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Alternative Banking Systems and Economic Growth

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Abstract

This paper examines the connection between the presence of Shari'a compliant (Islamic) Banking institutions and growth rates observed in their respective countries. This subject is of increasing importance as Islamic banking has emerged as a competitive and a viable substitute to conventional banking systems in the past four decades. Islamic banks operating in parallel to conventional interest-based banks and their effect on the economy is still undetermined by scholars. This paper explores the principles and spread of Islamic banking, and uses OLS regressions to estimate their impact on national growth rates.

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I - Introduction

There exists a level of uncertainty in the global banking market as Shari'a compliant, Islamic banking institutions grow both in terms of total assets held and number of geographic regions populated. Research on this increasingly important phenomenon is not yet robust enough to predict with certainty the impact of one banking institution over another (Allen). This paper aims to accomplish two major goals: first, to educate readers on the principles and practical applications of Islamic banking, and second, to take a closer look at the impact on overall growth rates caused by alternative banking structures. It is hoped that education will bring closure to market uncertainty, and acceptance of those seemingly alien business practices which improve public choice and welfare.

Although the changes in growth rate caused by the effectors discussed in this paper may appear small, it is important to recall that growth is cumulative, making a quarter of a percent increase significant to long run growth. Similarly, a thousandth of a percent increase in the growth of a large economy would amount to a massive increase in wealth. For developing nations, growth rates are critical to the lifestyles, mortality rates, and infant death rates in those countries. Every year of improved growth forgone presents a very real cost of human life and suffering. Overwhelming evidence proves that as nations grow, they gain a host of connected advantages such as reduced pollution, longer life expectancies, higher standards of living, and overall lower levels of poverty and associated issues (Fontana)

The connection between bank presence and strong growth is well documented. By functioning as intermediaries between savers and spenders, banks are ideal for realigning wealth to where it is most productive in an economy. Efficiently run banks also act as stabilizing agents in an economy by holding secured wealth and encouraging entrepreneurial efforts (Levine). The possibility of GDP growth being affected by alternative banking systems is still a debated subject among scholars. This paper seeks to address a gap in past literature, addressing the impact on growth rates across all countries as affected by types of banking institutions. A broad data set of panel data including 211 countries across 16 years is

used to estimate the relationships between national growth rate and factors using ordinary least squares (OLS) with fixed effects.

This paper is organized as follows. First a background outlining the principles and development of Islamic economics, and specifically Islamic banking, is provided for those unfamiliar with additional information on inputs that alter economic growth rates. Next, a brief literature review summarizes the past contributions of several key researchers that this work attempts to complement. Next is a review of data and methodology, followed by test results and analysis before a conclusion summarizing the key ideas of the study.

II – Background

A) What is Islamic banking?

Islamic banking is the practice of holding and loaning money in a way that does not compromise traditional Shari'a law. It is most exceptional when compared to western banking institutions for its avoidance of interest rates (usury). It is important to distinguish that Islamic banks are not religious institutions in the sense of a church or other proselytizing organization, but are instead profit-oriented companies that function within the constraints of religious law and conform to Islamic economic thought.

To function as a bank under Islamic religious law these institutions have developed four cornerstone practices differentiating Islamic banks from their western counterparts. These cornerstones are the prohibition of interest, the prohibition of chance, ban on *haram* activities, and required charitable donations.

1- *Riba* (The Prohibition of interest) is the most significant divergence from traditional banking practices. The belief (shared by ancient and medieval Christians) that interest leads to exploitation and abuse on the part of the lender makes interest immoral. The time value of money is still recognized in Islamic banking, but is often only recognized only in real transactions.

2- The prohibition of chance (*gharar*) and games of chance (*maysir*) in Islamic banking ban speculation. This is based on the moral principle that increasing one's wealth by chance rather than productive effort is to be discouraged. The realities of the modern economy blur chance and risk-taking, so that in reality it is only investment or participation in avoidable risk that is forbidden.

3- As all banks are subject to national and international law, Islamic banks also make themselves subject to Islamic religious law. Specifically prohibiting involvement in illegal (*haram*) activities, limiting bank investment and loans only directed towards *halal* (legal) activities. Islamic banks are not supposed to lend to companies or individuals involved in activities deemed to have a negative impact on society (for example, gambling) or that are illegal under Islamic law (for example, financing construction of a plant to make alcoholic beverages). Unlike national and international law, however, there is no outside policing force beyond independent Shari'a compliance evaluators to punish or track observance to Shari'a law.

4- Charitable payment of a portion of bank profits to benefit society (*zakat*) to encourage equal opportunity and societal fairness. Giving zakat is aligned with one of the five pillars of Islam, and is commonly set at 2.5 percent of assets held by the bank, and is often given directly to religious organizations (Cihak).

B) *History and Foundations of Modern Islamic Law*

Islamic economics is the area of study that "identifies and promotes an economic order that conforms to Islamic scripture and traditions" (Kuran). The origins of Islamic economics relate back to the founding of the religion of Islam, and have been practiced to varying degrees in the majority Muslim states. The framework of Islamic economics is drawn from the Quran, Sunnah, and Jurisprudence. Each of these three sources forms a cornerstone of contemporary Islamic economics that is both interconnected and stands alone.

The Quran holds the highest position in Islamic law, and is viewed as the literal word of God as revealed to the prophet Muhammad. Compared to other holy books, the Quran is notable for a greater focus on law, the cosmos, and nature of the universe. The influence of this abundance of religious law can still be seen in modern day Islamic regions where concepts of human rights and property originate from religious law. The final version of the Quran used today was compiled by the first Caliph Abu-Bakr using a method of dual-verification (Seyyed). Since then the text has been copied directly and remains the backbone of all Islamic law.

The Sunnah, literally, 'the well traveled road,' are the reported actions and sayings of the prophet Muhammad. By relating familiar problems and how the prophet handled them, and straying from the high rhetoric of the Quran, the Sunnah establishes a code of conduct that Muslim adherents may find more applicable to real world problems as it related to real issues faced by the religion's founders. From these stories, the sayings, practices and approval of others' choices, voiced or silent, are recorded as guideposts for dealing with common problems.

