of religion on socioeconomic development: a review of the empirical literature". *Journal of Economic Surveys*, *32*(4), pp. 1106-1133. https://doi.org/10.1111/joes.12250.

Becker, R. A., Chambers, J. M. & Wilks, A. R. (1988). The New S Language. Wadsworth & Brooks/Cole.

Blundell, R., & Bond, S. (1998). "Initial conditions and moment restrictions in dynamic panel data models". *Journal of econometrics*, *87*(1), pp. 115-143. https://doi.org/10.1016/S0304-4076(98)00009-8.

Blundell, R., Bond, S., & Windmeijer, F. (2001). Estimation in dynamic panel data models: improving on the performance of the standard GMM estimator. In B. Baltagi (Ed.), *Nonstationary Panels, Panel Cointegration, and Dynamic Panels, Advances in Econometrics, 15*, pp. 53-91. New York: JAI Press, Elsevier Science. https://doi.org/10.1016/S0731-9053(00)15003-0.

Bun, M. J. G., & Windmeijer, F. (2010). "The weak instrument problem of the system GMM estimator in dynamic panel data models". *Econometrics Journal, 13(1)*, pp. 95-126. https://doi.org/10.1111/j.1368-423X.2009.00299.x.

Caselli, F., Esquivel, G., & Lefort, F. (1996). "Reopening the Convergence Debate: A New Look at Cross-Country Growth Empirics". *Journal of Economic Growth, 1(3)*, pp. 363-389. https://doi.org/10.1007/BF00141044.

Chapra, M.U. (2008). "Ibn Khaldun's theory of development: Does it help explain the low performance of the present-day Muslim world?". *The Journal of Socio-Economics*, *37*(2), pp. 836-863. https://doi.org/10.1016/j.socec.2006.12.051.

Chhibber, A., & Laajaj, R. (2007). A multi-dimensional development index: Extending the Human Development Index with environmental sustainability and security. *UNDP[online] Available at: http://www. aae. wisc. edu/events/papers/DevEcon/2008/laajaj*, *10*.

Ciftci, S. (2022). On Weber, Pathogens, and Culture: A Global Empirical Analysis of Religion and Individualism. *Journal for the Scientific Study of Religion*, *61*(2), pp. 331-348. https://doi.org/10.1111/jssr.12778.

Crocco, M.S., Pervez, N. & Katz, M. (2009). "At the crossroads of the world: Women of the Middle East". *The Social Studies*, *100*(3), pp. 107-114. https://doi.org/10.3200/TSSS.100.3.107-114.

Croissant, Y. & Millo, G. (2008). "Panel data econometrics in R: The plm package". *Journal of statistical software*, *27*(2). https://doi.org/10.18637/jss.v027.i02.

Dasgupta, P., & Weale, M. (1992). "On measuring the quality of life". *World development*, *20*(1), pp. 119-131. https://doi.org/10.1016/0305-750X(92)90141-H.

Djedi, Y. (2011). "Max Weber, Islam and Modernity". *Max Weber Studies*, pp. 35-67. https://www.jstor.org/stable/24579976.

Doucouliagos, C., & Ulubasoglu, M.A. (2006). "Economic freedom and economic growth: Does specification make a difference?". *European journal of political economy*, *22*(1), pp. 60-81. https://doi.org/10.1016/j.ejpoleco.2005.06.003.

Fosu, A.K. (2004). "Mapping Growth into Economic Development: Has Elite Political Instability Mattered in Sub-Saharan Africa?". *American Journal of Economics and Sociology*, *63*(5), pp. 1173-1192. https://doi.org/10.1111/j.1536-7150.2004.00340.x.

FSI (2022). Fragile States Index, *https://fragilestatesindex.org/data/*, Accessed 16 May 2022.

Fukuyama, F. (2001). "Social capital, civil society and development". *Third world quarterly*, *22*(1), pp. 7-20. https://doi.org/10.1080/713701144.

