Regression Results for Skyscraper and Height Happiness

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1. The Model

The model posits for each country, *i*, a two-equation system. Equation (1) has building height (the tallest building in each country) as the dependent variable:

$$height_i = \alpha_1 + \beta_1 happiness_i + \boldsymbol{\gamma_1 X'_{1i}} + \varepsilon_{1i}, \qquad (1)$$

where α_1 is the constant for Equation (1), β_1 is the effect of happiness on height (as measured by the Happiness Index value), $\boldsymbol{X_{1i}}$ are a series of exogenous variables that affect height; $\boldsymbol{\gamma_1}$ is the vector of coefficients. ε_{1i} is the unobserved error term.

Similarly, for the happiness equation we have the following:

$$happiness_i = \alpha_2 + \beta_2 height_i + \boldsymbol{\gamma_2 X'_{2i}} + \varepsilon_{2i}, \qquad (2)$$

where α_2 is the constant, β_2 is the effect of height on happiness, $\boldsymbol{X_{2i}}$ are a series of exogenous variables that affect happiness; $\boldsymbol{\gamma_2}$ is the vector of coefficients. ε_{2i} is the unobserved error term for happiness.

The objective here is to estimate β_1 and β_2, respectively. Because we are dealing with a relatively small sample (which ranges from 113 to 133 countries across specifications), the goal is to estimate models that both capture the true relationship, but are also as parsimonious as possible.

1.1 Building Height

Regarding the height equation, the theory of skyscraper height suggests that building height would be a function of the demand for building space in a country, which would be determined primarily by income and population (Barr, 2016). As an additional control variable, I also include the number of skyscrapers (150 meters or taller) on the assumption that the more skyscrapers there are the taller is the tallest building. To control for regional variation, that might be due to say cultural factors, I have included regional dummy variables (see below for more information).

1.2 Happiness

A body of research has found that life-satisfaction, in general, is driven by income and those things that improve the quality of life, such as rewarding employment, economic and political stability, and positive relationships with family, friends, and fellow members of society, more broadly (Frey, 2008).

The Human Development Index (HDI), published by the United Nations Development Programme (UNDP), represents a useful measure of the quality of life and physical well-being. The HDI is comprised of three elements: (1) life expectancy, (2) per capita GDP, and (3) educational obtainment (average years of schooling).

We would posit a strong positive relationship between emotional well-belling (happiness) and physical well-being. This is the case; the correlation coefficient between the Happiness Index and the HDI is 0.84 (*n=149*); a simple regression on HDI explains 70% of the variation in the Happiness Index (see below for more regression results).

The UNDP also publishes data on income inequality around the world. Since inequality may be a (negative) determinant of well-being, two other variables were explored. First is the Coefficient of Human Inequality, which is a measure of inequality of health, education and income within countries. Another measure of inequality is the Palma Ratio, which is the ratio of national income shares of the top 10% of households to the bottom 40%.

Per capita GDP was included as well, since it was found to be a significant contributor to the Happiness Index. Lastly, similar to the height equation, regional dummy variables were included to capture regional variation in happiness due to local factors not related to the HDI or income.

The next section describes the data sources, processing, and descriptive statistics. Following that, Section 3 discusses the various statistical tests related to the data, including heteroscedasticity, endogeneity, and specification tests. Section 4 provides four sets of regressions results from ordinary least squares, instrumental variables, three-stage least squares, and seemingly unrelated regressio

2. Data Sources, Preparation and Descriptive Statistics

2.1 Data Sources

Tallest Building in each Country (as of June 2017): The Skyscraper Center lists all buildings in the world that are 150 meters or taller. For countries with buildings shorter than that, I used the tallest building in the country as listed on Emporis.com. In all specifications, the natural logarithm of the tallest building is used.

Happiness Index (average of 2014-2016): From the World Happiness Report. The data also available on Wikipedia. In some specifications, the natural logarithm of the Happiness Index is used. More details about the creating of the index is given in the report, but, in short, it measures the average response to surveys on life satisfaction, which can range from a possible low of one to a possible maximum of 10.

Human Development Index (HDI), Coefficient of Human Inequality & Palma Ratio. These data come from UNDP. The HDI and Coefficient of Human Inequality is from 2015. The Palma Ratio is average from 2010 to 2015.