Most influential to modern Islamic law is Jurisprudence, to form one's own judgment. Functioning similar to the role of precedence within the American legal system, rules established using Jurisprudence often become established cultural norms. Jurisprudence was made necessary as problems arose after the death of the prophet Mohammad that was not specifically addressed in either Quran or Sunnah. This gap in direction necessitated officials to deduce rules as best fit situations, using Quranic and traditional texts as references, justifying their laws (Seyyed).

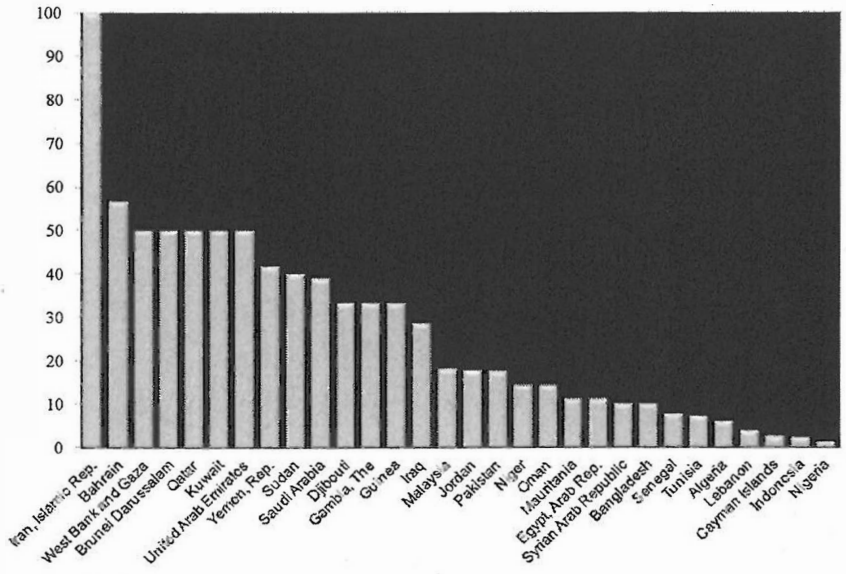
C) Spread and Application of Modern Islamic Banking

The earliest recognizable use of modern Islamic banking practices originated in Egypt in 1974, when the Islamic Development Bank (IDB) was established on the principle of profit sharing, that is interest free in following Shari'a law. In profit sharing these early banks and their clients behaved more as partners than traditional western banks function. Only functioning on a modest scale, these early banking experiments

aimed to satisfy the demands of devout Muslims for capital storage and transfers while maintaining complete Shari'a compliance. By the 1980s Islamic banking had grown into a global industry, predominantly as a result of private initiatives. It was also during this phase that the Iranian government banned all non-Shari'a compliant banks within Iran's borders and replaced interest with service charges of 4-8% and guaranteed minimum profits at the cost of personal choice (Imam).

The face of Islamic banking changed over the years as it spread geographically and in services provided, but non-payment of interest remained the cornerstone of Islamic banking. Islamic finance continued to pride itself on respect of property rights, sanctity of contracts, and the rules of sharing risk that were not exploitive in the manner they deemed Western practices to be. In 1985, the High Council of Organization of Islamic Conference declared *takaful*, Islamic insurance, as Shari'a compliant allowing a new, wider spectrum of Islamic finance. As new frontiers opened, financial institutions expanded beyond basic banking activities and entered capital markets, using capital formation and other financial instruments and foreign intermediaries. A rising degree of uniform standards began in 1991 when the Accounting and Auditing Organization for Islamic Financial Institutions was established to advise institutions on Islamic finance standards all over the world. Uniformity has further been established when in 2002, with the organization of the Islamic Financial Services Board in Malaysia, among other regulatory bodies began setting standards that partners in the Gulf States, Africa, and Europe match (El-Ashker).

Figure 1: Share of Islamic Banks in Total Banking System in Selected Countries, 2006
(Percent)



Source: Bankscope

Figure 1 displays the spread of Islamic Banking institutions by country at the end of the period examined in this study. Ignoring the outlier of Iran, wherein all western style commercial banking is illegal, we see a growing industry that rarely breaks a fifty percent hold on the market in most countries. In addition, the Islamic Banking sector appears strong in the gulf region and with notable holds in African nations with sizable Muslim populations. Geographically, of the 176 Islamic banks in the Bankscope database for 2006, 70 percent are located in Middle Eastern countries, 14 percent in Southeast Asia, and 15 percent in Sub-Saharan Africa (Imam).

D) Functional Differences: Islamic and Western Banking

Islamic Banks share the same purpose as western banks, the creation of profit on lending out capital, but are constricted by the additional burden of religious law. In order to function these institutions utilize profit and loss sharing methods analogous to the Islamic concept of *Mudharabah*" Mudharabah summarizes the relationship between two trade partners, and prescribes that payments may be made to business as investment partners. The partners must than prioritize each other's interests and may not place conditions on the future repayment of the loan. Profits made from investments are distributed using a

fixed ratio. Management of the investment is the sole responsibility of the bank, while the assets acquired for the project are owned by the financier (Rashid).

Cost Plus financing is a common financing technique used by Islamic banks in which the bank agrees to buy an asset from a third party at the request of the client, and then re-sells the goods to its client at a mark-up in order to earn a profit. This is often used for large loans for home buyers and car purchases. While unique from the interest based loans offered by commercial banks. The uniqueness in the structure of cost plus financing is mostly nominal with the bank technically owning the good until the client pays the debt plus mark-up. Commercial banks functionally accomplish the same issue through repossession, making immediate sensitivity to fluctuations in interest rate the biggest difference between the two bank loan strategies (Mputhia). Regardless of effectiveness, a demand for the loans certainly exists, allowing for the quick expansion of the industry that has been seen in the last few years.

But do these added hurdles alter their efficiency as banks? Despite strong growth, many Islamic banks have not been consistently profitable. Since the global financial crisis, challenges facing Islamic banking have only been compounded by the overall weak market. As discussed, there are structural factors that appear responsible for increasing the complexity of transactions over those offered by commercial banks. Higher development and manufacturing costs create notable weaknesses in these banks. Due to the relative youth of the industry, it is believed that Islamic banks in general possess a less experienced (or simply less effective) management team on average making a challenge (Garbois et al.).

