

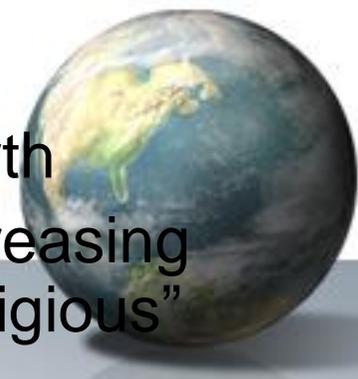
Correlates of International LDS Church Growth and Member Activity: 1997-2017

A Multivariate Regression Analysis



David Stewart
University of Nevada Las Vegas

Background



- Long-term impact of a religion depends greatly on its growth
- Contemporary societal trends in US and Europe show increasing identification as atheists, agnostics, or “spiritual but not religious”
- Decline of mainline churches
- Slowing growth of outreach-oriented faiths
- Existential discussion about the nature of religion and scripture
- Muslims expected to outnumber Christians by 2070
 - Pew Research Center, “The Future of World Religions,” 2 April 2015



Samarkand, Uzbekistan

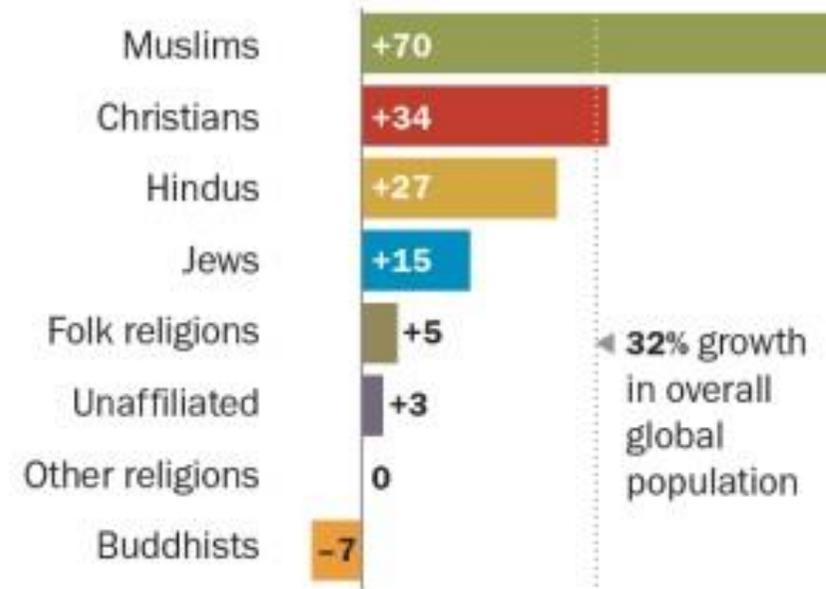


Lutheran Church, Tashkent, Uzbekistan

- Worldwide, proportion of unaffiliated is *declining*
 - Rising disaffiliation primarily in nations with aging populations and low birth rates
- Notwithstanding faster growth of Islam,
- Christianity still growing *faster* than world population

Muslims projected to be fastest-growing major religious group

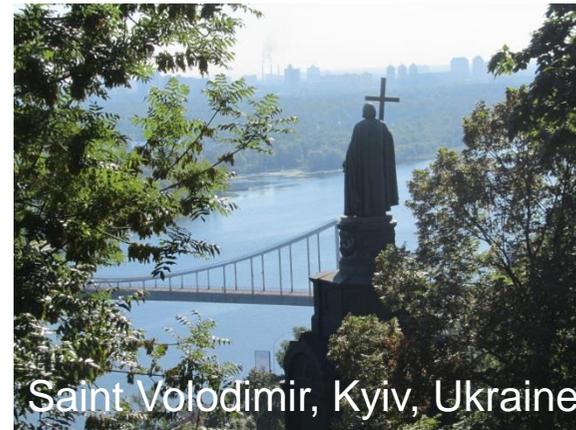
Estimated percent change in population size, 2015-2060



Source: Pew Research Center demographic projections. See Methodology for details.
 "The Changing Global Religious Landscape"

PEW RESEARCH CENTER

Pew Research Center, 4 April 2017



Future Prospects



- Continued growth
- Daniel's "Stone rolling forth to fill the earth"
- vs. stagnation or decline?



Atəşgah *Храм Огнопоклонников*
Ateshgah Temple of the Fire Worshippers
Suraxanı raion, Baku, Azerbaijan

"Tomb of the Prophet Daniel," near Samarkand, Uzbekistan

Why does disaffiliation pose challenges for LDS growth?



Active LDS membership heavily concentrated in low-population growth nations of North America, Europe, and Oceania.

Over 70% of full-time LDS missionaries come from a single nation (United States)

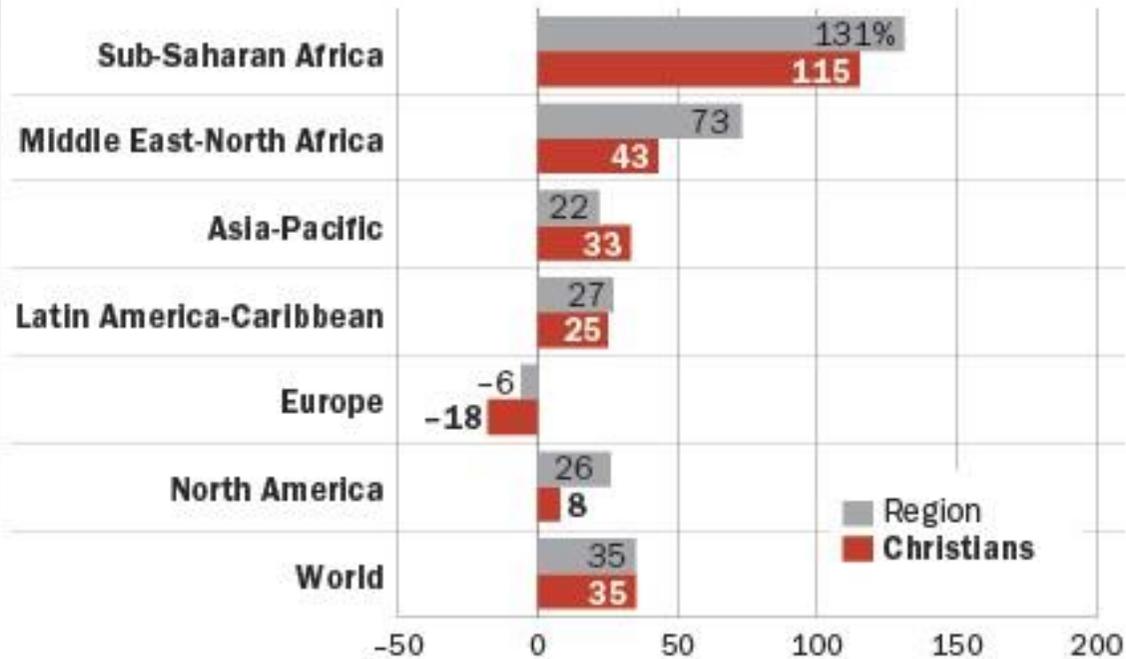
Decline in retention of U.S. children raised in the LDS Church has implications for international as well as national growth

Latin America population growth below world average and “in the red” across Protestant denominations throughout 20th and early 21st centuries (net importers of missionaries and resources)

Low LDS membership in Christianity’s contemporary growth centers (Sub-Saharan Africa, Middle East, Asia/Pacific) and net missionary exporting countries (India, Republic of Korea)

Christian Population Growth Compared With Overall Growth in Each Region, 2010 to 2050

% increase in population size



Source: The Future of World Religions: Population Growth Projections, 2010-2050

PEW RESEARCH CENTER

Pew Research Center, 27 March 2015

Low diversification (uneven member distribution) decreases overall growth while increasing risks.

Putative Correlates of LDS Church Growth



- Extrinsic (demand-side)
- Human Development Index (HDI)
- Gross Domestic Product per Capita (GDPPC)
- Net migration per 100,000 population
- Average Fertility Rates
- Population Growth Rates
- Urbanization (%)
- Intrinsic (supply-side)
- Member Activity Rate
- Members per Congregation
- National Outreach (% in cities with congregation)
- Hybrid Factors
- Jehovah's Witness annual growth
- Jehovah's Witness preaching hours per baptism (1000s)
- Not Evaluated
- Religious Plurality/Fractionalization
- Specific approaches/programs
- Many others

Data and Sources



LDS Meetinghouse, Reykjavik, Iceland

- LDS national membership and congregation statistics (*LDS Church Almanacs, lds.org*)
- Human Development Index (*UN Development Program*)
- GDP per capita (International Monetary Fund)
- Fertility rates (*UN Population Division*)
- Population growth rates (*World Bank, UN Population Division*)
- Urbanization (*UN Population Division*)
- Net migrants per 100K population (*UN Population Division*)
- JW growth and 1000s of preaching hours per baptism (*Jehovah's Witness annual yearbooks 1982-2017*)
- LDS activity rates, national outreach percent (*Reaching the Nations*)

Methodology

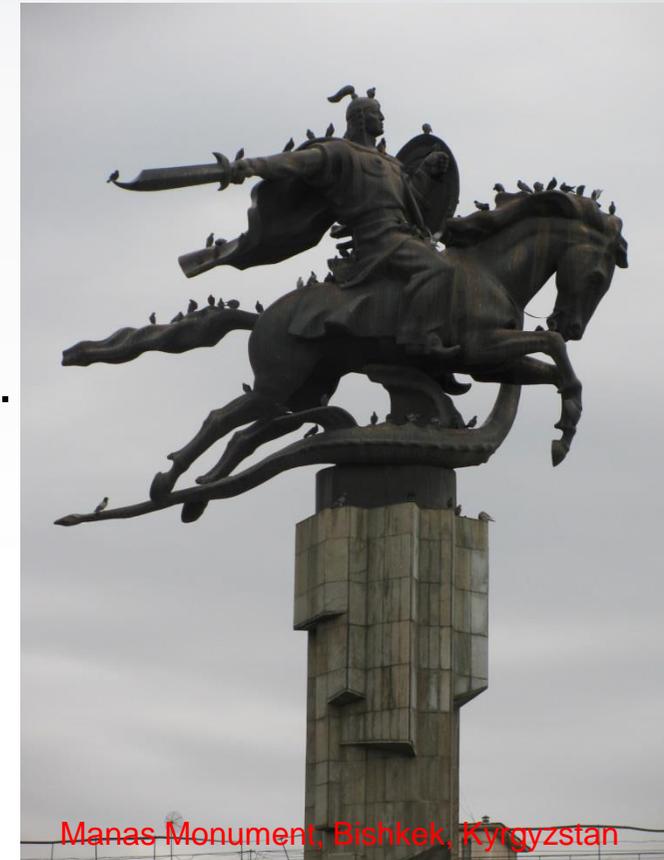


- Compounded annual average 20-year membership and congregational growth rate (1997-2017) for each nation with available data
 - *Average annual growth rate* = $\left(\frac{n_{2017}}{n_{1997}}\right)^{\frac{1}{20}} - 1$
- Separates long-term trends from short-term fluctuations
- Multiple Regression Analysis: MiniTab statistical analysis software
- Single Regression Plots: Microsoft Excel
- Also calculated and regressed 30-year (1987-2017) data

Limitations



- Statistical correlation does not prove causality
- Data and correlations only valid for LDS growth over the period studied (1997-2017) – not other denominations
- Only includes nations with official church presence
- Growth rates have declined markedly over the study period
- Effect magnitudes have changed over time.
- Additional data can mitigate but not eliminate limitations.
- Retrospective with limited predictive value.



Manas Monument, Bishkek, Kyrgyzstan

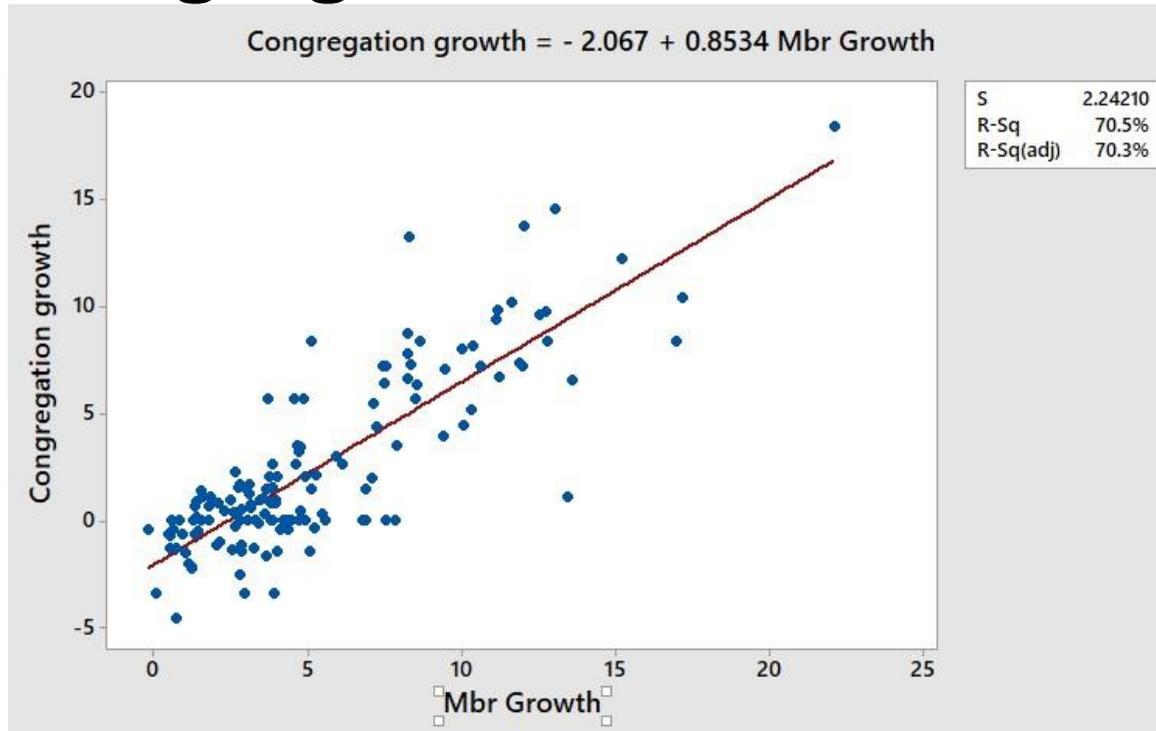
Data Granularity

- Low resolution of large-scale sociological data
- Definitions, assumptions, biases of reported data
- May not accurately represent what is occurring at individual level
- Individual reporting may also suffer from biases (social acceptability bias) or lack of personal insight



Sun and Moon Pagodas, Guilin, China

Congregational vs Membership Growth



LDS meetinghouse, Chisenau, Moldova

Average LDS congregational growth rate = 85% of member growth rate minus 2%

Suggests that LDS membership rolls accrue many non-participating members: address unknown file, inactives, disaffiliated, etc.