Population and GDP (2016): GDP, from the World Bank, is in constant dollars and adjusted for purchasing power parity. Population data is also from the World Bank. The natural logarithms of population and GDP are used in all specifications.

2.2 Descriptive Statistics

Table 1 gives the descriptive statistics for the data set. The Happiness Index average is 5.36 out of 10, but ranges from 2.69 to 7.54. The HDI varies from 0.35 to 0.95 with an average of 0.70. The tallest building ranges from 24 meters to 828 meters, with an average of 159 meters.

{Table 1 here: Descriptive Stats for the Data Set}

3. Statistical Tests

This section describes the various tests performed in regard to estimation. All analyses were performed in Stata 15.1. The results are in Table 2.

{Table 2 here: Statistical Tests for Regression Analysis}

Given the system of equations above, generally speaking, joint equation estimation methods are preferred to equation-by-equation ordinarily least squares (OLS) for two reasons. First is the issue of endogeneity. Since height and happiness appear in both equations, one would suspect that these two variables introduce the standard endogeneity problem from simultaneous equations, e.g., in say Equation (1), $corr(happiness, \varepsilon_{1i}) \neq 0$ (Wooldridge, 2015). Regardless, simultaneous equation estimation methods generally produce estimates that are more efficient than OLS (Cameron and Trivedi, 2005).

The first set of tests performed relate to the heteroscedasticity of the errors. Three-stage least squares, for example, are not valid if the error terms are heteroskedastic. For this reason, the Breuch Pagan Test for Heteroscedasticity was performed on several specifications for both dependent variables, using OLS. In short, for the Happiness Index, none of the tests reject the null of homoscedasticity. For *ln(Tallest Building)*, two specifications reject no heteroscedasticity, while two do not. For those that reject homoscedasticity, it seems, however, that the results are sensitive to an outlier in one of the independent variables. For this reason, it does not appear that heteroscedasticity is a systematic problem.

Second, a series of instrumental variable tests were performed to test for (a) endogeneity of the explanatory variables, (b) the validity of the instruments, and (c) the strength of the instruments. For each equation, the endogenous variable was instrumented for by using explanatory variables that appeared in the other equation, but not the equation in question (these instruments varied depending the specification and can be seen in the tables below). For example, when testing for endogeneity of Equation (1), instruments for *ln(Tallest Building)* included total country population and regional dummies that affect height, but not happiness.

First, in all cases but one, the overidentification test suggests the instruments are valid; furthermore, the first stage F-stats are large enough across specifications to suggest they are strong instruments. Using these instruments, I find, at best, weak evidence for endogeneity in the Happiness equation, and no evidence of endogeneity in the height equation.

For this reason, I estimate both three-stage least squares and seemingly unrelated regression (SUR) models. Looking at the correlations of residuals provides weak evidence that the SUR models are appropriate.

Finally, in regard to specification, several OLS models were first run with various combinations of the variables described above. First, variables were excluded from the OLS regression if their t-stats were less than one (which would then raise the adjusted-R^2). Based on these OLS results different specifications for the three-stage models were run, and the models chosen have the lowest AIC and/or BIC values.

4. Results

Tables 3 – 6 present the results from ordinary least squares, instrumental variables, three-stage least squares, and seemingly unrelated regressions, respectively.

For the OLS results, Table 3A presents four specifications for the Happiness Index. Here we can see that all the tallest building coefficient estimates are positive, but none are statistically significant at the 90% or greater confidence level. Specification (3) in Table 3A suggests there may be a flattening or peak in the relationship, but significance of the quadratic term is insignificant. In Table 3B, we can see that the Happiness Index values are all positive, but insignificant.

Tables 4A and 4B present the results from instrumental variables regressions, with five specifications for each dependent variable. Similar to above, all coefficient estimates for the tallest building variable are positive. Also, in four out five specifications, the height coefficients is statistically significant. In Table 4B, we find positive coefficients for the happiness variable, but they are statistically insignificant.

Tables 5A and 5B show the results from three-stage least squares regressions. In this case, statistical significance appears in almost all of the specifications. Again, all coefficients are positive.

Finally, Tables 6A and 6B show the results for the seemingly unrelated regressions. They are quite similar to the three stage regressions; that is, they show positive and significant coefficients across nearly all specifications.