E) Choices in Government Policy

Monitoring and regulating banks is a key function of most governments, with varying levels of involvement across different countries. Policies vary greatly among general bank regulations, with varying levels of control, corruption, and extreme outliers like Switzerland which allow bank secrecy or fundamentalist governments outlawing certain actions. Regulation becomes even more difficult when alternative forms of banking such as Shari'a compliant practices enter the market. Due to differing

interpretations on the acceptability of certain products (interpretations of haram and 'acceptable risk') arising from disputes within Jurisprudence, varying national laws create a major gap in standardization in Islamic bank practices. Standards provided by the Bank Negara, Malaysia's central bank, have become a rising standard in recent years, but it is important to consider the crudeness of this young and developing industry when analyzing its economic impact (Garbois et al.).

Some fundamentalist governments have gone so far as to ban all non-Shari'a compliant banking organizations. Iran is an example of this, when in 1979 the revolutionary government nationalized all banking operations and enforced strict Shari'a compliance. The full effect of a government limitation on bank variety raises an interesting concept: namely that a state can 'choose' a mode of banking which it believes to be most capable of spurring growth, trade, and overall societal welfare. Should a less fundamentalist government choose, or be allowed to choose, one banking system over another for economic reasons, the overall impact may be positive. Choosing for cultural reasons, however, seems shortsighted and constraining to personal economic freedom.

In contrast, governments such as Malaysia and the United Kingdom have performed exceedingly well with a dual banking infrastructure (dual in that both Islamic and conventional banks operate in the market, not in the American banking sense). Allowing consumer choice may provide the best incentives, allowing Islamic banks to capture consumers who ordinarily would not have become involved in savings and loans, while non-sensitive consumers may have the option to choose the bank they believe most capable of meeting their goals. A specific challenge for these mixed banking economies is to regulate these two unique systems in a way which does not favor one banking system over the other, creating a market imbalance through favoritism towards a particular system. In potentially encouraging banking activity, Cihak suggests that larger Islamic banks are more vulnerable to risk than equal size commercial banks (Cihak).

F) Growth Rates

Real gross domestic product is the market value of all final goods and services produced within a country in a given period accounting for inflation. The growth of real GDP reflects a growing economy and can be impacted by a variety of factors including resource availability, government action, and existing institutions. For Islamic banks, the greatest argument for their ability to encourage greater growth is their ability to incorporate conservative Muslims, who otherwise are unable to participate in interest based banking. Being able to serve as banks to the 'unbankable' allows Islamic banks to encourage money transfers to and from segments of the population ordinarily ignored.

The economic growth rate of a country is crucial to the lives of its current and future inhabitants, in addition to being beneficial to neighboring nations who benefit as potential trading partners. Economic growth is defined as the increasing capacity of the economy to satisfy the wants of goods and services of the members of society and is the result of productivity levels and changing technology. A growing economy creates opportunities for the exchange of ideas and resources, compounding the growth of other countries and has been associated with reducing the poverty gap within a country. (Kendrick).

G) Islamic Religion itself as a Factor?

The existence of Islamic banking may also serve to complement an existing conventional bank structure and help diversify systemic risk. In conventional banks, when a bank gives out a loan, the borrower bears all risks, except in the case of bankruptcy. In Islamic banking, both bank and entrepreneur share the rewards and failure. In many developing countries risk sharing may allow entrepreneurs with little savings to undertake projects they could not contemplate in an environment where all the risk lies on them. In conventional banking, the creditworthiness of the borrower is the main determinant of the lending decision, and banks are interested in the interest and principal on the loan. In Islamic banking, because profits and losses are shared, banks will receive a return only if a project is successful. Therefore, Islamic banks are more prone to finance sound projects, even if the entrepreneur has no credit history.

The natural downside is that Islamic banks are more prone to systematic risk in the marketplace due to their more limited investment opportunities (those involving forbidden 'haram' activities).

Contemporary thinking on the impact of Islamic institutions contains a great deal of debate. Timur Kuran, author of the 1997 article "Islam and Economic Underdevelopment: An Old Puzzle Revisited," is one of the most outspoken researchers to suggest that economic growth in the Middle East has been limited by Islamic institutions. Specifically these limitations originate first from Islamic laws of inheritance, which divide wealth very evenly discouraging capital accumulation, and secondly a lack of institutional transformation away from economic models which functioned very well during medieval times but proved uncompetitive in the modern global economy. Lastly the *waqf*, a form of trust in which land and resources are held by charitable and religious organizations which can effectively lock resources out of the marketplace (Kuran).

III - Literature Review

Within the existing body of literature, this study seeks to reexamine some basic assumptions on the impact of banking systems on the growth of an economy while holding all other variables constant. Past research has analyzed the growth and changing face of Islamic banks, as well as empirically examined the impact on growth stability caused by bank type. This paper seeks to address growth specifically, and explore if growing use of Islamic banks is beneficial to the overall health of an economy. This is especially important considering the high concentration of Islamic banks in developing nations.

In the research article "Islamic Banks and Financial Stability: An Empirical Analysis" by Cihak and Hesse, the financial strength of Islamic banking systems is assessed empirically in order to determine the impact of their presence on a nation's economic stability. Focusing on a selection of 20 nations, the authors examined the banking systems and the proportion of commercial to Islamic banks. The overriding conclusion of Cihak and Hesse's research was that the market share of Islamic banks does not have a significant impact on the financial strength of other banking systems. Their findings suggest

diseconomies of scale for Islamic banks, which they believe reflects challenges of credit risk management in large Islamic banks. The result being that small Islamic banks tend to be financially stronger than large Islamic banks.

Islamic Economics (A short history) by El-Ashker and Wilson explains in detail the growth, and changing face of Islamic economics. As a facet of Islamic economics, Islamic banking has the most real world application in the free market outside of theocratic governments such as Iran. The authors provide excellent breakdown of the religious and cultural origins of Islamic economics, and how they relate to real world issues such as interpretation.

In "Islamic vs Conventional Banking: Business Model, Efficiency, and Stability" the authors Beck, Merrouche, and Demirgüç-Kunt compare conventional and Islamic banks' influence on their local economy. This particular study found Islamic banks more stable but less cost effective, but found that overall there existed little significant difference between the bank types. The authors cite the influence of the high standards imposed by internal review panels and outside accrediting agencies, which enforce a conservative business model of high reserve rates which may pad against recessionary risk.