A 2% annual LDS member growth rate, on average, corresponds to a congregational growth rate of zero over the study period

Less than 2% annual membership growth rate correlates with average congregation loss

Membership growth predicts 70% of variance in congregational growth

JW and SDA member to congregational growth ratios close to 1:1

Due to higher JW/SDA convert retention and inactives dropped from rolls

Challenges in Evaluating Membership Statistics



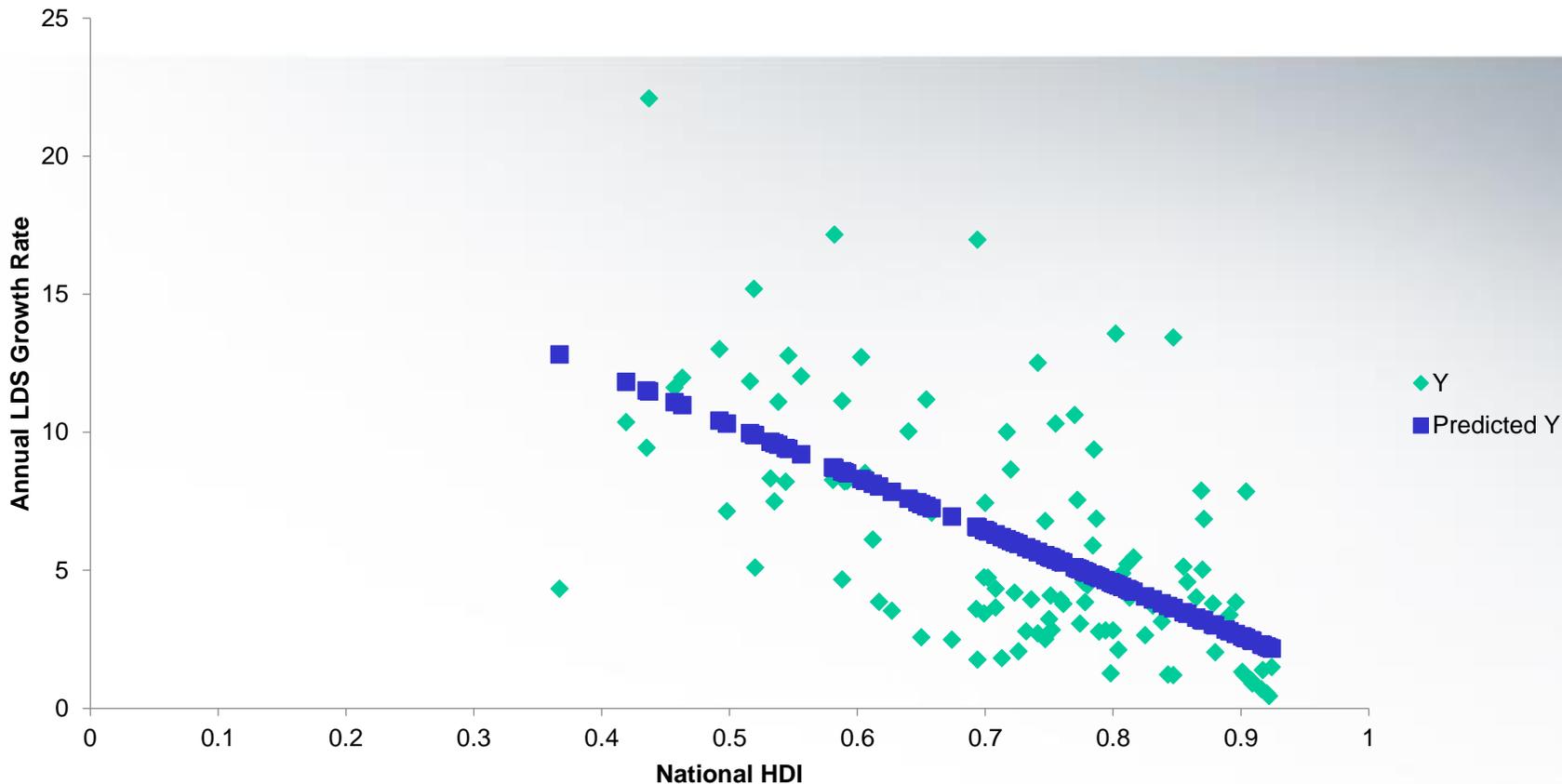
- Official LDS membership statistics have no obligatory relationship to participation or nominal belief
- *Asymmetric Information.* Those reporting the data know what they represent; we do not.
- *Principal-Agent Problem.* Interests of missionaries and mission leaders may not be aligned with interests of converts or the Church
- *Moral Hazard.* Itinerant missionaries lack accountability and are not vested in success of local congregations; others bear the cost of their risk-taking.
- *Perverse Incentives.* System flaws incentivize short-term behaviors
- *Adverse Selection Bias.* Singular focus on baptismal numbers without regard to convert retention has rewarded missionaries and leaders willing to cut corners, sacrifice quality and ethics, and “game the system” at the expense of real growth.
- *Unintended Consequences*

Statistical Terminology

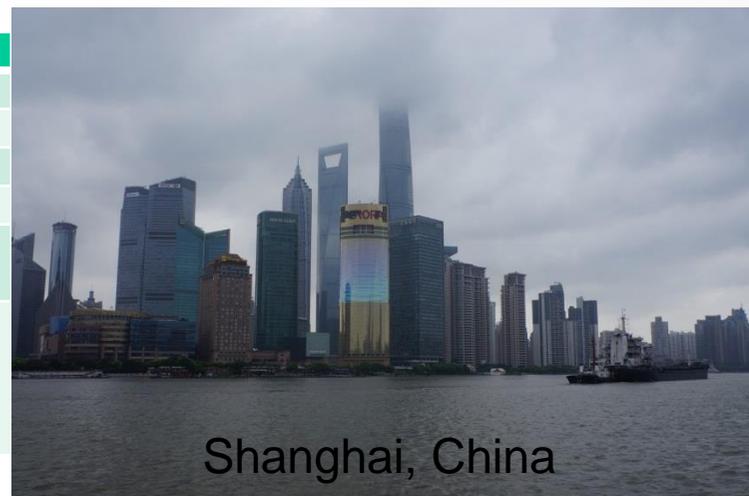


- Multiple R: Correlation coefficient of relationship strength.
0 = no relationship, 1 = perfect relationship.
- R squared: how many points fall on the regression line and are “explained” by the x-value.
- Observations: number of countries evaluated
- X-variable coefficient: magnitude of relationship. A change of one unit in the independent (variable) is expected to correlate with a change in annual church growth rates by this amount.
- p-value: an indicator of statistical significance. The lower the value, the less likely the results are to have been obtained by chance. A threshold of $p \leq 0.05$, or a 5% likelihood of chance association, is used for most statistical analysis.
- Confidence interval: the range between upper and lower effects expected to contain the “true value” of the relationship magnitude within the range of statistical significance (95% likelihood).

Human Development Index (2017)

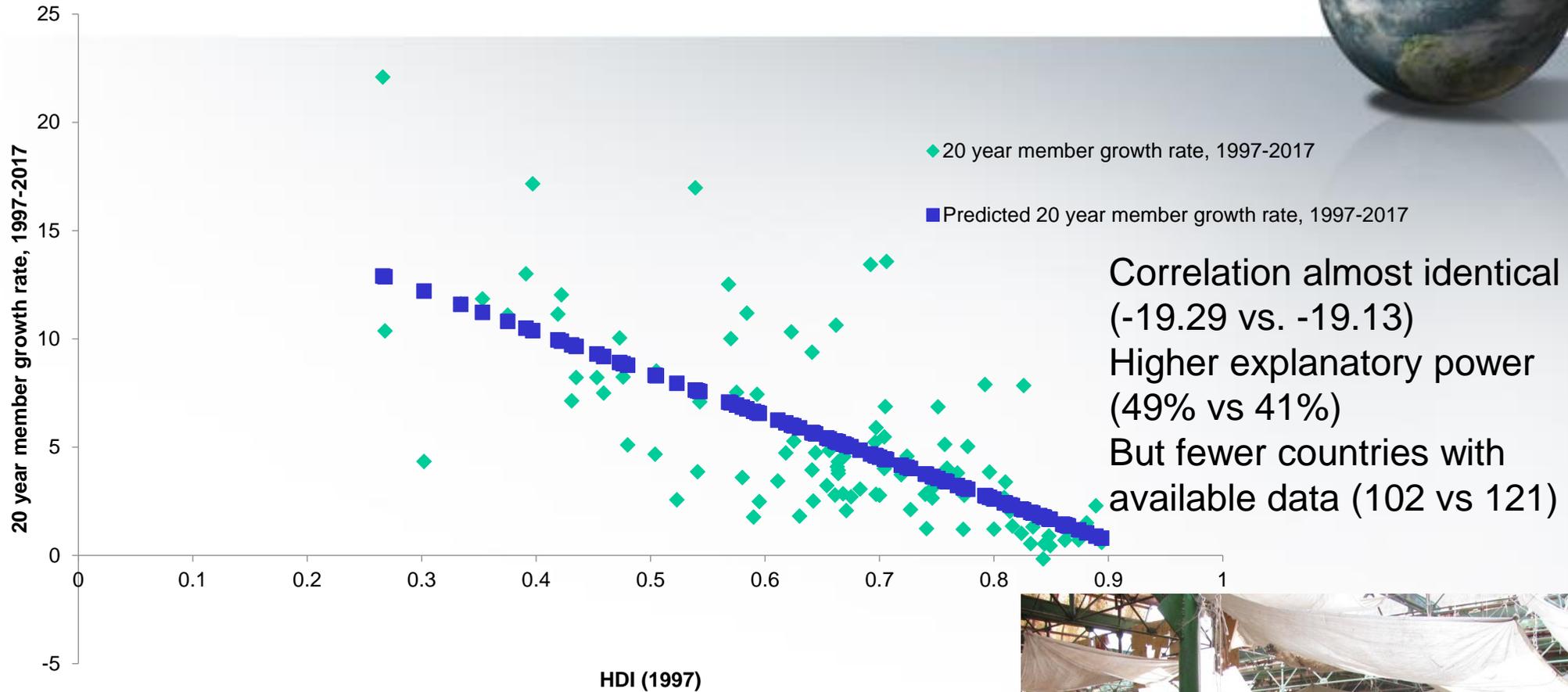


Indicator	Result	Explanation
Observations	121	Countries with data
Multiple R	0.645	Correlation coefficient (strength of relationship)
R Squared	0.417	41% of church growth variability explained by HDI
p-value	1.24×10^{-15}	Highly statistically significant, unlikely to be random
X coefficient	-19.13	An increase in HDI of 0.1 is expected to correlate with a 1.9% decrease in annual church growth rates.
Lower and upper 95% confidence interval	-15.03 to -23.23	The true magnitude of correlation between HDI and annual church growth rate is expected to fall in this range



Shanghai, China

Human Development Index (1997)