Note that across specifications there is evidence of a possible humped-shape for height of tallest building, as it effects happiness. But it is difficult to draw a conclusion about this because inclusion of the quadratic term is not statistical significant across specifications and introduces a multicollinearity problem with *ln(Tallest Building)* by rendering its standard errors much larger (when this happened the squared term was omitted). In no case do we find evidence for a quadratic relationship for the happiness variable as it affects building height.

Finally the positive and two-way relationship between height and happiness is made based on the results of the three-stage and seemingly unrelated regressions, which show statistical significance for these variables across most of the specifications.

References

Barr, J. M. (2016). *Building the Skyline: The Birth and Growth of Manhattan's Skyscrapers*. Oxford University Press.

Cameron, A. C., & Trivedi, P. K. (2005). *Microeconometrics: methods and applications*. Cambridge university press.

Frey, B. S. (2008). Happiness: A revolution in economics. *MIT Press Books*, *1*.

Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach*. Nelson Education.

Tables

VARIABLE	MEAN	STD. DEV.	MIN.	MAX.	OBS.	YEAR OF MEASUREMENT
HAPPINESS INDEX	5.36	1.14	2.69	7.54	152	2014-2016
HUMAN DEVELMENT INDEX	0.70	0.15	0.35	0.95	187	2015
TALLEST BUILDING (METERS)	158.8	125.6	24.0	828.0	163	June 2017
COEFF. OF HUMAN INEQUAL.	20.61	10.21	5.34	44.8	151	2015
PALMA RATIO	1.99	1.08	0.82	7.14	144	2010-2015
POPULATION (MILLIONS)	32.0	130.6	0.00	1,382	232	2015
GDP PER CAPITA ($PPP)	18,172	20,409	596	132,580	176	2016
AFRICA	0.251				231	
CARIBBEAN	0.113				231	
CENTRAL AMERICA	0.039				231	
EAST ASIA	0.121				231	
EASTERN EUROPE	0.043				231	
LATIN AMERICA	0.091				231	
MIDDLE EAST	0.056				231	
NORTH AM. (EXCL. MEX.)	0.022				231	
OCEANA	0.009				231	
WESTERN EUROPE	0.165				231	

Table 1: Descriptive Statistics for the data set. Sources: See Section 2.1

TEST	(1)	(2)	(3)	(4)	(5)
DEP. VAR.: HAPPINESS INDEX					
BRUECH PAGAN FOR HETEROSKEDASTICITY*	0.97	0.93	0.45	0.68	
IV TESTS					
ENDOGENEITY TEST (DURBIN)*	0.24	0.12	0.70	0.08	0.05
OVERIDENTIFICATION TEST (SARGAN)*	0.40	0.79	0.04	0.38	0.45
FIRST STAGE F-STAT.	60.3	52.7	65.3	9.8	52.7
DEP. VAR.: LN(TALLEST BUILDING)					
BRUECH PAGAN FOR HETEROSKEDASTICITY		0.14	0.06	0.07	0.76
IV TESTS					
ENDOGENEITY TEST (DURBIN)*	0.68	0.25	0.35	0.66	0.28
OVERIDENTIFICATION TEST (SARGAN)*	0.94	0.76	0.35	0.42	0.49
FIRST STAGE F-STAT.	14.5	13.6	12.8	10.6	12.8
THREE STATE LEAST SQUARES SYSTEM					
LOG LIKELIHOOD	-108.5	-115.9	-129.3	-125.5	-147.7
AIC	247	261.7	290.5	287	325.3
BIC	287.9	303.7	336.7	339.1	368.7
SEEMINGLY UNRELATED REGRESSION SYSTEM					
LOG LIKELIHOOD	-109.8	-16.9	-129.6	-125.9	-149.5
AIC	249.6	263.9	291.3	287.8	329
BIC	290.5	305.8	337.5	339.8	372.4
BREUSCH PAGAN TEST OF INDEPENDENCE*	0.12	0.09	0.29	0.17	0.12
NOBS.	113	121	133	133	133

*Table 2: Statistical tests for regression analysis. See text for more information. *p-value.*