Imam and Kpodar's "Islamic Banking: How has it diffused?" paper investigates the determinants of the spread of Islamic banking around the world. The authors find that the additional hurdles presented by the Islamic banking business model, namely high reserve rates and outside accreditation, improve bank quality. By incorporating Shari'a law, the authors suggest that Islamic banks make themselves immune to many of the effects of poor functioning judiciaries and bureaucracies which plague developing nations. Through Shari'a law these banking institutions can to some extent circumvent local rule, settling disputes through the international law of Islamic jurisprudence and allowing bank development without waiting for national reform. The author's findings also suggest that Islamic banks serve as complements to, rather than substitutes for, conventional banks.

IV - Data and Methodology

The bulk of data used to obtain the econometric results listed below comes from the databanks of The World Bank, International Monetary Fund, and Bankscope. Specifically, no small amount credit is due to Dr. Patrick Imam and Dr. Kangni Kpodar of the International Monetary Fund's African Department, whose data and assistance were invaluable towards data collection and use. All country rating data originates from The Heritage Foundation, Freedom House, and Frazer Institute.

The growth and banking systems of 211 countries are used in a time period of 16 years, spanning from 1990 to 2006. The nations used are not limited to the Middle East, Southeast Asia, or other hotbeds of Islamic banking, but span the entire globe. Gaps in data collection, in large part due to the poverty and turmoil in many of the countries studied, was a recurring challenge. To deal with this problem multiple regressions were run in order to exclude the variables that, using theory, appeared necessary to a working model of GDP growth rate change but proved challenging to retain without dropped observations.

The growth rates and levels of volatility in a market are critical to the living standards of a country's citizens. In the long run a stagnant or unstable market can destroy untold lives through a lack of access to clean water, quality medical care, and disaster relief. As the majority of the world develops, it is crucial to motivate discussion on the subject of growth.

$$Y_{it}[GROWTH] = \alpha + \beta_1 Open_{it} + \beta_2 Bank_{it} + \beta_3 Def_{it} + \beta_4 LOAN\,ISL_{it} + \beta_5 LIB_{it} + \beta_6 GOV_{it} + \beta_7 rINT_{it} + \beta_8 EDU_{it} + \beta_9 BUSIFREE_{it} + \beta_{10} OIL_{it}$$

In the above model a rough sketch of what motivates growth is assembled, where GROWTH represents real growth of a country's gross domestic product in a given year. It is hypothesized that the following factors are likely to influence a nation's development. Variable terminology and definitions can be found in Table A.

Table A: Independent Variables			
Variable Name	Abbreviation	Definition	Expected Sign
Trade Openness	OPEN	Trade as a percent of GDP by country i, per year t	+
GDP Banking	BANK	Bank Deposits as a percent of GDP by country i, per year t	-/+
Government Deficit	DEF	Central government balance as a percent of GDP by country i, per year t	-/+
Percent of Loans Islamic	LOAN ISL	Bank loans from Islamic Banks as a percent of total bank loans by country i, per year t	-/+
Liberty Ranking	LIB	National rank on civil liberties by country i, per year t	-/+
Government Size	GOV	General government final consumption expenditure (% of GDP) by country i, per year t	-/+
Real Interest Rate	rINT	Real interest rate as a percentage in country i, per year t	-/+
Primary Education	EDU	School enrollment in primary education as a percent of gross by country i per year t	-/+
Business Freedom	FREE	Degree of business freedom in country i, per year t	-/+
Oil Price	OIL	Average price of oil in country i and year t	-/+
Tariff	TAR	Average tariff level in country i and year t	-/+
Urban Population	URBAN	The percent of total population living in urban areas in country i, per year t	-/+

Trade openness (OPEN) as measured by trade as a percent of GDP is expected to be positive based on overwhelming evidence and supporting trade theory. Holding all else equal, a high amount of nonblack-market participation in the international market suggests a level of interconnectedness to foreign business, institutions, and access to technology. In an extremely corrupt nation, trade with outsiders also represents an escape from the controlled market via the less regulated international marketplace. Data was provided by Imam and Kpodar (2010).

Bank deposits as a percent of GDP (BANK) is included to represent the overall level of activity in the banking sector of a given country in the year sampled. The overall impact of this is uncertain as an increased amounts of currency held in deposits may be a sign of slow velocity in countries with high reserve requirements. However, a higher percent of GDP in the form of bank deposits may also represent a more mature financial industry. Data was collected from Bankscope.

Government deficit (DEF) measures the central government balance as a percent of GDP. Its effect is uncertain, although the measure can generally be seen as measure of the government's control and efficiency suggesting a negative positive relationship with growth. Data was collected from the World Bank database.

The **percent of loans through Islamic Institutions** (LOAN ISL) variable is used to gain a sense of the overall banking activity passing through Islamic institutions. The predicted sign of this variable is the key question in this study, and is unpredicted. Due to the addition of self imposed religious law, it is reasonable to assume that Islamic Banks may suffer from additional overhead and overall lowered efficiency. The data was collected from Bankscope.

Liberty Ranking (LIB) represents the civil liberty rating granted to a country by Freedom House. This number is a summary of the overall protection from state terror, unjustified imprisonment, torture, gender equity, and ethnic and religious rights. The impact of increasing personal liberties is traditionally viewed as a positive. The data was collected from Freedom House.

Government size (GOV) measures the general government final consumption expenditure as a percent of total GDP. Larger government expenditure would suggest a more centralized economy, or possibly one so small that the government makes up a larger portion relative. Government size is unpredicted as the ultimate impact of government spending as compared to crowding out effect on the economy is difficult to state with exactness. Data provided by Imam and Kpodar (2010).

Real interest rate (rINT) represents the real interest rate in the given year for the country. Interest rates have a strong effect on household's willingness to save depending on how favorable the rate is. Identifying the impact of interest rates on growth and as effectors of banking activity is important to creating a working model. Although Islamic banking institutions do not use interest themselves, they are sensitive to changes in the interest rate since they must directly compete with commercial institutions. The data was obtained from the World Bank World Development Indicators.

Enrollment in primary education (EDU) measures the percent of total school age children who attend basic schooling. The impact of this is unpredicted, firstly because school attendance does not guarantee the lessons learnt in class are applicable in the immediate environment. Second there exists a lag period between educating young students, and them entering the market at matured adults. Enrollment in this study is used to gain a general sense of educational attainment. The data was obtained from the World Bank World Development Indicators.