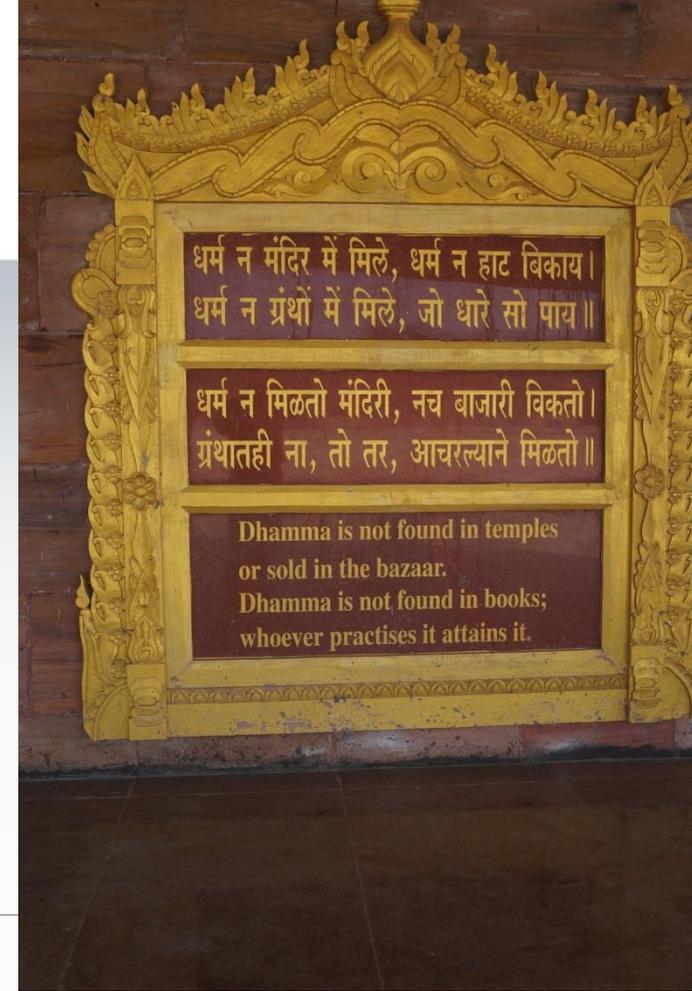
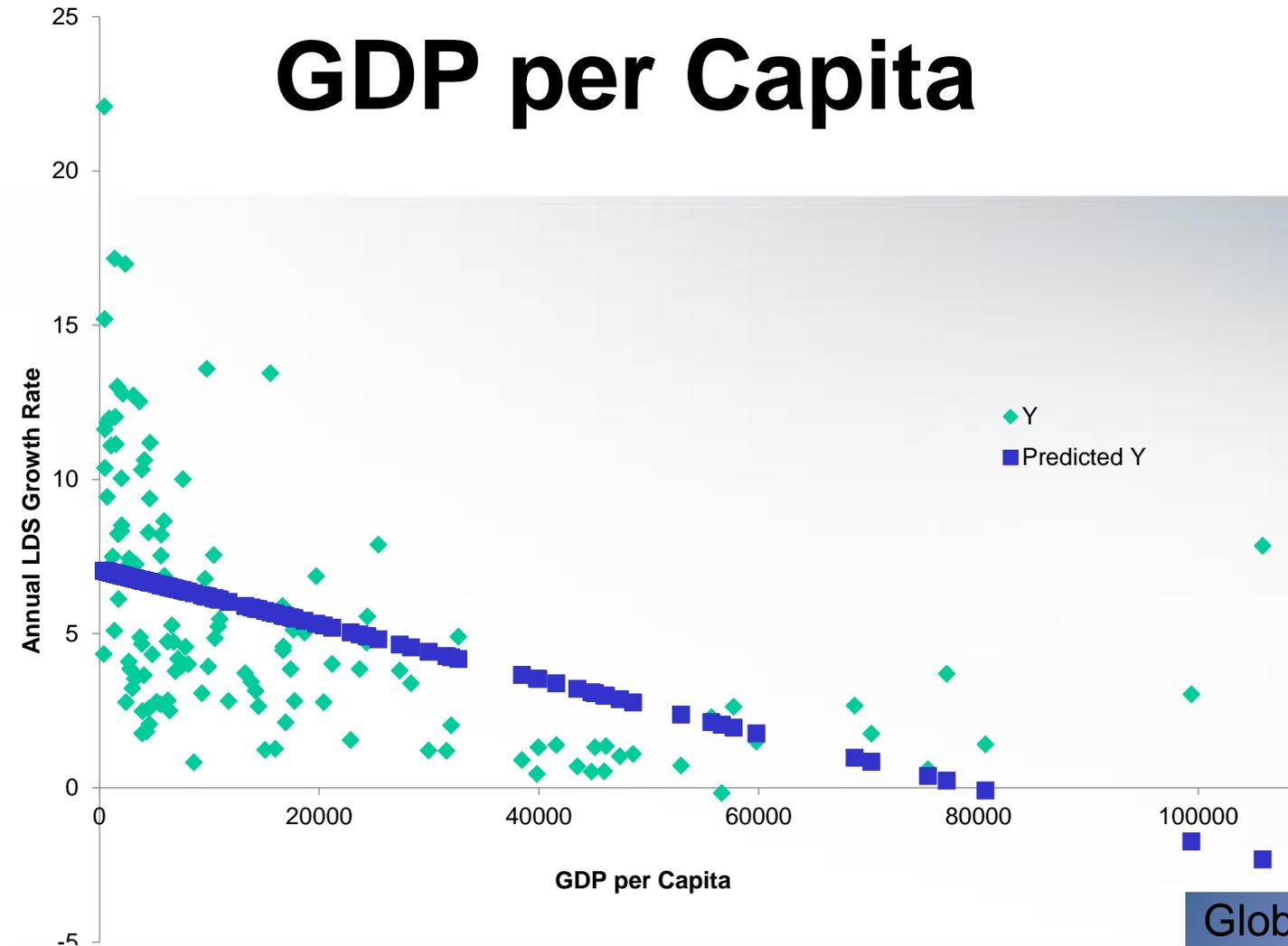
Correlation almost identical (-19.29 vs. -19.13)
 Higher explanatory power (49% vs 41%)
 But fewer countries with available data (102 vs 121)

Indicator	Result	Explanation
Observations	102	Countries with data
Multiple R	0.702	Correlation coefficient (strength of relationship)
R Squared	0.493	49% of church growth variability explained by HDI
p-value	1.85×10^{-16}	Highly statistically significant, unlikely to be random
X coefficient	-19.29	An increase in HDI of 0.1 is expected to correlate with a 1.9% decrease in annual church growth rates.
Lower and upper 95% confidence interval	-15.41 to -23.16	The true magnitude of correlation between HDI and annual church growth rate is expected to fall in this range



Market, Ferghana Valley, Uzbekistan

GDP per Capita

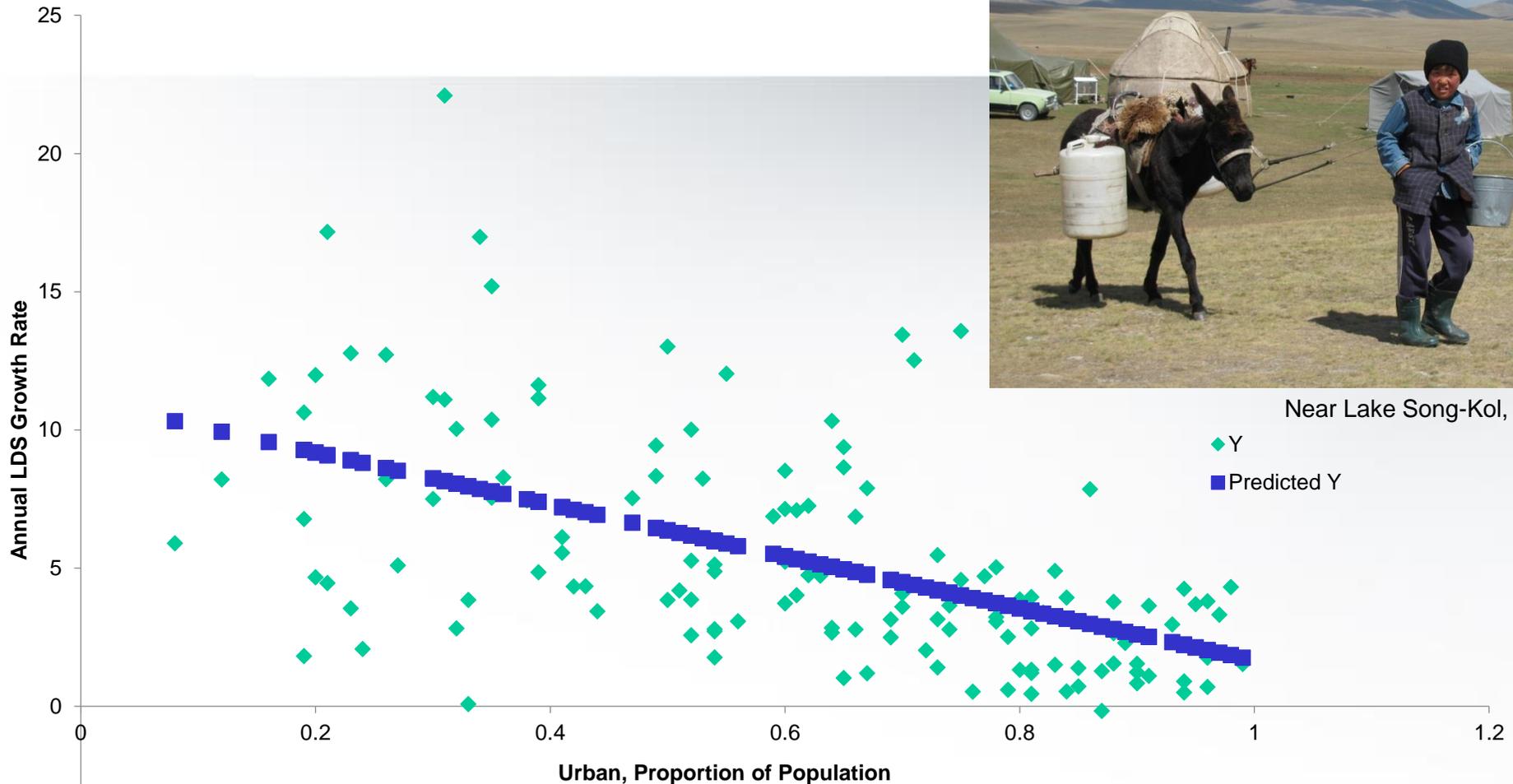


Global Vipassana Pagoda
Mumbai, India



Indicator	Result	Explanation
Observations	128	Countries with data
Multiple R	0.467	Correlation coefficient (strength of relationship)
R Squared	0.218	Fraction of church growth variability explained
p-value	2.63×10^{-8}	Highly statistically significant, unlikely to be random
X coefficient	-8.9×10^{-5}	An increased in GDPPC by \$10,000 is expected to correlate with a reduction of 0.89% in annual church growth rates
Lower and upper 95% confidence interval	-0.00012- -0.000059	The true magnitude of correlation between GDPPC and annual church growth rate is expected to fall in this range