DEP. VAR.: HAPPINESS INDEX				
VARIABLE	**(1)**	**(2)**	**(3)**	**(4)**
LN(TALLEST BUILDING)	0.14	0.11	0.07	1.29
	0.18	0.30	0.47	0.15
LN(TALLEST BUILDING)^2				-0.13
				0.14
HUMAN DEV. INDEX			2.86	2.79
			0.01	0.02
PALMA RATIO	-0.16			
	0.00			
COEF. HUMAN INEQUALITY		-0.022		
		0.01		
LN(GDP PER CAPITA)	0.63	0.52	-1.44	-1.96
	0.00	0.00	0.04	0.01
LN(GDP PER CAPITA)^2			0.097	0.127
			0.01	0.00
LATIN AMERICA DUMMY	1.15	1.08	1.05	0.94
	0.00	0.00	0.00	0.00
NORTH AMERICA DUMMY	0.85	0.91	0.66	0.64
	0.04	0.03	0.10	0.11
OCEANA DUMMY	1.02	1.04	0.94	0.80
	0.07	0.07	0.02	0.04
WESTERN EUROPE DUMMY	0.36	0.38	0.27	
	0.03	0.02	0.09	
AFRICA DUMMY				-0.193
				0.22
CONSTANT	-1.08	0.24	7.67	7.23
	0.06	0.78	0.01	0.03
NOBS.	113	121	133	133
R^2	0.79	0.78	0.79	0.79
LIKELIHOOD	-87.0	-96.1	-100.6	-100.3
AIC	190.0	208.1	219.3	220.7
BIC	211.8	230.5	245.3	249.6

Table 3A: OLS regression results for the Happiness Index. Note: p-values below estimates. p-values of 0.1 or smaller indicate statistical significance at 90% confidence level or greater.

DEP. VAR.: LN(TALLEST BUILDING HEIGHT)

VARIABLE	(1)	(2)	(3)	(4)
LN(HAPPINESS INDEX)	0.075	0.154	0.127	0.021
	0.73	0.49	0.56	0.94
LN(# SKYSCRAPERS)	0.293	0.181	0.275	
	0.00	0.00	0.00	
LN(# SKYSCRAPERS)^2	-0.021		-0.018	
	0.03		0.06	
LN(GDP PER CAPITA)	0.214	0.208	0.199	0.403
	0.00	0.00	0.00	0.00
LN(POPULATION)	0.100	0.110	0.104	0.223
	0.00	0.00	0.00	0.00
WESTERN EUROPE DUMMY	-0.134	-0.106	-0.105	-0.306
	0.11	0.21	0.21	0.00
MIDDLE EAST DUMMY		0.244	0.207	0.304
		0.03	0.07	0.03
CONSTANT	0.915	0.694	0.898	-2.531
	0.14	0.25	0.14	0.00
NOBS.	134	134	134	134
R^2	0.78	0.77	0.78	0.68
LIKELIHOOD	-30.7	-31.0	-29.0	-54.4
AIC	75.5	75.9	74.0	120.8
BIC	95.8	96.2	97.2	138.2

Table 3B: OLS regressions for tallest building in each nation. Note: p-values below estimates. p-values of 0.1 or smaller indicate statistical significance at 90% confidence level or greater.

DEP. VAR.: HAPPINESS INDEX					
VARIABLE	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
LN(TALLEST BUILDING)	0.25	0.25	0.10	4.42	0.26
	0.07	0.07	0.41	0.01	0.06
LN(TALLEST BUILDING)^2				-0.43	
				0.01	
HDI			2.84	2.49	2.68
			0.01	0.04	0.01
PALMA RATIO	-0.16				
	0.00				
COEF. HUMAN INEQUALITY		-0.02			
		0.01			
LN(GDP PER CAPITA)	0.59	0.47	-1.4	-2.6	-1.46
	0.00	0.00	0.03	0.00	0.03
LN(GDP PER CAPITA)^2			0.10	0.16	0.10
			0.00	0.00	0.01
LATIN AMERICA DUMMY	1.15	1.07	1.05	0.88	1.06
	0.00	0.00	0.00	0.00	0.00
NORTH AMERICA DUMMY	0.79	0.83	0.65	0.73	0.60
	0.05	0.04	0.09	0.08	0.13
OCEANA DUMMY	0.99	0.99	0.94	0.74	0.97
	0.07	0.08	0.02	0.06	0.01
WESTERN EUROPE DUMMY	0.42	0.44	0.29		0.39
	0.01	0.01	0.07		0.02
AFRICA DUMMY				-0.20	
				0.21	
CONSTANT	-1.3	-0.02	7.6	2.6	7.2
	0.03	0.98	0.01	0.51	0.02
NOBS.	113	121	133	133	133
R^2	0.79	0.78	0.79	0.77	0.78

Table 4A: Instrumental variable regressions for the Happiness Index in each nation. Note: p-values below estimates. p-values of 0.1 or smaller indicate statistical significance at 90% confidence level or greater.