Gezer, M.A. (2020). "The Impact of Economic Freedom on Human Development in European Transition Economies". *Economic*

Computation & Economic Cybernetics Studies & Research, 54(3), pp. 161-178. https://doi.org/10.24818/18423264/54.3.20.10.

Goldsmith, A.A. (1997). "Economic rights and government in developing countries: Cross-national evidence on growth and development". *Studies in Comparative International Development*, *32*(2), pp. 29-44. https://doi.org/10.1007/BF02687323.

Greif, A. (2006). "Institutions and the path to modern economy". New York: Cambridge University Press.

Guiso, L., Sapienza, P., & Zingales, L. (2003). "People's opium? Religion and economic attitudes". *Journal of monetary economics*, *50*(1), pp. 225-282. https://doi.org/10.1016/S0304-3932(02)00202-7.

Habimana, O. (2017). "Do flexible exchange rates facilitate external adjustment? A dynamic approach with time-varying and asymmetric volatility". *International Economics and Economic Policy*, *14*(4), pp.625-642. https://doi.org/10.1007/s10368-016-0341-7.

Hansen, L.P. (1982). "Large sample properties of generalized method of moments estimators". *Econometrica: Journal of the econometric society*, pp. 1029-1054. https://doi.org/10.2307/1912775.

Hayashi, F. (2000). Econometrics. Princeton: Princeton University Press.

Heritage (2022). The Heritage Foundation, *heritage.org/Index*, Accessed 16 May 2022.

Ibn Khuldon, A.A.M., & Rosenthal, F. (1967). The Muqaddimah: An introduction to history. Princeton, N.J: Princeton University Press.

Iyer, S., Kitson, M. & Toh, B. (2005). "Social capital, economic growth and regional development". *Regional studies*, *39*(8), pp.1015-1040. https://doi.org/10.1080/00343400500327943.

Jimenez, J.R. (2019). "Mainstream and evolutionary views of technology, economic growth and catching up". *Journal of Evolutionary Economics, 29(3)*, pp. 823-852. https://doi.org/10.1007/s00191-019-00606-1.

Kaminski, J.J. (2016). "Beyond capitalism: A critique of Max Weber's general understanding of the Islamic discourse". *Intellectual Discourse*, *24*(1). Available at: https://journals.iium.edu.my/intdiscourse/index.php/id/article/view/714.

Karaçuka, M. (2018). Religion and economic development in history: Institutions and the role of religious networks. *Journal of Economic Issues*, *52*(1), pp. 57-79. https://doi.org/10.1080/00213624.2018.1430941.

Kelley, A.C. (1991). "The human development index: "Handle with Care"". *Population and development review*, pp. 315-324. https://doi.org/10.2307/1973733.

Ketokivi, M., & McIntosh, C. N. (2017). "Addressing the endogeneity dilemma in operations management research: Theoretical, empirical, and pragmatic considerations". *Journal of Operations Management, (52)*, pp. 1-14. https://doi.org/10.1016/j.jom.2017.05.001.

Khalfaoui, H. & Guenichi, H. (2021). Does Islam promote growth: evidence from Arab Muslim countries and non-Arab Muslim countries. *International Journal of Law and Management*, *64*(2), pp. 206-224. https://doi.org/10.1108/IJLMA-07-2021-0166.

Kiviet, J., Pleus, M., & Poldermans, R. (2017). "Accuracy and efficiency of various GMM inference techniques in dynamic micro panel data models". *Econometrics*, *5*(1), pp. 14.

Klugman, J., Rodríguez, F. & Choi, H.J. (2011). "The HDI 2010: new controversies, old critiques". *The Journal of Economic Inequality*, *9*(2), pp. 249-288. https://doi.org/10.1007/s10888-011-9178-z.

Krieckhaus, J. (2002). "Reconceptualizing the developmental state: public savings and economic growth". *World development*, *30*(10), pp. 1697-1712. https://doi.org/10.1016/S0305-750X(02)00064-5.

Kumar, V.A. (2012). "Money laundering: Concept, significance and its impact". *European Journal of Business and Management*, *4*(2).