The rated **business freedom** (FREE) of a country, as obtained by Heritage Foundation, is determined from choices allowed to business owners. Business freedom effectively captures level of economic freedom allowed. Sign is unpredicted but using public choice theory it can be assumed that a more open, fair marketplace will produce superior results. Examples such as Hong Kong exemplify the power that opening a market can have on growth rate. This data was collected from the Heritage Foundation.

Oil price (OIL) as measured in real United States dollars is used in this study to account for the impact of resource prices on economic growth. Oil is also a major export of several nations studied, particularly the

Gulf States. The overall impact of oil price is undetermined as the price of oil can change in response to greater demand or changes in supply or conversely the market may respond negatively to increases in oil availability and price. Data was gathered from the International Monetary Fund.

Percent of population living in urban environments (URBAN) variable is used to measure the overall level of urbanization within a given country. Although not specified, urbanization is often connected with increasing industrialization and improved standards of living. However in many nations urban movements reflect a flight from even poorer performance in rural regions. The data was collected from the World Bank Database.

V - Regression Results & Analysis

Econometric results are divided into three sections, first a basic comparison of growth rates with the single dependent variable of LOAN ISL. Second the full econometric model is run including tariffs (TAR) and business freedom (FREE). Third the model is run having removed tariffs and business freedom. Gaps in data availability made dropped variables a major challenge, especially for the important variables of business freedom and tariff levels. By excluding those variables that seem necessary to a working model of GDP growth rate the model was able to run without dropping large numbers of observations.

Table 1: Determinants of GDP Growth:
Basic Look at Islamic Loans and Growth

Variable Name	**Coefficient**	**P>|t|**	**T statistic**
LOAN ISL	.0000343	.89	.14
Constant	.0334267	.00	61.69
R-Squared= .17	Adjusted R-Squared=.101	Obs= 1706	

*-Significant at 10% **- Significant at 5% ***- Significant at 1%

Table 1 displays the results of the basic regression of yearly GDP growth rates in the given country, and the percent of loan transactions through Islamic banking entities. The results show a relationship that is

minimal at best, with an R squared of zero. This very basic sample agrees with the findings of Cihak and Hesse, suggesting that there exists no notable connection between alternative banking and altered growth patterns.

Table 2: Determinants of GDP Growth:
Including Tariff Level and Business Freedom

Variable Name	**Coefficient**	**P>ltl**	**T statistic**
Open	.0005565	.099*	1.67
BGDP	-.085265	.052*	-1.97
DEF	.0012333	.368	.91
LOAN ISL	-.0076672	.344	-.95
LIB	-.0087192	.075*	-1.81
GOV	-.0002599	.891	-.14
rINT	-.0000891	.842	-.2
OIL	.0016369	.001***	3.33
TAR	-.0081347	.035	-2.15
FREE	.002866	.484	.7
URBAN	-.0041666	.037**	-2.12
Constant	.2836736	.009***	2.69
R-Squared=.395	Adjusted R-Squared=.206	Obs=349	

*-Significant at 10% **- Significant at 5% ***- Significant at 1%

In Table 2 the full equation is used. In the fixed effects OLS regression used, the impact of Islamic banks is not significant. The connection is insignificant with (as shown above) and without robust standard errors. The number of observations drops significantly due to holes in data availability, which is accounted for the in Table 3 where the two weakest variables are dropped.

The significance of tariffs (TAR) at the five percent level, and openness to trade at the ten percent level, make logical sense together. As nations trade they are allowed to specialize where they are most capable, exploiting comparative advantage. The negative coefficient on increasing trade tariffs supports this assumption, along with the positive relationship between real GDP growth and expanded market openness.

Surprisingly oil price (OIL) is positively correlated to growth, meaning that a single unit increase in the price of oil would be matched by a corresponding rise in real GDP growth rate (of .0016369). While this may conflict with our initial assumptions that high gas prices discourage use, it makes sense in the context of a high growth economy where demand for oil would be very high, raising the price. In addition, oil producing nations make up a sizable part of this study and may also bias the relationship.

The results of the percent of total population living in urban areas (URBAN) are surprising. An increasing urban population is typically associated with high growth rates, but in Table 2 it is shown to be not only significant, but negative towards overall GDP. This is possibly an error in the equation, but some researchers do argue that national policies and non-democratic institutions promote over centralization to an extent in which the urban population of a country is focused into one or two major metropolitan areas (Henderson). When run without URBAN variable, R-squared drops, suggesting that the overall accuracy of the equation benefits from including the urbanization variable as can see in Table A.1 in the appendix.

Several econometric tests were run to judge the validity of the regression; the results for Table 2 Tests can be found in Section C.2 of the appendix. To account for heteroskedasticity in the panel data, a Modified Wald test for groupwise heteroskedasticity was run. The Wald test found no significant heteroskedasticity issues. Running a Wooldridge test for autocorrelation on the panel data, the results come out higher than other tests, suggesting that the variables for Tariff level (TAR) and business freedom (FREE) suffer from autocorrelation issues and are excluded in the third regression. VIF test was also run with low levels of multicollinearity detected. Running a Ramsay RESET test, including right hand side variables revealed

some signs of significant omitted variable bias suggesting that the intricacies of the economy are not being fully captured.

Table 3: Determinants of GDP Growth: Excluding Tariff Level and Business Freedom			
Variable Name	**Coefficient**	**P>ltl**	**T statistic**
Open	.0003273	.031**	2.18
BGDP	-.590622	.027**	-2.25
DEF	.0008108	.412	.82
LOAN ISL	5.45e	.987	.02
LIB	-0059438	.071*	-1.82
GOV	-.0005272	.33	-.98
rINT	-.0004571	.004***	-2.93
OIL	.0006708	.016**	2.46
URBAN	-.0006568	.484	-.7
Constant	.0979971	.023**	2.31
R-Squared= .198	Adjusted R-Squared=.123	Obs= 1236	

*-Significant at 10% **- Significant at 5% ***- Significant at 1%

In Table 3, overall R-squared drops, suggesting that the omitted variables of tariff (TAR) and business freedom level (FREE) capture something relevant to real GDP growth rate level. The number of observations rises due to blanks in knowledge of many of the poorer nations the previous regression suffered from being less strong with the removal of the two variables. Corraborating the previous regression, the percent of loans through Islamic institutions is not significant. The overall level of significance has fallen even farther towards improbability.