Urbanization

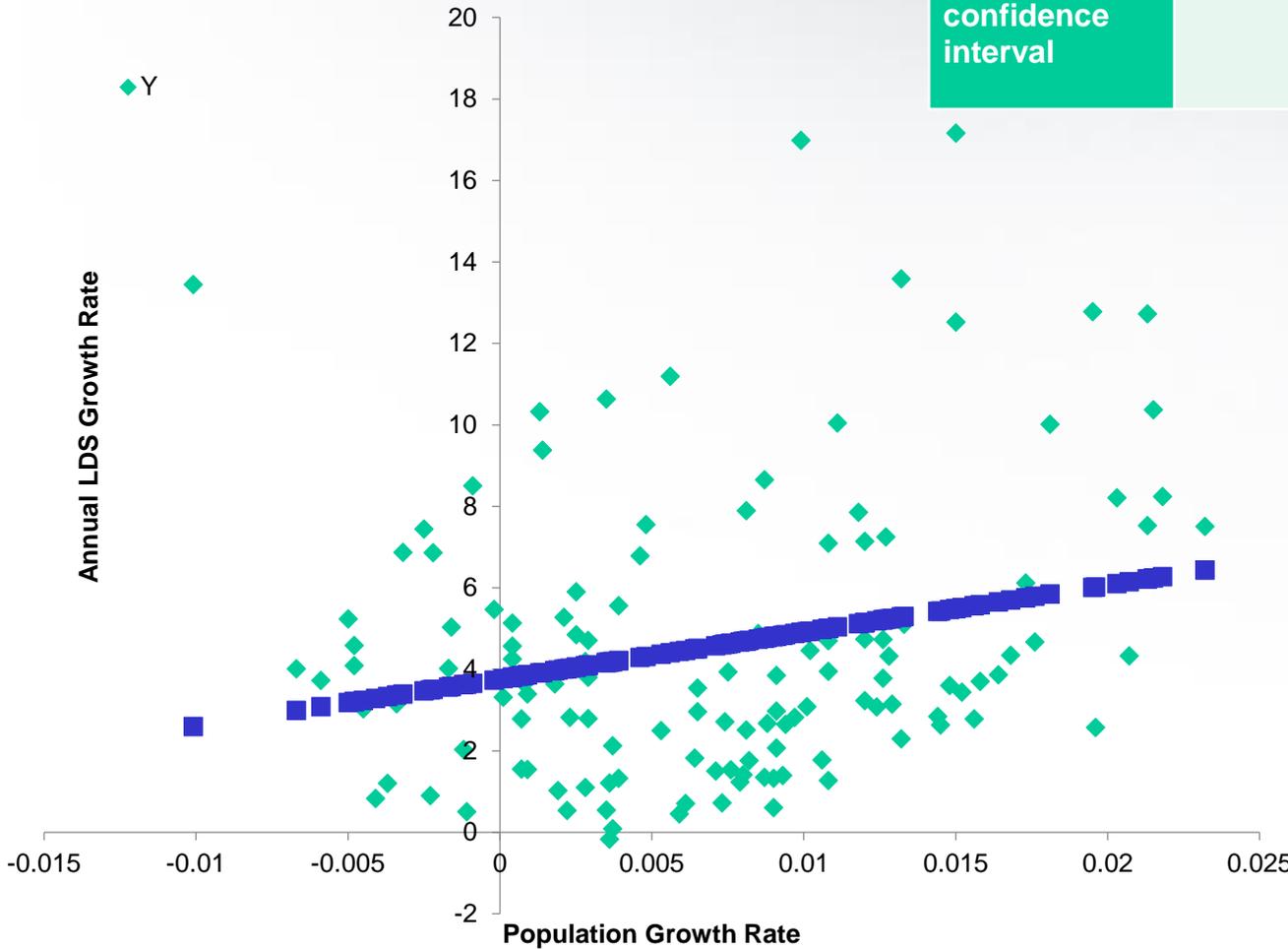


Near Lake Song-Kol, Kyrgyzstan

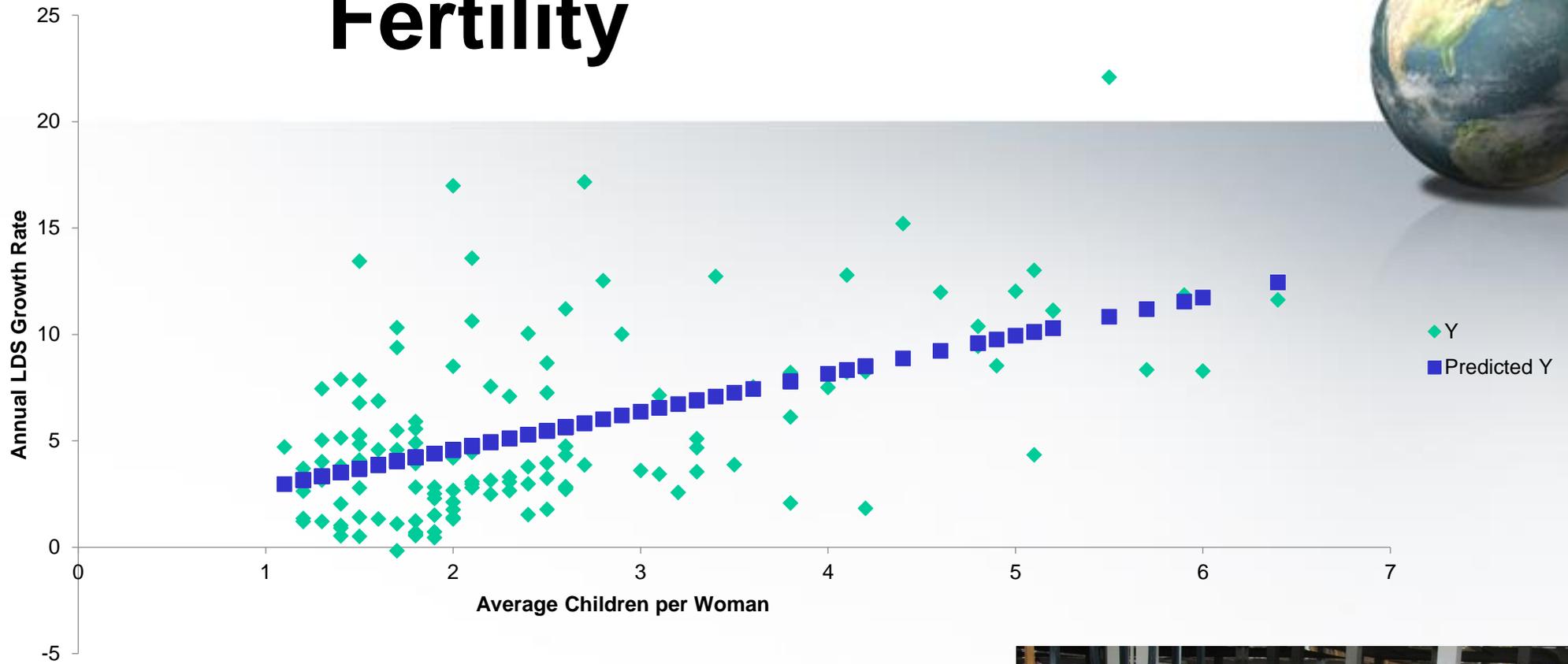
Indicator	Result	Explanation
Observations	137	Countries with data
Multiple R	0.545	Correlation coefficient (strength of relationship)
R Squared	0.297	29.7% of church growth variability explained
p-value	5.69×10^{-12}	Very high statistical significance, unlikely to be random
X coefficient	-9.4	An increase of 10% in urbanization is expected to correlate with a 0.94% decline in annual church growth rates
Lower and upper 95% confidence interval	-6.94- -11.86	The true magnitude of correlation between urbanization and annual church growth rate is expected to fall in this range

Population Growth Rate

Indicator	Result	Explanation
Observations	128	Countries with data
Multiple R	0.239	Correlation coefficient (strength of relationship)
R Squared	0.057	Fraction of church growth variability explained
p-value	0.0065	Statistically significant, unlikely to be random
X coefficient	1.15	An increase in population growth rate of 1% (.01) is expected to correlate with a 1.15% percentage change in annual church growth rate
Lower and upper 95% confidence interval	32.8-197.8	The true magnitude of correlation between population growth and annual church growth rate is expected to fall in this range. This range is very wide, leaving much uncertainty about the magnitude of relationship.



Fertility



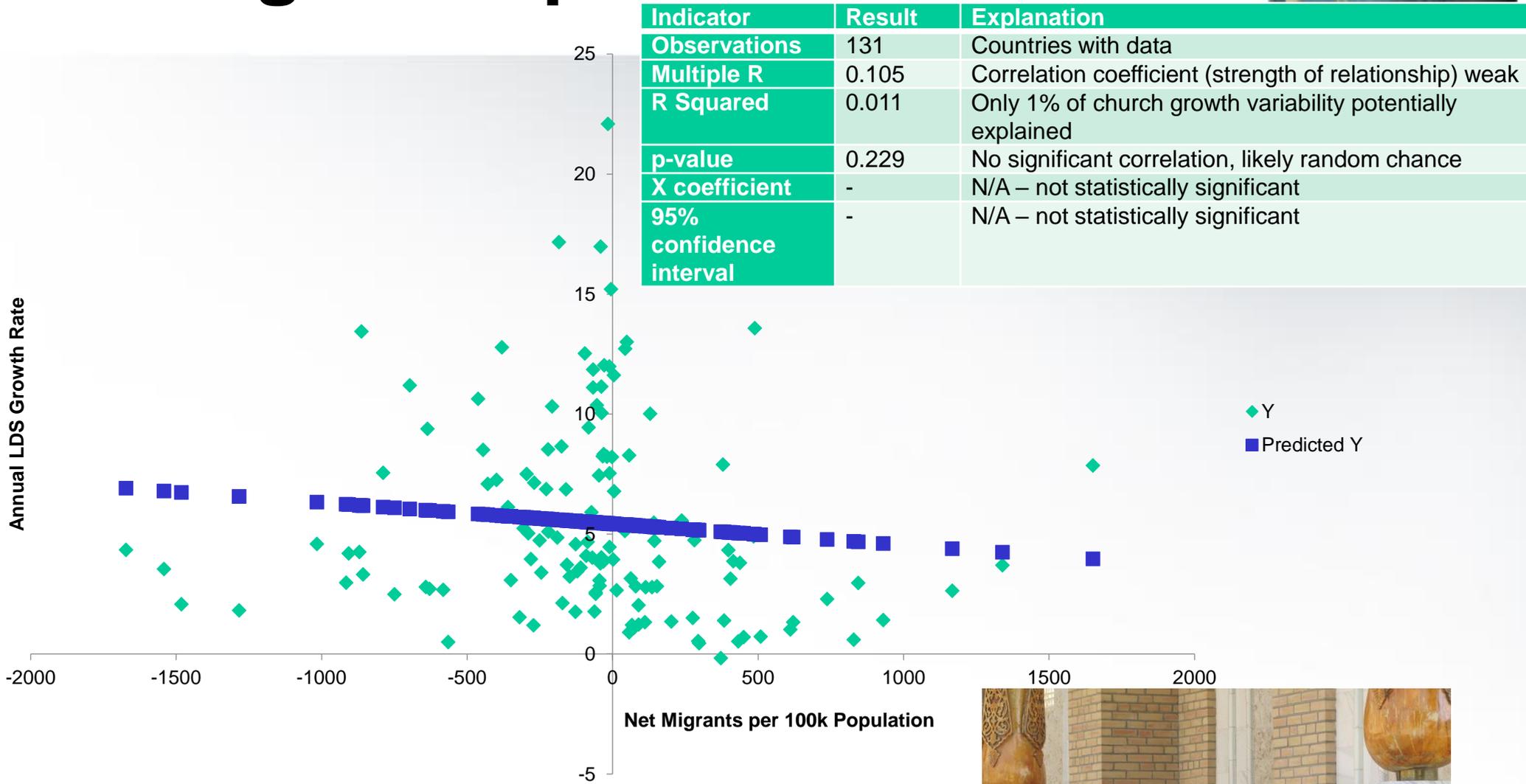
◆ Y
■ Predicted Y

Indicator	Result	Explanation
Observations	131	Countries with data
Multiple R	0.533	Correlation coefficient (strength of relationship)
R Squared	0.285	28.5% of church growth variability correlates to fertility
p-value	5.12×10^{-11}	Statistical significance, or chance correlation is random
X coefficient	1.78	A change in fertility rates of 1 more child per woman is expected to correlate with a 1.78% increase in annual church growth rates
Lower and upper 95% confidence interval	1.29-2.27	The true magnitude of correlation between fertility and annual church growth rate is expected to fall between 1.29 and 2.27



Uzbekistan

Net Migration per 100k

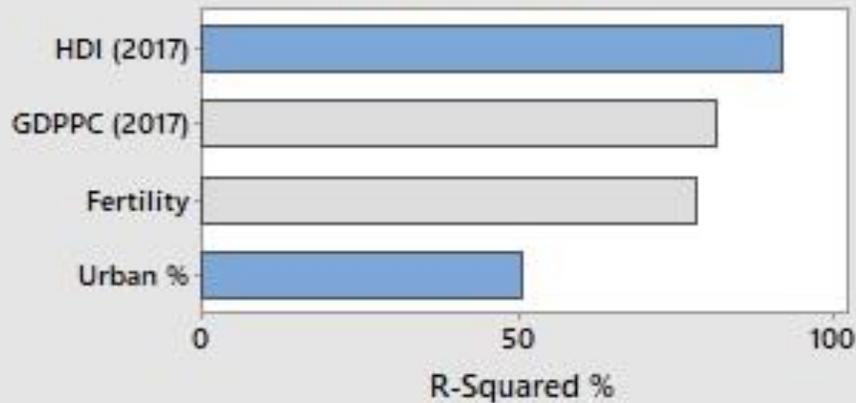


Near Mausoleum of Imam Al-Bukhari, Samarkand, Uzbekistan



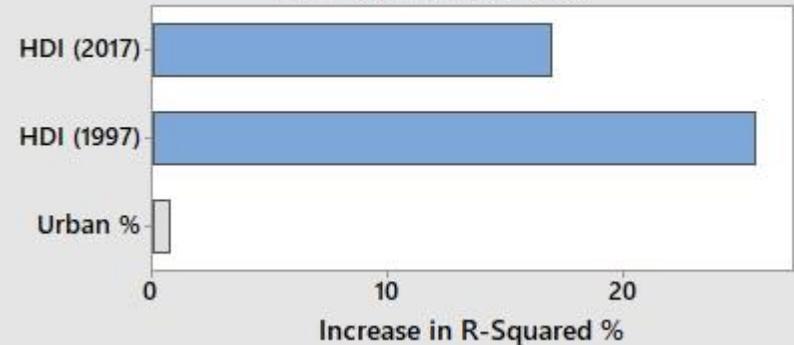
Each X Regressed on All Other Terms

Gray bars represent Xs that do not help explain additional variation in Y.



Incremental Impact of X Variables

Long bars represent Xs that contribute the most new information to the model.



- Initial (1997) HDI more predictive than final (2017) HDI
- GDP per capita, Fertility, Population Growth Rates, and Urbanization, although correlated, are NOT independent predictors of LDS growth when adjusted for HDI
- Migration not correlated

“Building from Centers of Strength”



- Official LDS outreach paradigm since early 1990s
- Restricts outreach into new areas
- Focuses on strengthening old congregations
- Asserts that church growth comes from having a “critical mass” of members able to implement a full church program

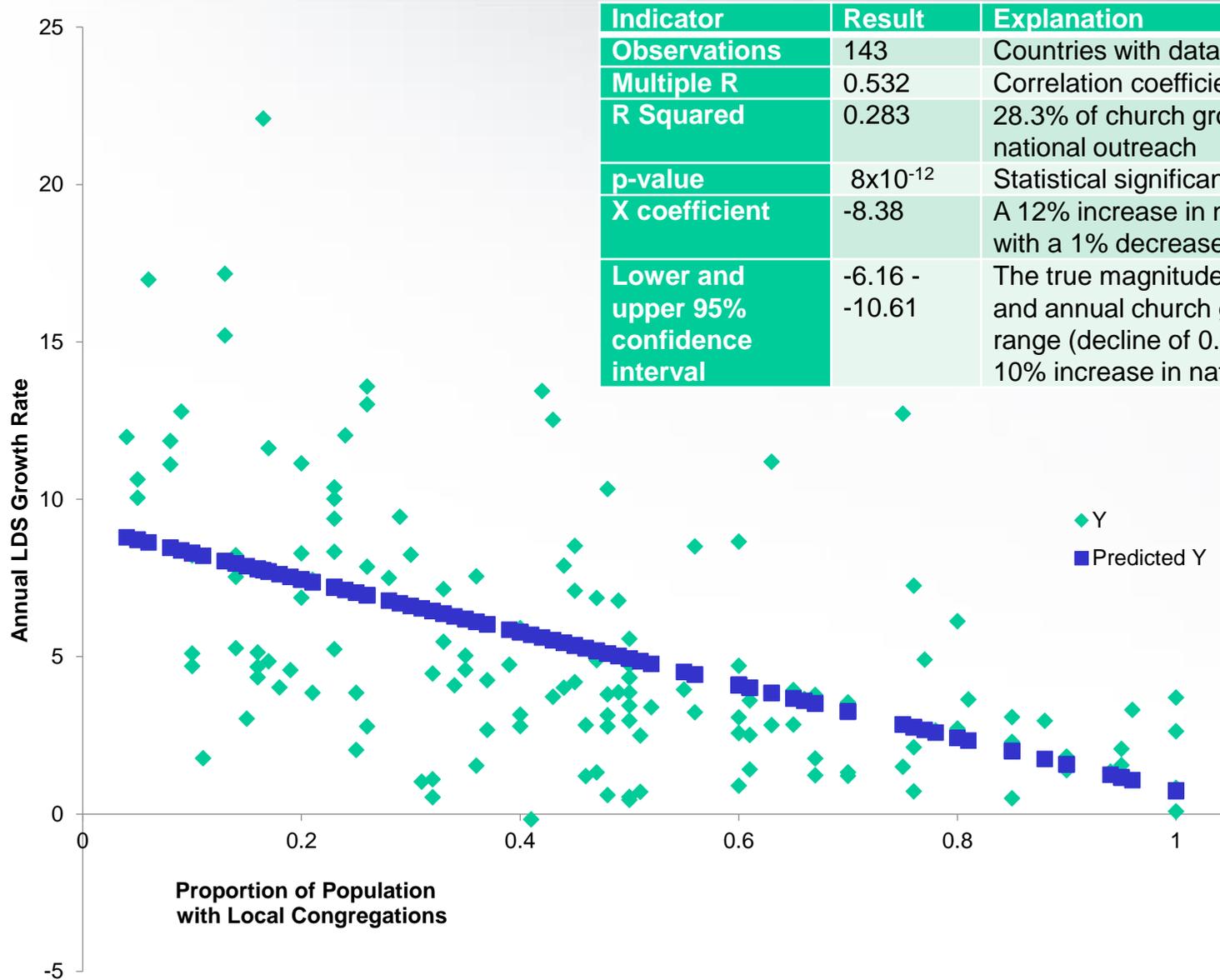


Missiological Literature



- Long-standing missiological literature reports to the contrary.
- New congregations typically grow faster than old ones
- Establishing new congregations is a key to growth
- Little impact of congregation size on growth: small effect, potentially inverse
- Different stages of congregational life-cycle: growth mode vs. maintenance mode
- Questions of the putative mechanisms behind “centers of strength” philosophy
- Does implementing “Mormon Cultural Area” program in large international wards benefit church growth, and if so, how?
- Concern that plethora of programming in large congregations may distract rather than contribute to community outreach.
- “The Gospel vs. The Church” – What is essential?