Kuran, T., (1997a). "Islam and underdevelopment: an old puzzle revisited". *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, pp. 41-71. https://www.jstor.org/stable/40752985.

Kuran, T. (1997b). Private truths, public lies. Harvard University Press.

Kuran, T. (2004). "Why the Middle East is economically underdeveloped: historical mechanisms of institutional stagnation". *Journal of economic perspectives*, *18*(3), pp. 71-90. https://doi.org/10.1257/0895330042162421.

Kusharjanto, H., & Kim, D. (2011). "Infrastructure and human development: the case of Java, Indonesia". *Journal of the Asia Pacific Economy*, *16*(1), pp. 111-124. https://doi.org/10.1080/13547860.2011.539407.

Legatum (2022). Legatum Prosperity Index, *https://www.prosperity.com/rankings*, Accessed 16 May 2022.

Lewis, B. (2002). What went wrong?: Western impact and Middle Eastern response. Oxford University Press.

Lind, N.C. (1992). "Some thoughts on the human development index". *Social Indicators Research*, *27*(1), pp. 89-101. https://doi.org/10.1007/BF00300511.

Mangeloja, E. (2005). "Economic growth and religious production efficiency". *Applied Economics*, *37*(20), pp. 2349-2359. https://doi.org/10.1080/00036840500217531.

McGillivray, M. (1991). "The human development index: Yet another redundant composite development indicator?". *World Development*, *19*(10), pp. 1461-1468. https://doi.org/10.1016/0305-750X(91)90088-Y.

Megahed, N., & Lack, S. (2011). "Colonial legacy, women's rights and gender-educational inequality in the Arab World with particular reference to Egypt and Tunisia". *International review of Education*, *57*(3), pp. 397-418. https://doi.org/10.1007/s11159-011-9215-y.

Menard, S. (2001). Applied Logistic Regression Analysis. California: Sage Publications.

Mo, P. H. (2001). "Corruption and Economic Growth". *Journal of Comparative Economics, 29,* pp. 66-79.

Mohanty, A. K., Nayak, N. C., & Chatterjee, B. (2016). "Does Infrastructure Affect Human Development? Evidences from Odisha, India". *Journal of Infrastructure Development, 8(1),* pp. 1-26. https://doi.org/10.1006/jcec.2000.1703.

Murray, C.J. (1991). Development data constraints and the Human Development Index (No. 25). Nueva York: United Nations Research Institute for Social Development.

Nickell, S. (1981). "Biases in Dynamic Models with Fixed Effects". *Econometrica, 49(6)*, pp. 1417-1426. https://doi.org/10.2307/1911408.

Noland, M. (2005). "Religion and economic performance". *World development*, *33*(8), pp. 1215-1232. https://doi.org/10.1016/j.worlddev.2005.03.006.

Parente, P.M., & Silva, J.S. (2012). "A cautionary note on tests of overidentifying restrictions". *Economics Letters*, *115*(2), pp. 314-317. https://doi.org/10.1016/j.econlet.2011.12.047.

Phillips, P.C. & Han, C. (2019). Dynamic panel GMM using R. In *Handbook of Statistics (41)*, pp. 119-144. https://doi.org/10.1016/bs.host.2019.01.002.

Pinto, T., & Teixeira, A. A. C. (2020). "The impact of research output on economic growth by fields of science: a dynamic panel data analysis, 1980–2016". *Scientometrics, 123(2)*, pp. 945-978. https://doi.org/10.1007/s11192-020-03419-3.

Platteau, J.P. (2008). "Religion, politics, and development: Lessons from the lands of Islam". *Journal of Economic Behavior & Organization*, *68*(2), pp. 329-351. https://doi.org/10.1016/j.jebo.2008.06.003.

Popova, Y., & Podolyakina, N. (2014). "Pervasive Impact of Corruption on Social System and Economic Growth". *Procedia - Social and Behavioral Sciences, 110*, pp. 727-737. https://doi.org/10.1016/j.sbspro.2013.12.917.