DEP. VAR.: LN(TALLEST BUILDING HEIGHT)					
VARIABLE	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
LN(HAPPINESS INDEX)	0.29	0.53	0.51	0.29	0.54
	0.46	0.18	0.21	0.46	0.27
LN(# SKYSCRAPERS)	0.26	0.31	0.18	0.27	
	0.00	0.00	0.00	0.00	
LN(# SKYSCRAPERS)^2	-0.02	-0.03		-0.02	
	0.03	0.01		0.08	
LN(GDP PER CAPITA)	0.18	0.14	0.15	0.17	0.31
	0.02	0.04	0.05	0.02	0.00
LN(POPULATION)	0.12	0.11	0.11	0.10	0.22
	0.00	0.00	0.00	0.00	0.00
WESTERN EUROPE	-0.10	-0.13	-0.10	-0.10	-0.29
	0.26	0.13	0.24	0.22	0.00
MIDDLE EAST			0.28	0.23	0.36
			0.02	0.05	0.01
CONSTANT	0.50	0.67	0.66	0.86	-2.58
	0.46	0.29	0.27	0.15	0.00
NOBS.	113	121	133	133	133
R^2	0.7	0.7	0.8	0.8	0.7

Table 4B: Instrumental variable regressions for height of the tallest building in each nation. Note: p-values below estimates. p-values of 0.1 or smaller indicate statistical significance at 90% confidence level or greater.

DEP. VAR.: HAPPINESS INDEX

VARIABLE	(1)	(2)	(3)	(4)	(5)
LN(TALLEST BUILDING)	0.29	0.24	0.14	3.41	0.20
	0.03	0.08	0.25	0.01	0.14
LN(TALLEST BUILDING)^2				-0.32	
				0.01	
HDI			2.92	2.81	3.14
			0.01	0.01	0.00
PALMA RATIO	-0.15				
	0.00				
COEF. HUMAN INEQUALITY		-0.02			
		0.00			
LN(GDP PER CAPITA)	0.58	0.46	-1.39	-2.10	-1.66
	0.00	0.00	0.04	0.00	0.01
LN(GDP PER CAPITA)^2			0.09	0.13	0.10
			0.01	0.00	0.00
LATIN AMERICA DUMMY	1.13	1.06	1.05	0.97	1.03
	0.00	0.00	0.00	0.00	0.00
NORTH AMERICA DUMMY	0.74	0.84	0.58	0.70	0.58
	0.06	0.04	0.14	0.07	0.13
OCEANA DUMMY	0.93	0.95	0.93	0.82	0.92
	0.08	0.08	0.02	0.03	0.02
WESTERN EUROPE DUMMY	0.43	0.43	0.31	0.21	0.33
	0.01	0.01	0.06	0.19	0.05
CONSTANT	-1.36	0.11	7.21	2.39	8.21
	0.02	0.90	0.01	0.49	0.00

Table 5A: Three-stage least squares regressions for the Happiness Index in each nation. Note: p-values below estimates. p-values of 0.1 or smaller indicate statistical significance at 90% confidence level or greater. See Table 5B for specification statistics.

DEP. VAR.: LN(TALLEST BUILDING HEIGHT)