National Outreach

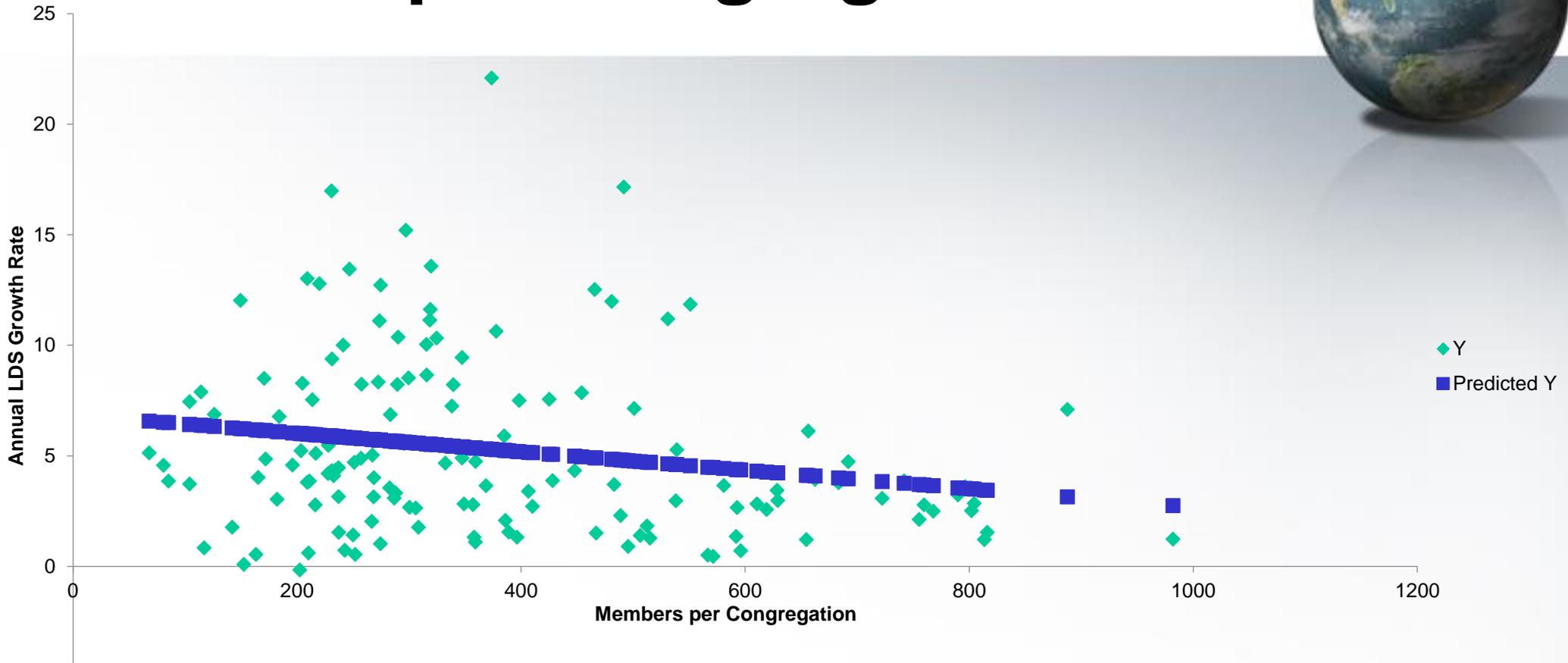


New areas demonstrate higher average growth rates than saturated ones.



LDS meetinghouse, Kyiv, Ukraine

Members per Congregation



Indicator	Result	Explanation
Observations	143	Countries with data
Multiple R	0.206	Correlation coefficient (strength of relationship)
R Squared	0.042	Only 4% of church growth variability explained by members per congregation
p-value	0.0016	Statistically significant, correlation unlikely to be random
X coefficient	-0.00418	An increase of 240 members per congregation is expected to correlate with a 1% decrease in annual church growth (-0.00418% per additional member)
Lower and upper 95% confidence interval	-0.00088 - -0.0074	Wide confidence interval range; effect is small (true range could be 1% decrease in church growth per 135 to 1,136 additional members)

Countries with larger congregations experience slower average member growth

Convert Retention and Member Activity



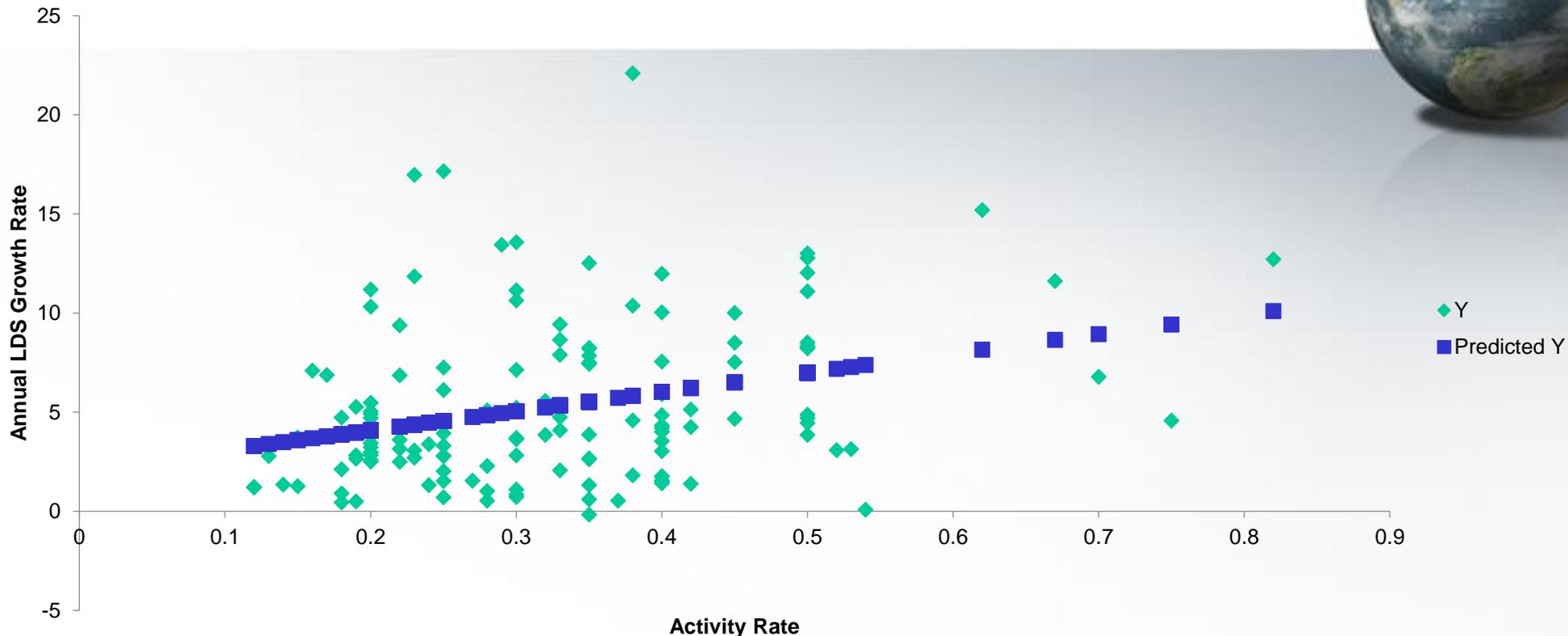
- “Is it better to baptize a hundred and retain fifty or to baptize six hundred and retain a hundred?”
Henry Moyle
- Foundation of LDS “quick-baptize” paradigms, “doorstep discussions,” etc.
- Is baptism without conversion a “costless” exercise for the convert and the congregation?
- Ethical concerns of exploitation and “I-It vs. I-Thou” relationships (Quinn)
- What does the data show about the relationship between member activity/convert retention and growth rates?

The Cost of Inactivity



- “Drag” phenomenon – negative impact of inactivity on congregational and member growth
- More than simply a “free-rider” effect of individuals being subsidized in religious observance
- Unfavorable ratios of actives to inactives lead to dissipation of resources and extinguish enthusiasm for community outreach
- “Trying to corral goats instead of feeding sheep.”
- Hypothesis: The “drag” on long-term growth generated by low-retaining missionary paradigms outweighs any short-term benefits
- Countries with higher member activity will experience higher average long-term growth rates than those with low activity rates

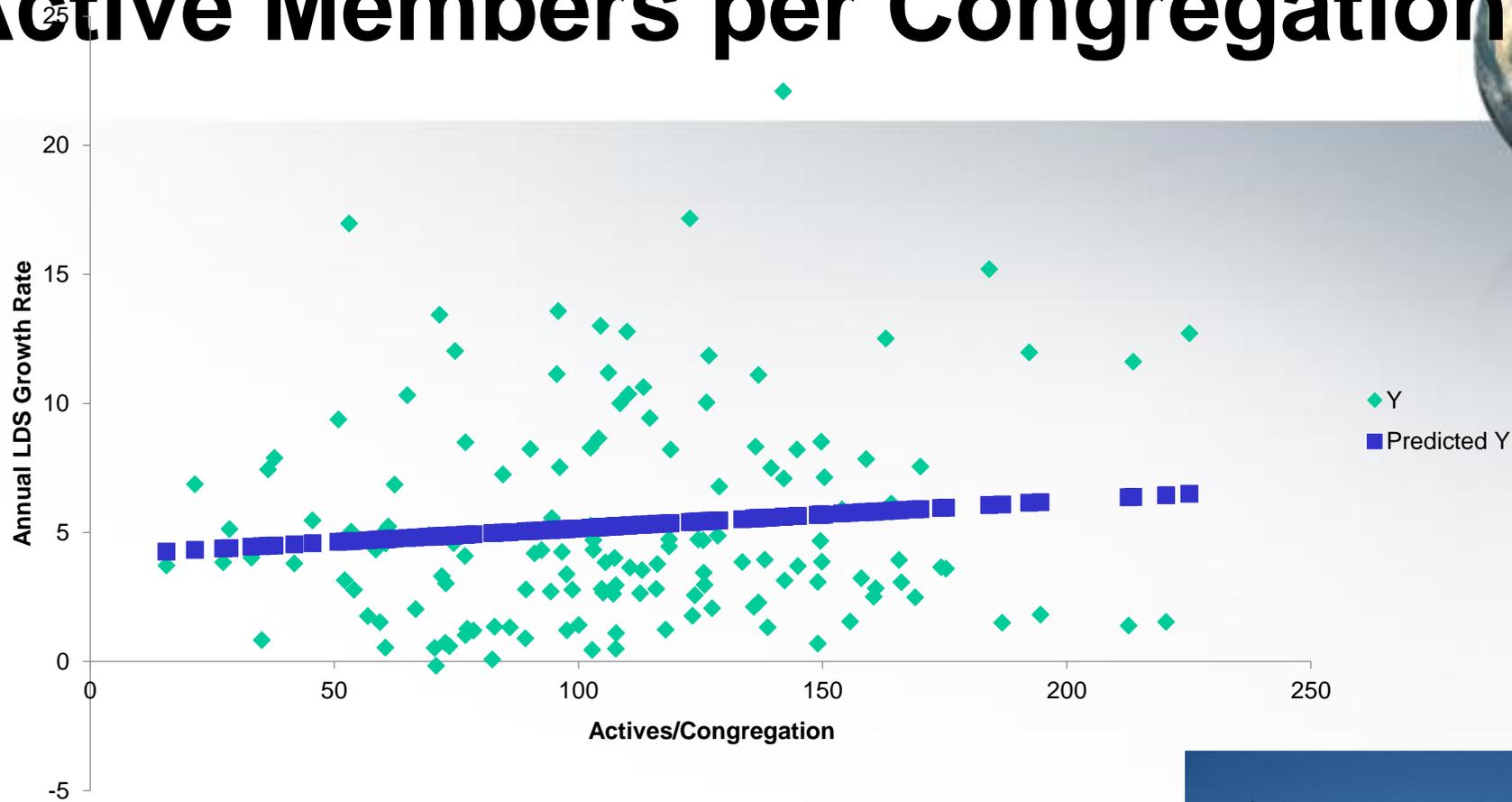
Member Activity



LDS Chapel, Dublin, Ireland

Indicator	Result	Explanation
Observations	143	Countries with data
Multiple R	0.313	Correlation coefficient (strength of relationship)
R Squared	0.098	9.8% of church growth variability explained by member activity rate
p-value	0.000137	Statistically significant correlation, unlikely to be random
X coefficient	9.72	An increase of approximately 10% in member activity rates is expected to correlate with an increase of 1% in annual church growth rates
Lower and upper 95% confidence interval	4.82-14.62	The true magnitude of correlation between member activity and annual church growth rate is expected to fall in this range