Priambodo, A. (2021). "The Impact Of Unemployment And Poverty On Economic Growth And The Human Development Index (HDI)". *Perwira International Journal of Economics & Business*, *1*(1), pp. 29-36. https://doi.org/10.54199/pijeb.v1i1.43.

Pryor, F.L. (2007). "The economic impact of Islam on developing countries". *World Development, 35*(11), pp. 1815-1835. https://doi.org/10.1016/j.worlddev.2006.12.004.

Ratner, B. (2009). "The correlation coefficient: Its values range between +1/−1, or do they?". *Journal of targeting, measurement and analysis for marketing*, *17*(2), pp.139-142. https://doi.org/10.1057/jt.2009.5.

Robinson, J.A., & Acemoglu, D. (2012). Why nations fail: The origins of power, prosperity and poverty. New York: Crown Publishers.

Rodinson, M. (1974). Islam and Capitalism. New York: Pantheon.

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: The primacy of institutions over integration and geography in economic development. *Journal of Economic Growth*, *9*, pp. 131-165. https://doi.org/10.1023/B:JOEG.0000031425.72248.85.

Romer, P. (1993). "Idea gaps and object gaps in economic development". *Journal of monetary economics*, *32*(3), pp. 543-573. https://doi.org/10.1016/0304-3932(93)90029-F.

Romer, P. (1994). "The origins of endogenous growth". *Journal of Economic perspectives*, *8(1)*, pp. 3-22. https://doi.org/10.1257/jep.8.1.3.

Roodman, D. (2009). "A Note on the Theme of Too Many Instruments". *Oxford Bulletin of Economics and Statistics*, *71(1)*, pp. 135-158. https://doi.org/10.1111/j.1468-0084.2008.00542.x.

Sagar, A.D., & Najam, A. (1998). "The human development index: a critical review". *Ecological economics*, *25*(3), pp. 249-264. https://doi.org/10.1016/S0921-8009(97)00168-7.

Sargan, J.D. (1958). "The estimation of economic relationships using instrumental variables". *Econometrica: Journal of the Econometric Society*, pp. 393-415. https://doi.org/10.2307/1907619.

Sarmidi, T., Nor, A.H.S.M., & Ridzuan, S. (2015). "Environmental stringency, corruption and foreign direct investment (FDI): Lessons from global evidence". *Asian Academy of Management Journal of Accounting and Finance*, *11*(1), pp. 85-96.

Scimago, (2022). SCImago Journal & Country Rank, *https://www.scimagojr.com/countryrank.php*, Accessed 16 May 2022.

Scully, Gerald W. (1992). Constitutional Environments and Economic Growth. Princeton: Princeton University Press.

Sidani, Y. (2019). Does Islam impede development? A critical analysis. *Journal of Islamic Accounting and Business Research*, *10*(5), pp. 644-662. https://doi.org/10.1108/JIABR-06-2017-0092.

Šikman, M.M., & Grujić, M. (2021). "Relationship of Anti-Money Laundering Index with GDP, financial market development, and

Human Development Index". *NBP. Nauka, bezbednost, policija*, *26*(1), pp. 21-33. https://doi.org/10.5937/nabepo26-29725.

Solarin, S. A., & Yen, Y. Y. (2016). "A global analysis of the impact of research output on economic growth". *Scientometrics*, *108(2)*, pp. 855-874. https://doi.org/10.1007/s11192-016-2002-6.

Srinivasan, T.N. (1994). "Human development: a new paradigm or reinvention of the wheel?". *The American Economic Review*, *84*(2), pp. 238-243.

Team, R.C. (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Todaro, M.P., & Smith, S.C. (2006). Economic development 8th edition. Manila, Philippines: Pearson South Asia Pte. Ltd.

Uddin, M. A., Ali, M. H., & Masih, M. (2017). "Political stability and growth: An application of dynamic GMM and quantile regression". *Economic Modelling*, *64*, pp. 610-625. https://doi.org/10.1016/j.econmod.2017.04.028.