Rising interest rates appear to have a negative impact on Islamic banking, reflecting the ability of customers to fly to conventional banks as best benefits them. If interest rates are low than less devout

Muslims are more likely to invest in Islamic banks, but when interest rates are high, those same less devout Muslims will seek to place their money in a commercial banking institution to better capitalize on the high price of money. The opportunity cost may represent an outflow of a countries capital to foreign banks when Islamic banking institutions are predominant.

Tests for heteroskedasticity, autocorrelation, and multicolinearity were run for the Table 3 regression, and can be seen in section D.2 of the appendix. The Wald test found no significant heteroskedasticity issues for Table 3, while the Wooldridge test for autocorrelation the results came out far lower suggesting that at least one of the two dropped variables suffered from significant autocorrelation with another variable. The VIF test was used again, and found only low levels of multicollinearity. Due to amount of missing data, both correlation output and pairwise deleted correlation output are included in section D.2, the only variables coming out with any significant autocorrelations concerns was real interest rate (rINT) and bank deposits as a percent of GDP (BGDP). This is unsurprising as financial organizations are sensitive to cost of money; however, the overall impact of real interest has a unique impact on growing economies and does not replace the BGDP variables ability to capture bank activity.

VI - Conclusion

In this paper we investigate the factors affecting growth rates in countries. Specifically we examine the impact Shari'a compliant (Islamic) banking institutions have on growth. It is important to keep in mind that the industry of Islamic banking is still in its infancy, as seen in its brief history the institutions have changed and grown dramatically in their short period of existence. In the expansion of Islamic banks we see a culture which uses organized religion to full effect, employing religious law as an escape from ineffective and corrupt governments while simultaneously legitimizing themselves to their primary customer base. More effective governments may choose to ban or encourage Islamic banks, but as organizations that organically developed from customer demand, the governments may only succeed in distorting the natural niche market which serves as a complement to conventional banking. Lastly, Islamic

banks can be thought of as agents of change, introducing new concepts to stifled economic environments and replacing old ones such as the trust fund such as the *waqf*.

Through the data and regression analysis we arrive at several key conclusions. First, Islamic financial institutions appear to have little if any effect on real yearly GDP growth rate, with no significant relationship found. The inability to connect the expansion of Islamic banks to any negative impact on growth rates matches the findings of Thorsten and Asli (2010). Second, that trade appears to be highly correlated with economic growth. Both openness to trade (OPEN) and tariff levels (TAR) reflected a strong relationship between a country's level of activity in the global market and a strong growth rate, matching expectations from theory and past research.

If Islamic banking is truly benign to overall economic growth (measured here as real GDP growth rate) then several conclusions can be reached. First that Shari'a compliant banking institutions allow for the capture of certain low hanging fruit, in the form of devout Muslims who forgo commercial banking institutions for religious and cultural reasons. Second, for traditionally Islamic countries these new institutions allow for a break from the traditional issues Timur Kuran addresses, such as the resource locking *waqf* and a slowness to adopt new institutions. Third, as these institutions spread the gap in appropriate regulatory measures will become an increasing issue that must be met in order to protect market fairness and household freedom of choice to select within a diverse financial system.

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Appendix

Section A: Urbanization Excluded

Model run excluding Urbanization variable

```
Fixed-effects (within) regression               Number of obs      =       349
Group variable: cycode                          Number of groups   =        73

R-sq:  within  = 0.1401                         Obs per group: min =         1
       between = 0.0015                                        avg =       4.8
       overall = 0.0082                                        max =         6

                                                F(10,72)           =      2.96
corr(u_i, Xb)  = -0.8972                        Prob > F           =    0.0036

                                              (Std. Err. adjusted for 73 clusters in cycode)
------------------------------------------------------------------------------
             |               Robust
  gdp_growth |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        open |   .0006101   .0003167     1.93   0.058    -.0000212    .0012415
       bdgdp |  -.0944309    .047175    -2.00   0.049    -.1884726   -.0003892
         def |   .0014581   .0014254     1.02   0.310    -.0013833    .0042996
percent_loan_isl |  -.00425   .0084798    -0.50   0.618    -.0211543    .0126542
          cl |  -.0071722    .004776    -1.50   0.138    -.0166929    .0023485
         gov |  -.0007798   .0018209    -0.43   0.670    -.0044096      .00285
       var46 |  -.0000727   .0004544    -0.16   0.873    -.0009785    .0008331
          bf |   .0003137   .0004154     0.76   0.453    -.0005144    .0011418
        oilp |   .0011638   .0004545     2.56   0.013     .0002578    .0020698
      tariff |  -.0095657   .0038884    -2.46   0.016    -.0173171   -.0018142
       _cons |   .0869009     .06672     1.30   0.197    -.0461029    .2199047
-------------+----------------------------------------------------------------
     sigma_u |  .07216497
     sigma_e |   .0339353
         rho |  .81891268   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Section B: Table 1 Basic Model

```
. xtreg gdp_growth percent_loan_isl, fe  vce(robust)

Fixed-effects (within) regression               Number of obs      =      1706
Group variable: cycode                          Number of groups   =       131

R-sq:  within  = 0.0000                         Obs per group: min =         1
       between = 0.0049                                        avg =      13.0
       overall = 0.0010                                        max =        15

                                                F(1,130)           =      0.02
corr(u_i, Xb)  = 0.0646                         Prob > F           =    0.8897

                                    (Std. Err. adjusted for 131 clusters in cycode)
```

gdp_growth	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
percent_loan_isl	.0000343	.0002471	0.14	0.890	-.0004544	.0005231
_cons	.0334267	.0005418	61.69	0.000	.0323548	.0344986
sigma_u	.03163054					
sigma_e	.06092195					
rho	.21232943	(fraction of variance due to u_i)				

```
Linear regression, absorbing indicators         Number of obs     =      1706
                                                F(   1,   1574)   =      0.01
                                                Prob > F          =    0.9369
                                                R-squared         =    0.1701
                                                Adj R-squared     =    0.1010
                                                Root MSE          =    0.0609
```

gdp_growth	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
percent_loan_isl	.0000343	.0004337	0.08	0.937	-.0008163	.000885
_cons	.0334267	.001755	19.05	0.000	.0299842	.0368691
country	F(130, 1574) =		2.466	0.000	(131 categories)	

Section C.1
Table 2: Including Business Freedom and Tariff