VARIABLE	(1)	(2)	(3)	(4)	(5)
LN(HAPPINESS INDEX)	0.60	0.59	0.45	0.49	0.64
	0.01	0.01	0.04	0.03	0.01
LN(# SKYSCRAPERS)	0.26	0.31	0.17	0.26	
	0.00	0.00	0.00	0.00	
LN(# SKYSCRAPERS)^2	-0.02	-0.03		-0.01	
	0.02	0.01		0.10	
LN(GDP PER CAPITA)	0.13	0.14	0.16	0.14	0.30
	0.02	0.01	0.00	0.00	0.00
LN(POPULATION)	0.12	0.11	0.12	0.11	0.23
	0.00	0.00	0.00	0.00	0.00
WESTERN EUROPE	-0.10	-0.13	-0.10	-0.10	-0.29
	0.25	0.13	0.22	0.22	0.00
MIDDLE EAST			0.27	0.24	0.35
			0.01	0.03	0.01
CONSTANT	0.51	0.58	0.50	0.78	-2.64
	0.45	0.35	0.39	0.19	0.00
N	113	121	133	133	133
LOG LIKELIHOOD	-108.5	-115.9	-129.3	-125.5	-147.7
AIC	247	261.7	290.5	287.0	325.3
BIC	287.9	303.7	336.7	339.1	368.7

Table 5B: Three-stage least squares regressions for height of the tallest building in each nation. Note: p-values below estimates. p-values of 0.1 or smaller indicate statistical significance at 90% confidence level or greater.

DEP. VAR.: HAPPINESS INDEX

VARIABLE	(1)	(2)	(3)	(4)	(5)
LN(TALLEST BUILDING)	0.24	0.23	0.13	1.41	0.17
	0.02	0.03	0.16	0.10	0.06
LN(TALLEST BUILDING)^2				-0.127	
				0.14	
HUMAN DEVEL. INDEX			2.90	2.87	3.03
			0.01	0.01	0.00
PALMA RATIO	-0.15				
	0.00				
COEF. HUMAN INEQUALITY		-0.02			
		0.00			
LN(GDP PER CAPITA)	0.60	0.47	-1.40	-1.68	-1.59
	0.00	0.00	0.03	0.01	0.02
LN(GDP PER CAPITA)^2			0.09	0.11	0.10
			0.01	0.00	0.00
LATIN AMERICA DUMMY	1.15	1.07	1.05	1.02	1.05
	0.00	0.00	0.00	0.00	0.00
NORTH AMERICA DUMMY	0.78	0.85	0.60	0.65	0.61
	0.05	0.03	0.12	0.09	0.12
OCEANA DUMMY	0.96	0.97	0.93	0.89	0.94
	0.07	0.08	0.02	0.02	0.02
WESTERN EUROPE DUMMY	0.41	0.42	0.31	0.26	0.32
	0.01	0.01	0.05	0.10	0.04
CONSTANT	-1.26	0.12	7.31	5.42	7.98
	0.02	0.89	0.01	0.08	0.01

Table 6A: Seemingly unrelated regressions for the Happiness Index in each nation.n Note: p-values below estimates. p-values of 0.1 or smaller indicate statistical significance at 90% confidence level or greater. See Table 6B for specification statistics.

DEP. VAR.: LN(TALLEST BUILDING HEIGHT)

VARIABLE	(1)	(2)	(3)	(4)	(5)
LN(HAPPINESS INDEX)	0.45	0.46	0.38	0.39	0.43
	0.06	0.04	0.09	0.08	0.10
LN(# SKYSCRAPERS)	0.26	0.31	0.18	0.26	
	0.00	0.00	0.00	0.00	
LN(# SKYSCRAPERS)^2	-0.02	-0.03		-0.02	
	0.02	0.01		0.07	
LN(GDP PER CAPITA)	0.15	0.16	0.17	0.16	0.33
	0.00	0.00	0.00	0.00	0.00
LN(POPULATION)	0.12	0.11	0.12	0.11	0.23
	0.00	0.00	0.00	0.00	0.00
WESTERN EUROPE	-0.10	-0.13	-0.10	-0.10	-0.28
	0.26	0.13	0.23	0.21	0.00
MIDDLE EAST			0.27	0.23	0.34
			0.02	0.04	0.01
CONSTANT	0.50	0.61	0.54	0.76	-2.62
	0.46	0.33	0.36	0.20	0.00
NOBS.	113	121	133	133	133
LOG LIKELIHOOD	-109.8	-116.9	-129.6	-125.9	-149.5
AIC	249.6	263.9	291.3	287.8	329
BIC	290.5	305.8	337.5	339.8	372.4

Table 6B: Seemingly unrelated regressions for height of the tallest building in each nation. Note: p-values below estimates. p-values of 0.1 or smaller indicate statistical significance at 90% confidence level or greater.