Active Members per Congregation



Indicator	Result	Explanation
Observations	143	Countries with data
Multiple R	0.114	Correlation coefficient (strength of relationship) is very weak
R Squared	0.013	Only 1% of church growth variability potentially explained
p-value	0.17	No significant correlation, likely random chance
X coefficient	-	N/A – not statistically significant
Lower and upper 95% confidence interval	-	N/A – not statistically significant



Ukraine Kiev Temple

Correlating Supply-Side Factors

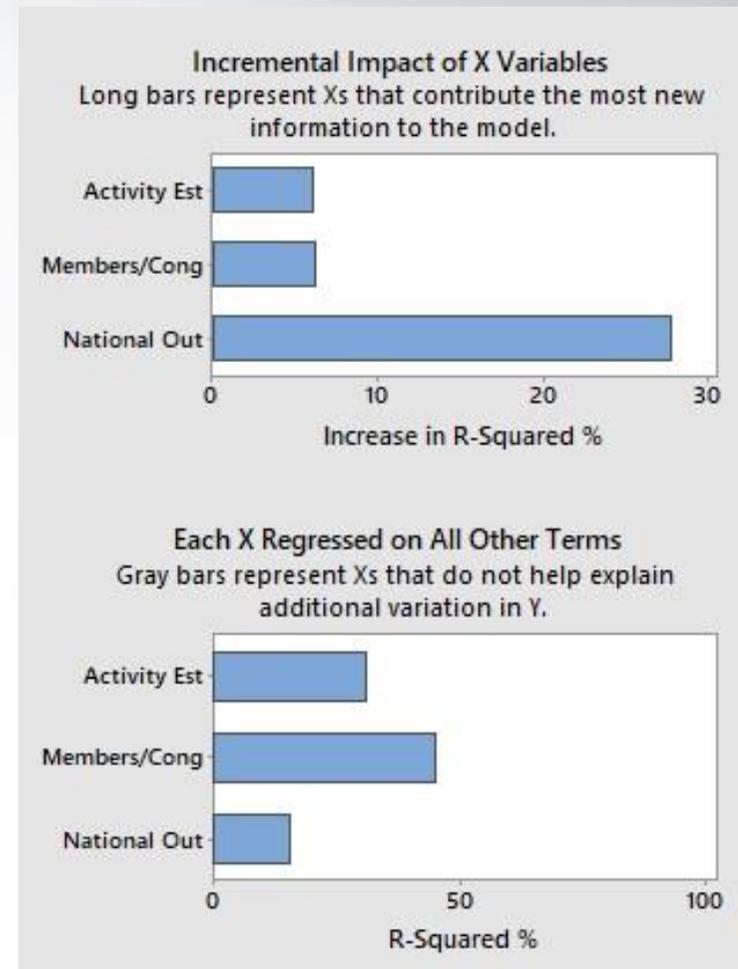


- National Outreach percentage (-)
- Members per congregation (-)
- Member Activity Rates (+)
- Modest but significant independent effects on membership growth rates

+ = Positive Correlation
- = Negative Correlation



Li River near Guilin, China

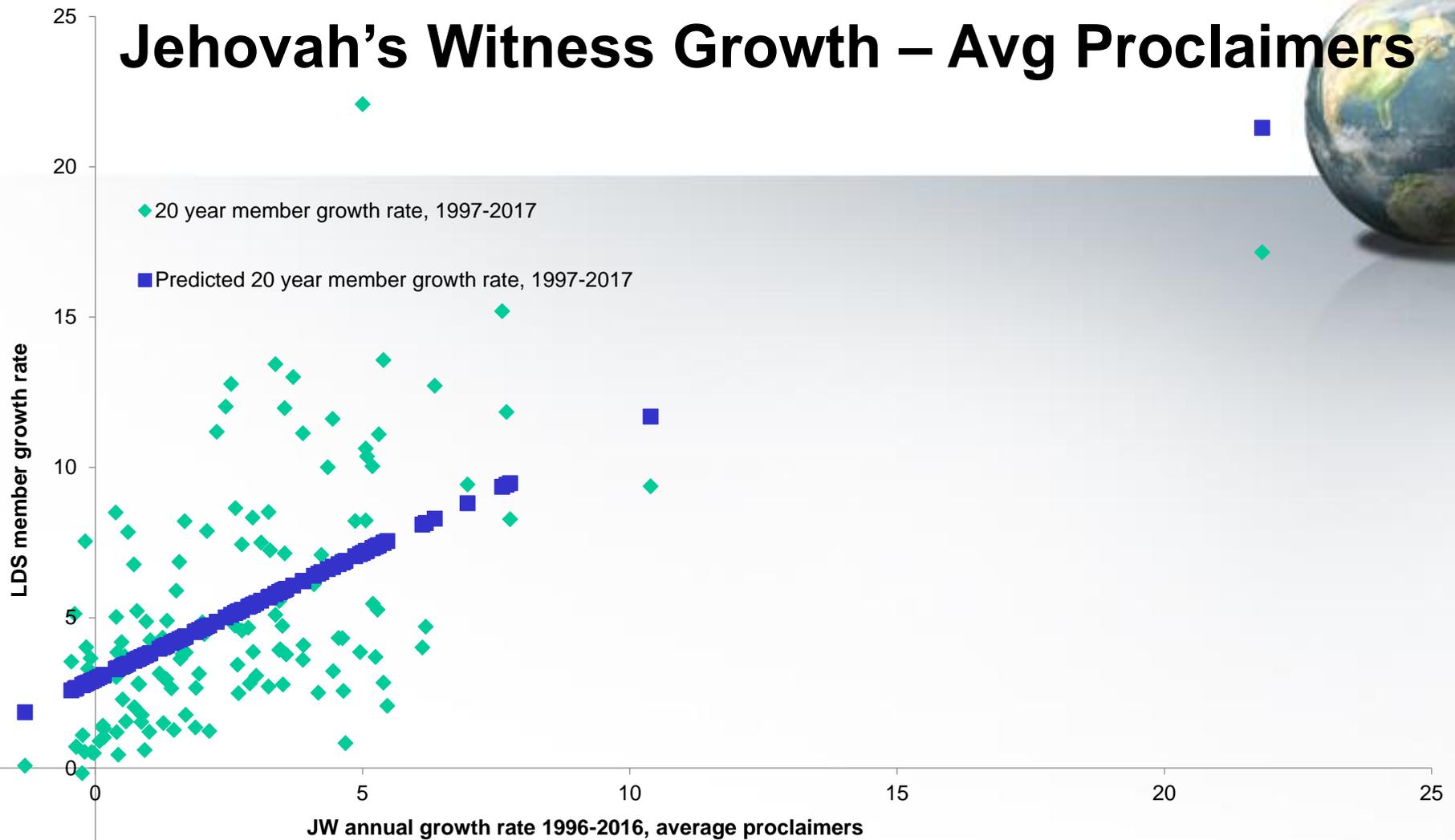




Tulip Gardens, Kukenhof, Netherlands

- Activity Rates (+) and Members per Congregation (-) both independently correlate with member growth rates
- Nations with larger congregations tend to experience slower growth
- Nations with higher activity rates tend to experience more rapid growth
- Magnitude of effect is small

Jehovah's Witness Growth – Avg Proclaimers

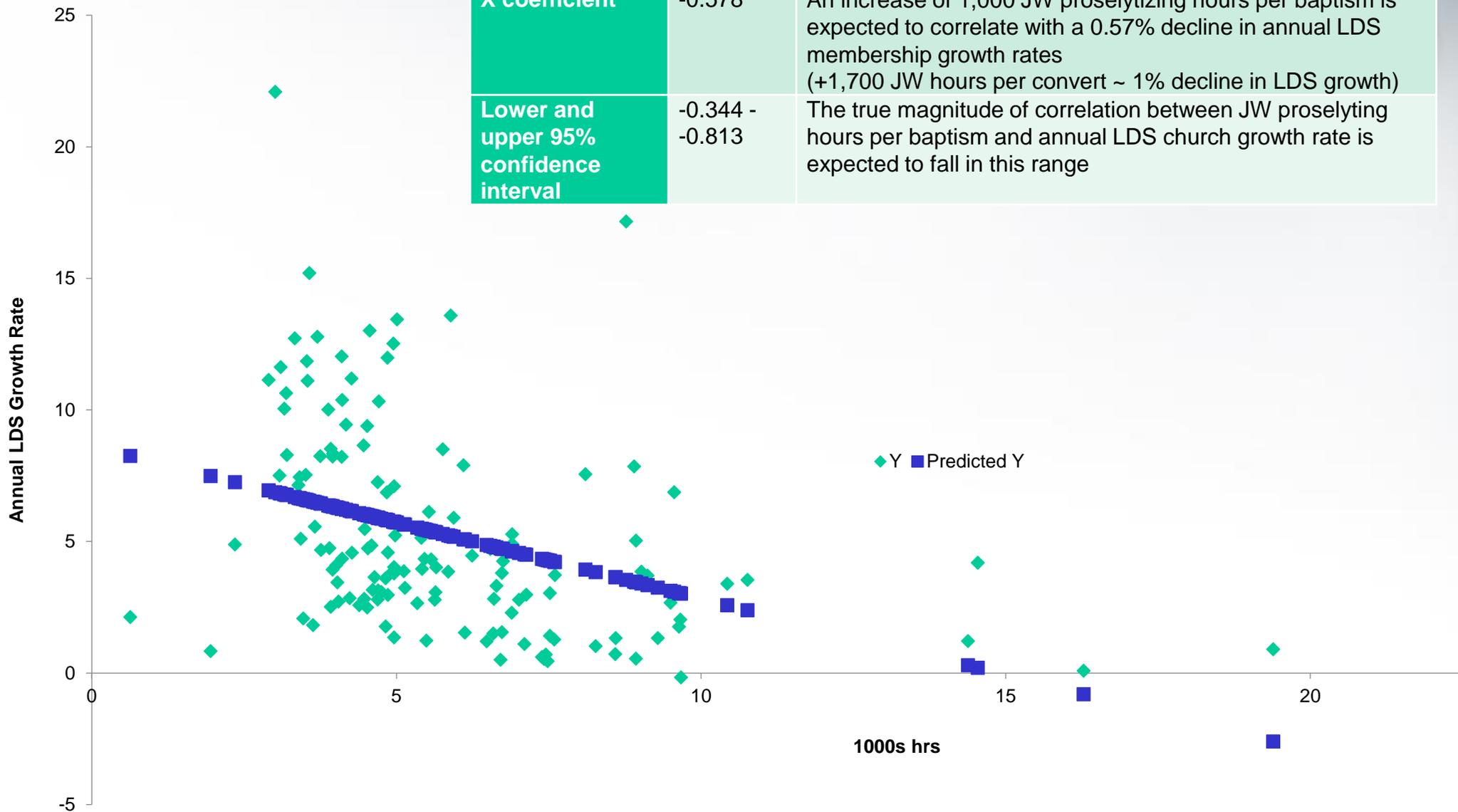


Indicator	Result	Explanation
Observations	134	Countries with data
Multiple R	0.584	Correlation coefficient (strength of relationship)
R Squared	0.341	34% of church growth variability explained
p-value	1.28×10^{-13}	Statistical significance, or chance correlation is random
X coefficient	0.84	A change in Jehovah's Witness growth rates of 1% is expected to correlates with a 0.84% increase in annual LDS growth rates.
Lower and upper 95% confidence interval	0.639-1.04	The true magnitude of correlation between JW and LDS growth rates is expected to fall in this range

JW Preaching Hours per Baptism, 1000s

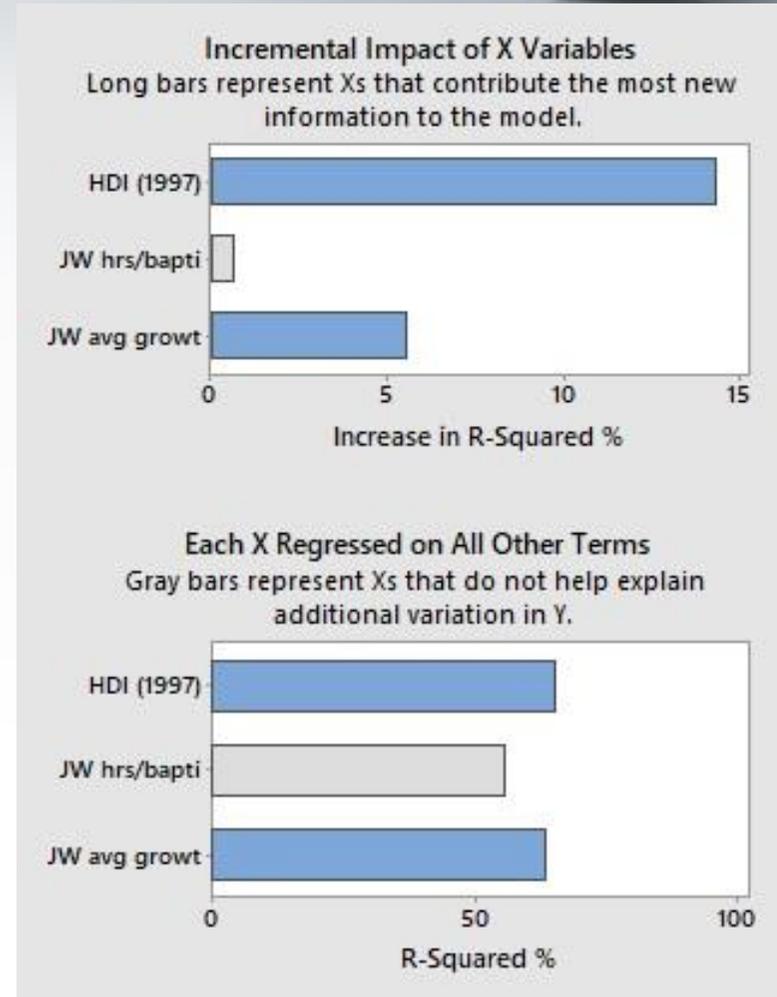


Indicator	Result	Explanation
Observations	136	Countries with data
Multiple R	0.388	Correlation coefficient (strength of relationship)
R Squared	0.150	Fraction of church growth variability explained
p-value	7×10^{-6}	Statistical significance, or chance correlation is random
X coefficient	-0.578	An increase of 1,000 JW proselytizing hours per baptism is expected to correlate with a 0.57% decline in annual LDS membership growth rates (+1,700 JW hours per convert ~ 1% decline in LDS growth)
Lower and upper 95% confidence interval	-0.344 - -0.813	The true magnitude of correlation between JW proselytizing hours per baptism and annual LDS church growth rate is expected to fall in this range