```
. xtreg gdp_growth open bdgdp def percent_loan_isl cl gov var46  oilp tariff bf urbanpopulationoftotal,
>  fe  vce(robust)

Fixed-effects (within) regression               Number of obs      =       349
Group variable: cycode                          Number of groups   =        73

R-sq:  within  = 0.1574                         Obs per group: min =         1
       between = 0.0038                                        avg =       4.8
       overall = 0.0198                                        max =         6

                                                F(11,72)           =      2.94
corr(u_i, Xb)  = -0.9814                        Prob > F           =    0.0029

                                    (Std. Err. adjusted for 73 clusters in cycode)
```

gdp_growth	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
open	.0005565	.0003328	1.67	0.099	-.0001069	.0012198
bdgdp	-.085265	.0431779	-1.97	0.052	-.1713386	.0008086
def	.0012333	.0013617	0.91	0.368	-.0014812	.0039477
percent_loan_isl	-.0076672	.0080574	-0.95	0.344	-.0237293	.0083949
cl	-.0087192	.0048264	-1.81	0.075	-.0183404	.000902
gov	-.0002599	.001894	-0.14	0.891	-.0040356	.0035158
var46	-.0000891	.0004442	-0.20	0.842	-.0009746	.0007965
oilp	.0016369	.0004914	3.33	0.001	.0006572	.0026166
tariff	-.0081347	.0037814	-2.15	0.035	-.0156728	-.0005966
bf	.0002866	.0004072	0.70	0.484	-.0005251	.0010983
urbanpopulationoftotal	-.0041666	.0019637	-2.12	0.037	-.0080811	-.000252
_cons	.2836736	.1056066	2.69	0.009	.0731508	.4941965
sigma_u	.15322741					
sigma_e	.03365513					
rho	.95397776	(fraction of variance due to u_i)				

```
Linear regression, absorbing indicators         Number of obs   =       349
                                                F(  11,    265) =      4.50
                                                Prob > F        =    0.0000
                                                R-squared       =    0.3951
                                                Adj R-squared   =    0.2057
                                                Root MSE        =    0.0337
```

gdp_growth	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
open	.0005565	.0002278	2.44	0.015	.0001079	.0010051
bdgdp	-.085265	.0421199	-2.02	0.044	-.1681972	-.0023328
def	.0012333	.0009099	1.36	0.176	-.0005584	.0030249
percent_loan_isl	-.0076672	.0069433	-1.10	0.270	-.0213382	.0060038
cl	-.0087192	.0045662	-1.91	0.057	-.0177098	.0002714
gov	-.0002599	.0014276	-0.18	0.856	-.0030708	.002551
var46	-.0000891	.0003278	-0.27	0.786	-.0007345	.0005564
bf	.0002866	.0003878	0.74	0.461	-.0004769	.0010501
oilp	.0016369	.000447	3.66	0.000	.0007568	.002517
tariff	-.0081347	.003233	-2.52	0.012	-.0145005	-.001769
urbanpopulationoftotal	-.0041666	.0017852	-2.33	0.020	-.0076816	-.0006515
_cons	.2836736	.0973887	2.91	0.004	.0919195	.4754277
country	F(72, 265) =		1.701	0.001	(73 categories)	

Section C.2

Table 2 Tests

Wald Test

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (73)  =    3.5e+30
Prob>chi2 =     0.0000
```

Woolridge Test

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      56) =      0.409
           Prob > F =      0.5252
```

Ramsay RESET RHS

```
Ramsey RESET test using powers of the independent variables
       Ho:  model has no omitted variables
                F(33, 304) =      2.21
                  Prob > F =      0.0003
```

Correlation Output

	gdp_gr~h	open	bdgdp	def	percen~l	cl	gov	var46	bf
gdp_growth	1.0000								
open	0.0702	1.0000							
bdgdp	-0.0042	0.3363	1.0000						
def	0.1509	0.1574	0.0182	1.0000					
percent_lo~l	0.0572	-0.0185	0.0648	0.3179	1.0000				
cl	-0.0076	-0.0135	-0.2457	0.0939	0.1820	1.0000			
gov	-0.0434	0.0975	0.2939	0.1533	0.0874	-0.1544	1.0000		
var46	0.0097	0.3537	0.8918	0.0648	0.0373	-0.2804	0.2865	1.0000	
bf	0.0135	0.3019	0.4505	0.1828	0.0007	-0.3503	0.3097	0.5270	1.0000
oilp	0.1549	0.0684	0.0796	0.0626	0.0052	-0.1637	0.0217	0.0105	-0.0583
tariff	-0.0814	0.1667	0.2210	0.2816	0.0728	-0.2903	0.1368	0.2586	0.3318
urbanpopul~l	-0.1441	0.1460	0.2559	0.3550	0.1115	-0.1890	0.2202	0.2648	0.3295

	oilp	tariff	urbanp~l
oilp	1.0000		
tariff	0.1183	1.0000	
urbanpopul~l	0.0429	0.3615	1.0000

Pairwise Deletion Correlation Output

	gdp_gr~h	open	bdgdp	def	percen~l	cl	gov
gdp_growth	1.0000						
open	0.0989	1.0000					
bdgdp	-0.0511	-0.0605	1.0000				
def	0.1368	0.0785	-0.0618	1.0000			
percent_lo~l	0.0317	-0.0370	0.0176	-0.0340	1.0000		
cl	0.0268	-0.1456	-0.1294	-0.0733	0.2655	1.0000	
gov	-0.1317	0.1528	0.0649	-0.1137	0.0868	-0.1675	1.0000
var46	-0.0301	0.2171	0.0975	0.0837	-0.0263	-0.4586	0.1792
bf	-0.1122	0.2018	0.0776	-0.0014	0.0275	-0.4801	0.3161
tariff	-0.0302	0.3148	0.1488	0.2049	0.1008	-0.3928	0.2657
oilp	0.1335	0.1133	0.0167	0.2189	-0.0321	-0.0909	-0.0480
urbanpopul~l	-0.0046	0.1797	0.0748	0.0842	0.0844	-0.2691	0.1544

	var46	bf	tariff	oilp	urbanp~l
var46	1.0000				
bf	0.5566	1.0000			
tariff	0.4054	0.2903	1.0000		
oilp	0.0900	-0.0657	0.1090	1.0000	
urbanpopul~l	0.3973	0.3402	0.4517	0.0428	1.0000

.VIF Test

Variable	VIF	1/VIF
var46	5.60	0.178504
bdgdp	5.23	0.191055
bf	1.72	0.581778
def	1.42	0.702951
cl	1.39	0.719058
urbanpopul~l	1.36	0.735086
tariff	1.34	0.744806
open	1.24	0.808952
percent_lo~l	1.18	0.849205
gov	1.18	0.850069
oilp	1.10	0.906080
Mean VIF	2.07	

Section D.1

Table 3: Excluding Tariff and Business Freedom