Ullah, S., Akhtar, P. & Zaefarian, G. (2018). "Dealing with endogeneity bias: The generalized method of moments (GMM) for panel data". *Industrial Marketing Management*, *71*, pp. 69-78. https://doi.org/10.1016/j.indmarman.2017.11.010.

UNDP, 2019. Human Development Index (HDI). *UNDP[online] Available at: http://hdr.undp.org/en/indicators/137506/*. Accessed 12 Jan 2022.

Wald, A. (1943). "Tests of statistical hypotheses concerning several parameters when the number of observations is large". *Transactions of the American Mathematical society*, *54*(3), pp. 426-482. https://doi.org/10.2307/1990256.

Weber, M. (1958). The Protestant ethic and the spirit of capitalism. New York: Scribner.

Windmeijer, F. (2000). Efficiency comparisons for a system GMM estimator in dynamic panel data models. In *Innovations in Multivariate Statistical Analysis*, pp. 175-184. Boston, MA: Springer. https://doi.org/10.1007/978-1-4615-4603-0_11.

World Bank (2022). The World Bank Group, *https://data.worldbank.org/*, Accessed 16 May 2022.

Yamarik, S., & Redmon, C. (2017). "Economic Freedom and Corruption: New Cross-Country Panel Data Evidence". *The Journal of Private Enterprise, 32(2),* pp. 17-44.

Yolanda, Y. (2017). "Analysis of factors affecting inflation and its impact on human development index and poverty in Indonesia". *European Research Studies Journal, 20(4B),* pp. 38-56. Available at: https://www.um.edu.mt/library/oar/handle/123456789/33040.**Appendix A**

Table A-1: Countries Included in the Dataset (n=151)

Africa	Japan	**GCC**
Algeria	Kazakhstan	Bahrain
Angola	Kyrgyzstan	Kuwait
Belize	Mongolia	Oman
Benin	South Korea	Qatar
Botswana	Tajikistan	Saudi Arabia
Burkina Faso	Turkmenistan	United Arab Emirates
Burundi	Uzbekistan	**Middle East**
Cameroon	**Central America**	Iran
Central African Republic	Costa Rica	Jordan
Chad	Dominican Republic	Lebanon
Comoros	El Salvador	Yemen
Congo	Guatemala	**Norden**
Congo, Dem. Rep.	Honduras	Denmark
Djibouti	Nicaragua	Finland
Egypt	Panama	Norway
Equatorial Guinea	**Europe**	Sweden
Ethiopia	Albania	**North America**
Gabon	Armenia	Canada
Gambia	Austria	Cuba
Ghana	Belarus	Jamaica
Guinea	Belgium	Mexico
Guinea-Bissau	Bosnia and Herzegovina	Trinidad and Tobago
Guyana	Bulgaria	United States
Ivory Coast	Croatia	**Oceania**
Kenya	Cyprus	Australia
Lesotho	Czech Republic	New Zealand
Liberia	Estonia	Papua New Guinea
Libya	France	**South America**
Madagascar	Georgia	Argentina
Malawi	Germany	Bolivia
Mali	Greece	Brazil
Mauritania	Hungary	Chile
Mauritius	Iceland	Colombia
Morocco	Ireland	Ecuador
Mozambique	Italy	Paraguay
Namibia	Latvia	Peru
Niger	Lithuania	Suriname
Nigeria	Luxembourg	Uruguay
Rwanda	Macedonia	**South Asia**
Sao Tome and Principe	Moldova	Bangladesh
Senegal	Montenegro	India
Seychelles	Netherlands	Nepal
Sierra Leone	Poland	Pakistan
South Africa	Portugal	Sri Lanka
Tanzania	Romania	**Southeast Asia**
Togo	Russia	Cambodia
Tunisia	Serbia	Indonesia
Uganda	Slovakia	Laos
Zambia	Slovenia	Malaysia
Zimbabwe	Spain	Philippines
Asia	Switzerland	Singapore
Azerbaijan	Turkey	Thailand
China	Ukraine	Vietnam
	United Kingdom	