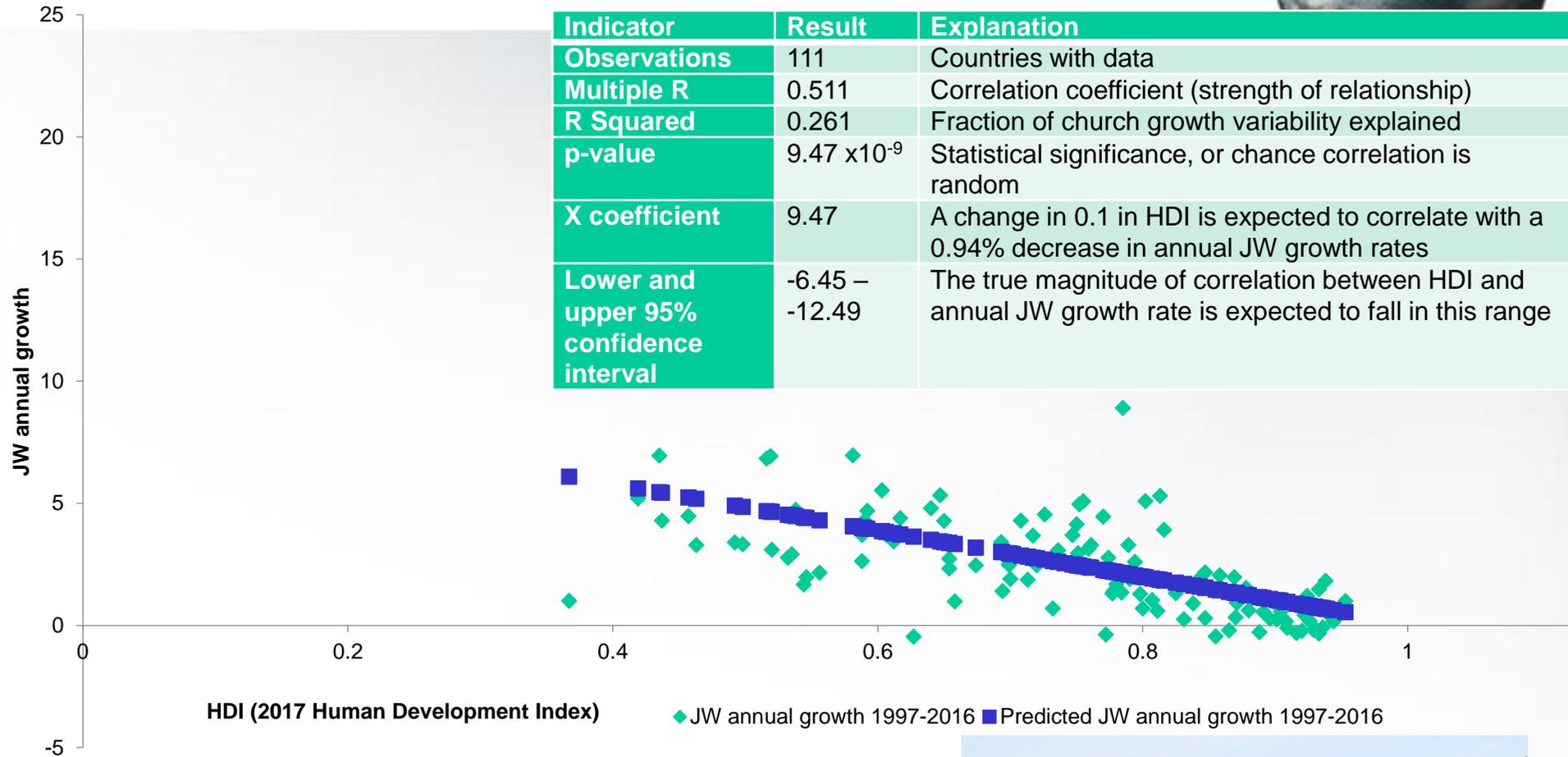




- JW preaching hours (1000s) per baptism was *not* independent predictor of LDS growth rates when controlling for HDI and JW growth
- JW growth was independent predictor of LDS growth rates in study period when controlling for HDI

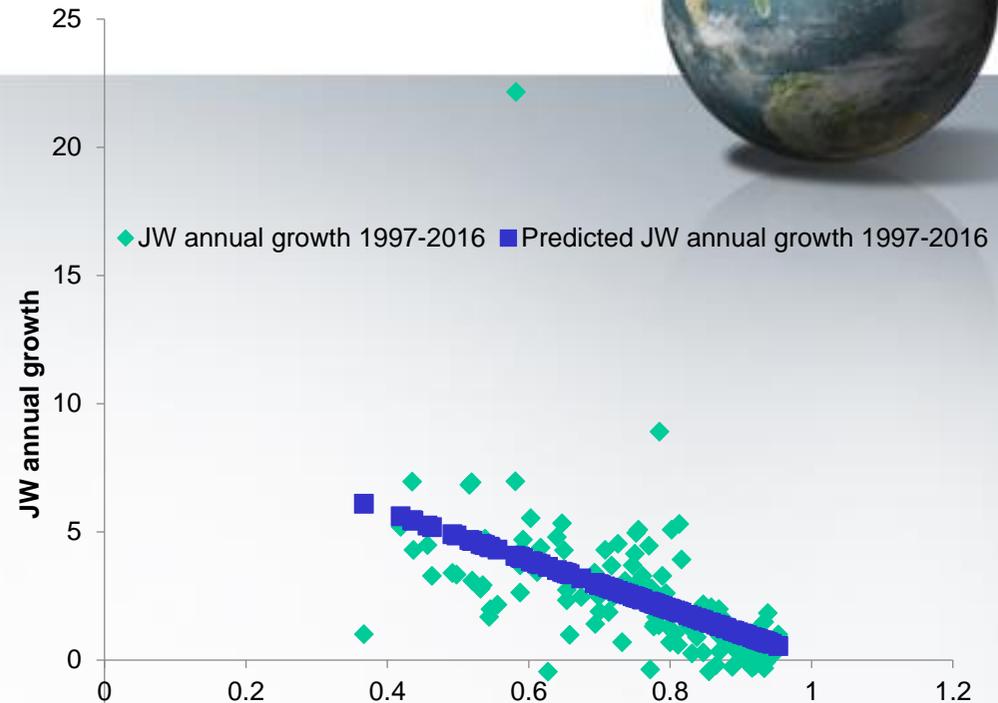
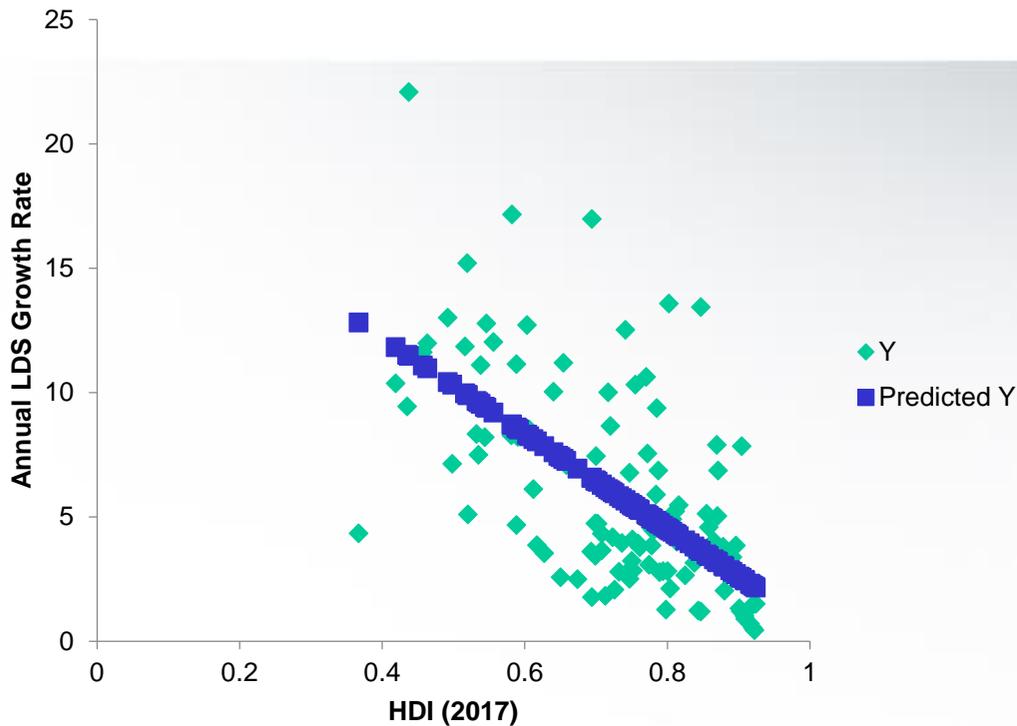


HDI (2017) vs JW Growth Rates



Embara Village, Panama

LDS and JW growth vs HDI

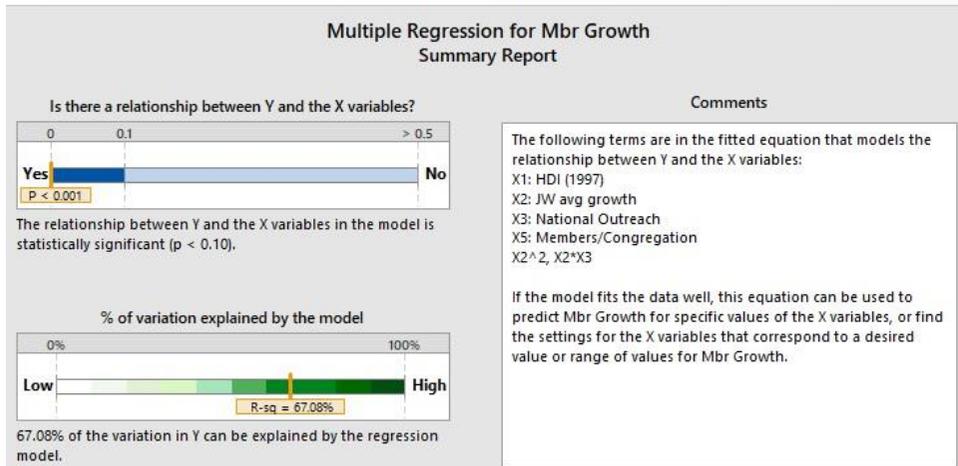
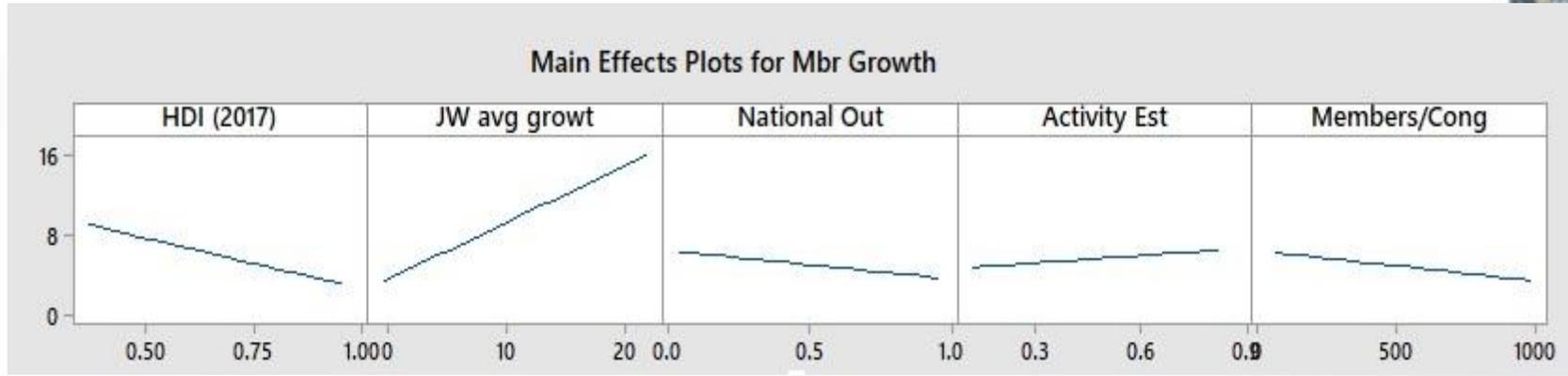


Indicator	Result	Explanation
Observations	121	Countries with data
Multiple R	0.645	Correlation coefficient (strength of relationship)
R Squared	0.417	41% of church growth variability explained by HDI
p-value	1.24×10^{-15}	Highly statistically significant, unlikely to be random
X coefficient	-19.13	An increase in HDI of 0.1 is expected to correlate with a 1.9% decrease in annual church growth rates.
Confidence Interval	-15.03 to -23.23	The true magnitude of correlation between HDI and annual church growth rate is expected to fall in this range