```
. xtreg gdp_growth open bdgdp def percent_loan_isl cl gov var46  oilp urbanpopulationoftotal, fe vce(ro
> bust)

Fixed-effects (within) regression               Number of obs      =      1236
Group variable: cycode                          Number of groups   =        98

R-sq:  within  = 0.0627                         Obs per group: min =         1
       between = 0.0074                                        avg =      12.6
       overall = 0.0068                                        max =        15

                                                F(9,97)            =      7.30
corr(u_i, Xb)  = -0.8695                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for 98 clusters in cycode)
```

gdp_growth	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
open	.0003273	.0001499	2.18	0.031	.0000297	.0006248
bdgdp	-.0590622	.026235	-2.25	0.027	-.1111314	-.006993
def	.0008108	.0009851	0.82	0.412	-.0011443	.0027659
percent_loan_isl	5.45e-06	.0003261	0.02	0.987	-.0006417	.0006526
cl	-.0059438	.0032605	-1.82	0.071	-.012415	.0005275
gov	-.0005272	.0005381	-0.98	0.330	-.0015952	.0005408
var46	-.0004571	.0001559	-2.93	0.004	-.0007665	-.0001477
oilp	.0006708	.000273	2.46	0.016	.0001289	.0012126
urbanpopulationoftotal	-.0006568	.0009343	-0.70	0.484	-.0025112	.0011975
_cons	.0979971	.0425007	2.31	0.023	.0136451	.1823491
sigma_u	.03734998					
sigma_e	.04108479					
rho	.45249096	(fraction of variance due to u_i)				

```
Linear regression, absorbing indicators         Number of obs      =      1236
                                                F(    9,    1129) =      8.39
                                                Prob > F           =    0.0000
                                                R-squared          =    0.1979
                                                Adj R-squared      =    0.1226
                                                Root MSE           =    0.0411
```

gdp_growth	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
open	.0003273	.0001122	2.92	0.004	.0001072	.0005474
bdgdp	-.0590622	.0199334	-2.96	0.003	-.0981729	-.0199515
def	.0008108	.0004035	2.01	0.045	.0000191	.0016024
percent_loan_isl	5.45e-06	.0006852	0.01	0.994	-.0013391	.00135
cl	-.0059438	.0021382	-2.78	0.006	-.0101391	-.0017484
gov	-.0005272	.000491	-1.07	0.283	-.0014905	.0004361
var46	-.0004571	.0001383	-3.31	0.001	-.0007284	-.0001858
oilp	.0006708	.0002437	2.75	0.006	.0001927	.0011488
urbanpopulationoftotal	-.0006568	.0006823	-0.96	0.336	-.0019955	.0006818
_cons	.0979971	.0325547	3.01	0.003	.0341226	.1618716
country	F(97, 1129) =		2.346	0.000	(98 categories)	

Section D.2
Table 3 Test

Wald Test

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (98)  =    3.6e+32
Prob>chi2 =     0.0000
```

Woolridge Test

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      94) =      7.367
           Prob > F =      0.0079
```

Ramsay RESET RHS

```
Ramsey RESET test using powers of the independent variables
       Ho:  model has no omitted variables
               F(27, 1199) =      2.24
                  Prob > F =      0.0003
```

Correlation Output

	gdp_gr~h	open	bdgdp	def	percen~1	cl	gov	var46	oilp
gdp_growth	1.0000								
open	0.1009	1.0000							
bdgdp	-0.0061	0.3252	1.0000						
def	0.1192	0.1180	0.0576	1.0000					
percent_lo~l	0.0558	-0.0496	0.0269	0.0848	1.0000				
cl	-0.0145	-0.1449	-0.3688	-0.0667	0.2919	1.0000			
gov	-0.0431	0.2577	0.2579	-0.0551	0.0861	-0.0874	1.0000		
var46	-0.0137	0.2618	0.8583	0.1153	0.0130	-0.3244	0.1882	1.0000	
oilp	0.0670	0.0860	0.0988	0.0832	-0.0348	-0.1017	0.0243	0.0471	1.0000
urbanpopul~l	-0.0232	0.0449	0.2620	0.1733	0.1220	-0.2334	0.2071	0.2537	0.0632

Pairwise Deletion Correlation Output

	gdp_gr~h	open	bdgdp	def	percen~l	cl	gov
gdp_growth	1.0000						
open	0.0989	1.0000					
bdgdp	-0.0511	-0.0605	1.0000				
def	0.1368	0.0785	-0.0618	1.0000			
percent_lo~l	0.0317	-0.0370	0.0176	-0.0340	1.0000		
cl	0.0268	-0.1456	-0.1294	-0.0733	0.2655	1.0000	
gov	-0.1317	0.1528	0.0649	-0.1137	0.0868	-0.1675	1.0000
var46	-0.0301	0.2171	0.0975	0.0837	-0.0263	-0.4586	0.1792
oilp	0.1335	0.1133	0.0167	0.2189	-0.0321	-0.0909	-0.0480
urbanpopul~l	-0.0046	0.1797	0.0748	0.0842	0.0844	-0.2691	0.1544

	var46	oilp	urbanp~l
var46	1.0000		
oilp	0.0900	1.0000	
urbanpopul~l	0.3973	0.0428	1.0000

VIF Test

Variable	VIF	1/VIF
bdgdp	4.32	0.231588
var46	3.92	0.254942
cl	1.36	0.736923
urbanpopul~l	1.20	0.831964
open	1.20	0.832225
percent_lo~l	1.18	0.849501
gov	1.17	0.853172
def	1.09	0.914636
oilp	1.03	0.969348
Mean VIF	1.83	