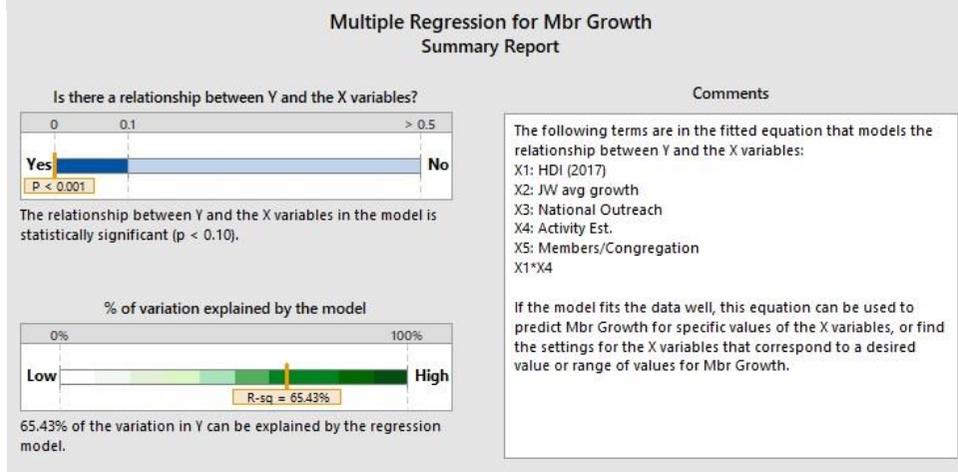
Indicator	Result	Explanation
Observations	111	Countries with data
Multiple R	0.511	Correlation coefficient (strength of relationship)
R Squared	0.261	Fraction of church growth variability explained
p-value	9.47×10^{-9}	Statistical significance, or chance correlation is random
X coefficient	9.47	A change in 0.1 in HDI is expected to correlate with a 0.94% decrease in annual JW growth rates
Lower and upper 95% confidence interval	-6.45 – -12.49	The true magnitude of correlation between HDI and annual JW growth rate is expected to fall in this range

Lower explanatory power of HDI:
 1997 HDI – 32% (JW) vs 49% (LDS)
 2017 HDI - 26% (JW) vs 41% (LDS)

Independently Correlating Factors



Human Development Index (HDI) (1997 & 2017) (-)
 JW annual Growth Rate (+)
 National Outreach Percentage (-)
 Activity Rate (-)
 Members per Congregation (-)



These five factors together explain 65-67% (approximately 2/3) of LDS membership growth over the period studied (1997-2017)

Member Growth



Multiple Regression for Mbr Growth
Model Building Report

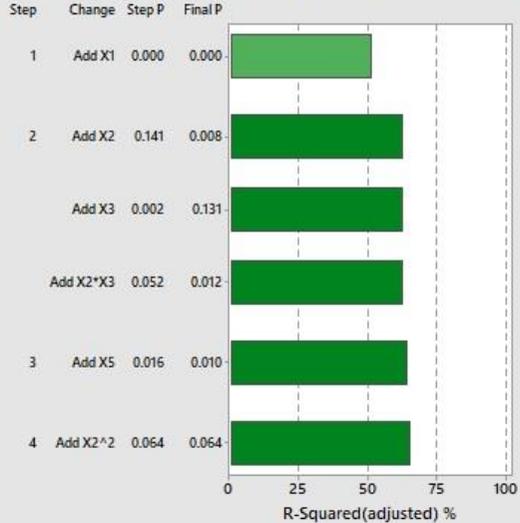
X1: HDI (1997) X2: JW avg growt X3: National Out X4: Activity Est X5: Members/Cong

Final Model Equation

$$\text{Mbr Growth} = 12.05 - 11.60 X1 + 1.265 X2 + 1.78 X3 - 0.00393 X5 - 0.0255 X2^2 - 1.571 X2^*X3$$

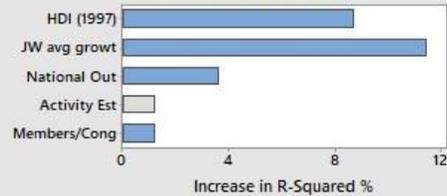
Model Building Sequence

Displays the order in which terms were added or removed.



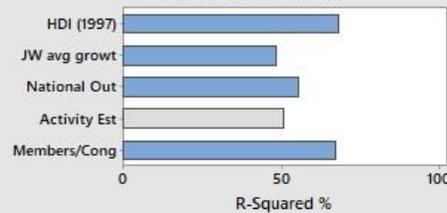
Incremental Impact of X Variables

Long bars represent Xs that contribute the most new information to the model.



Each X Regressed on All Other Terms

Gray bars represent Xs that do not help explain additional variation in Y.



Multiple Regression for Mbr Growth
Model Building Report

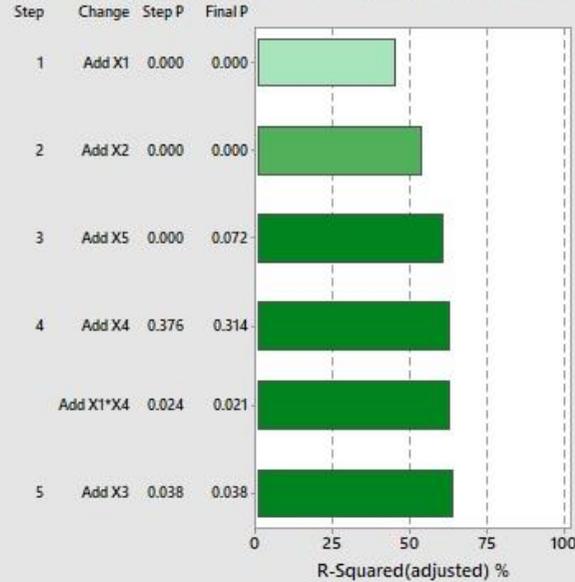
X1: HDI (2017) X2: JW avg growt X3: National Out X4: Activity Est X5: Members/Cong

Final Model Equation

$$\text{Mbr Growth} = 4.92 + 0.52 X1 + 0.5511 X2 - 2.81 X3 + 27.0 X4 - 0.00299 X5 - 33.1 X1^*X4$$

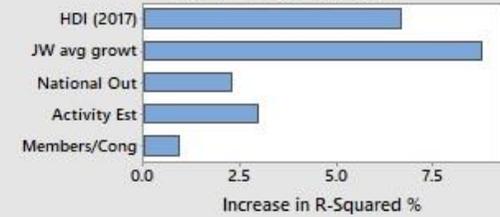
Model Building Sequence

Displays the order in which terms were added or removed.



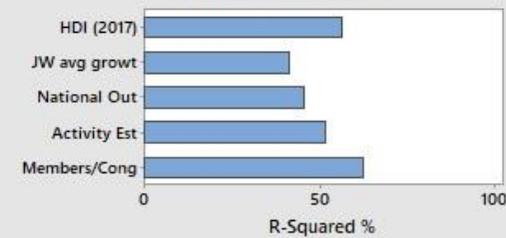
Incremental Impact of X Variables

Long bars represent Xs that contribute the most new information to the model.



Each X Regressed on All Other Terms

Gray bars represent Xs that do not help explain additional variation in Y.



Multiple Regression for Congregation Model Building Report

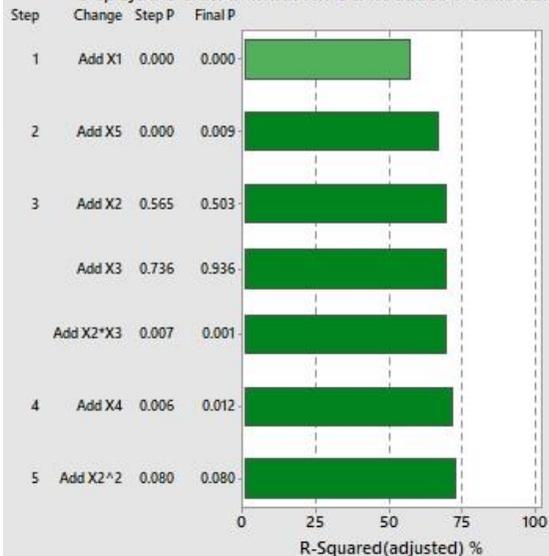
X1: HDI (1997) X2: JW avg growt X3: National Out X4: Activity Est X5: Members/Cong

Final Model Equation

$$\text{Congregatio} = 10.56 - 16.96 X1 + 0.986 X2 + 5.31 X3 + 6.89 X4 - 0.00430 X5 - 0.0220 X2^2 - 1.859 X2 * X3$$

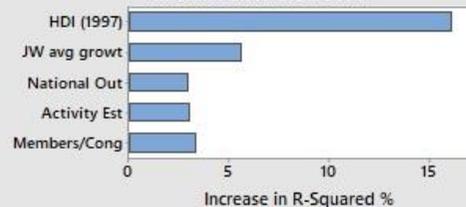
Model Building Sequence

Displays the order in which terms were added or removed.



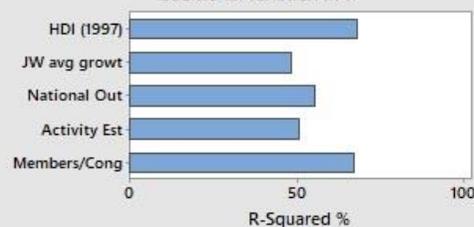
Incremental Impact of X Variables

Long bars represent Xs that contribute the most new information to the model.



Each X Regressed on All Other Terms

Gray bars represent Xs that do not help explain additional variation in Y.



Congregational Growth



Multiple Regression for Congregation
Model Building Report

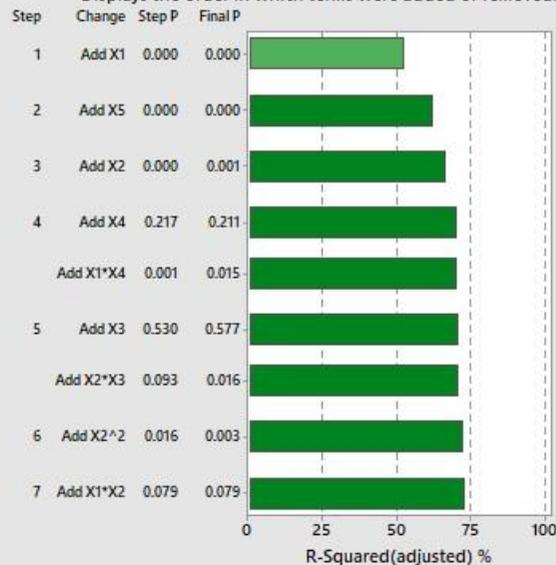
X1: HDI (2017) X2: JW avg growt X3: National Out X4: Activity Est X5: Members/Cong

Final Model Equation

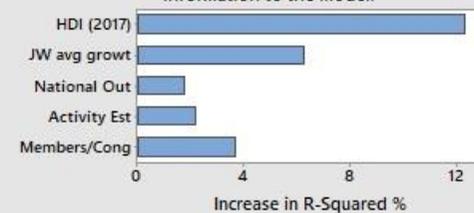
$$\text{Congregatio} = 0.45 + 0.49 X1 + 2.323 X2 + 2.75 X3 + 27.37 X4 - 0.00559 X5 - 0.0401 X2^2 - 1.495 X1 * X2 - 33.1 X1 * X4 - 1.223 X2 * X3$$

Model Building Sequence

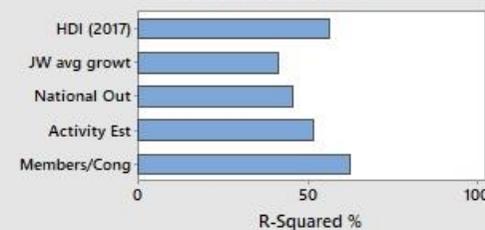
Displays the order in which terms were added or removed.



Incremental Impact of X Variables
Long bars represent Xs that contribute the most new information to the model.



Each X Regressed on All Other Terms
Gray bars represent Xs that do not help explain additional variation in Y.



Summary

+ = Positive Correlation
- = Negative Correlation



- Correlating Factors: (Relationship, Contribution)
- 1. Human Development Index (-, 47-51%)
 - Combination of income, education, and health more predictive than any single factor
- 2. Jehovah's Witness Annual Growth Rates (+, 7-10%)
 - More predictive than any LDS-specific factor
 - Captures elements of receptivity beyond those included in HDI
- 3. National Outreach Percent (-, 3-5%)
- 4. Activity Rate (+, 2%)
- 5. Members Per Congregation (-, 2%)
- In total, correlate with 65-67% of membership growth



- Unaccounted Factors
 - 33-35% in nations with church presence
 - Greater when nations with no church presence included
 - Local methods, programs, approaches?
 - Variability in leaders, missionaries?
 - Culture, Language, History?
 - Plurality/Fractionalization?
 - Persecution Index?
 - (government, militant Islam, etc.)
 - International relations?
 - Other factors?



Ashgabat, Turkmenistan

Selected References



- Alesina A et al, “Fractionalization.” *Journal of Economic Growth* 8:2 (2003), pp. 155-194.
- Cragun RT and Lawson R, “The Secular Transition: The Worldwide Growth of Mormons, Jehovah’s Witnesses, and Seventh-day Adventists.” *Sociology of Religion* 71:3 (2010), pp. 349-373.
- Fearon J, “Ethnic and Cultural Diversity by Country,” *Journal of Economic Growth* 8 (2003), pp. 195–222.
- Iannaccone, Lawrence R., “Why Strict Churches Are Strong,” *American Journal of Sociology*, 99:5 (1994), pp. 1180–1211.
- King RR and King KA, “The Effect of Mormon Organizational Boundaries on Group Cohesion,” *Dialogue* V17 No 1 (Spring 1984), pp. 61-75.
- Knowlton, David. “How Many Members Are There Really? Two Censuses and the Meaning of LDS Membership in Chile and Mexico.” *Dialogue: A Journal of Mormon Thought* 38:2 (2005), pp. 53-78.
- Phillips R, “Rethinking the International Expansion of Mormonism.” *Nova Religio* 10:1 (2006), pp. 52-68.

Thank You!

Tbilisi, Georgia



Istanbul, Turkey



Near Chopon-Ata, Kyrgyzstan



Samarkand, Uzbekistan



Kotor, Montenegro

