

Business as Usual: Corruption and Business Activity

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A regression analysis is used to verify the determinants of corruption. Using a cross-sectional data set of 48 countries, a significant relationship between GDP per capita and the level of corruption is confirmed. However, it is likely that GDP per capita is a determinant of corruption and affected by corruption. An instrumental variable technique is used to help determine the true impact of GDP per capita on corruption.

Key Words: GDP per Capita, Transparency International, corruption, freedom, government interference, bureaucracy,

I. Introduction

Corruption - what causes it, its costs, and remedies - is a major concern in international business today. Corruption has been blamed for underdevelopment in some countries and a lack of foreign investment in others. Corruption is the result of too much government interference in the economy, or not enough government oversight. Corruption stems from a lack of competition according to some analysts, while others highlight cultural factors, and still others focus on low wages among bureaucrats.

Remedies to fight corruption run the gamut from promoting development and competition to invoking stiffer penalties for the individuals involved (Klitgaard, 2000).

All of this points to a multi-faceted problem with entangled causes. A better understanding of the causes of corruption would help in the design of policies to overcome it. For instance, if corruption is found to be primarily the result of badly functioning large bureaucracies, then attention could be devoted to improving the functionality of national and business institutions.

On the other hand, if corruption is rampant primarily in economies where governmental restrictions are prevalent, then an opening up of the economy to competition and a reduction in regulation will help.

The reasons why corruption is prevalent in some countries are not well understood. Consider the theory that governments that are heavily involved in their economies, whether it is redistributing income or granting licenses for foreign trade, promote corruption. The idea certainly has intuitive appeal and some anecdotal evidence stands

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behind it. Vietnam and India have relatively high rates of government interference in economic matters and both have high levels of corruption. But Denmark, Norway, and Finland have very high levels of government intrusion in their economies and some of the lowest levels of corruption in the world.

II. Measuring Corruption

The standard definition of corruption comes from Nye (1967, pg. 966): "Corruption is behavior which deviates from the formal duties of a public role because of private-regarding (personal, close family, private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding influence." This broad definition allows for most forms of corruption - bribery, coercion, kickbacks, protection, and other illegal forms of business and politics.

In 1995 Transparency International, an organization "dedicated to curbing both international and national corruption", began releasing its annual Corruption Perceptions Index (CPI). The CPI is an index of indexes in that it combines various surveys and measures of corruption into a single number based on a scale from 0 to 10. The 1999 CPI covers 99 countries and includes data from the following sources:

- Freedom House Nations in Transit
- Gallup International
- The Economist Intelligence Unit
- The Institute for Management Development, Lausanne
- The International Crime Victim Survey
- The Political and Economic Risk Consultancy, Hong Kong
- The Wall Street Journal, Central European Economic Review
- The World Bank and University of Basel
- The World Economic Forum

A detailed methodology of the CPI is available at Transparency International's website (www.transparency.de/). Transparency International's measure of corruption corresponds to Nye's classic definition.

Denmark scores highest in the 1999 version of the CPI as it did in 1998. The CPI indicates that there is virtually no corruption in Denmark. Several Scandinavian countries are in the top 10. Cameroon ranks dead last as the nation with the most corruption in 1999. Many African countries appear at the bottom of the rankings.

III. The Determinants of Corruption

The goal of this paper is to delineate the factors affecting a nation's CPI score. A review of the empirical research in this regard is summarized in Lambsdorff (1999). Previous investigations have considered

- GDP or Business Activity
- Government Involvement
- Institutional Quality
- Lack of Competition
- Poverty and Inequality
- Wages and Salaries
- Cultural Factors
- Natural Resource Abundance
- Trading Partners
- Demographic Factors

Notice that this list of determinants is only a list of major categories. For instance, under Cultural Factors, researchers have considered variables as disparate as a nation's colonial heritage contributing to corruption (Swamy et al., 1999), as well as hierarchical forms of religion (La Porta et al., 1997).

The empirical investigation undertaken in this paper considered the following set of particular variables as possible determinants of a given nation's level of corruption:

- GDP per capita
- Index of Economic Freedom of The Heritage Foundation
- Number of military personnel per 1000 persons
- Percent of the population over 65 years of age
- Population per square mile
- Year of independence
- Energy consumption per capita
- Output per unit of energy consumed
- A dummy variable equal to 1 if a nation trades heavily with Belgium, France, Italy, Netherlands, or South Korea (These nations have a reputation for readily offering bribes.)

Economic freedom is measured with an index compiled by The Heritage Foundation. It measures how well a nation scores on a list of 50 independent variables that have been divided into 10 broad factors of economic freedom. The 10 factors are:

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- Trade policy
- Fiscal burden of government
- Government intervention in the economy
- Monetary policy
- Capital flows and foreign investment
- Banking
- Wages and prices
- Property rights
- Regulation
- Black market

A complete methodology of the Index of Economic Freedom of The Heritage Foundation is available on the internet at <http://www.heritage.org/index/execsum.html>

Only the first two proposed determinants of corruption, GDP per capita and economic freedom, are statistically significant at the 5 percent critical level in a set of regressions encompassing 48 countries. (The complete data set appears as an appendix to this paper.) A typical result is:

$$\text{CORPT}_i = 9.37 - 0.000169 \text{ GDP}_i - 1.05 \text{ FREE}_i - 0.005 \text{ MILI}_i$$

(11.3)* (-4.4)* (-2.1)* (-0.21) t-ratios ; $R^2 = .75$

Where CORPT_i is the level of corruption of the i th nation
 GDP_i is GDP per capita
 FREE_i is the index of economic freedom
 MILI_i is the number of military personnel per 1000 persons

* indicates significance at the 5 percent critical level

This result is typical in that once GDP and FREE are included as explanatory variables, none of the other explanatory variables listed is significant when added to the regression. Notice that the first two explanatory variables attain their expected signs. GDP has a negative coefficient indicating that countries with higher GDP per capita generally will have lower levels of corruption. FREE also has a negative coefficient. This implies that countries that are more open to international trade, with less government interference in the economy, fewer regulations, and more clearly defined property rights have less

corruption. MILI has a negative coefficient when a positive relationship is expected, but the coefficient is not statistically significant.

Later we will use the result that population per square mile (POP) and percent of the population over 65 years old (SIXTY5) are not significant determinants of corruption:

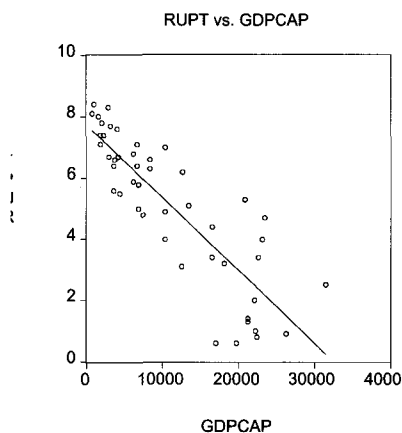
$$\text{CORPT}_i = 9.34 - 0.000170 \text{ GDP}_i - 1.05 \text{ FREE}_i + 0.000002 \text{ POP}_i$$

(11.4)* (-4.4)* (-2.1)* (0.02) t-ratios ; $R^2 = .75$

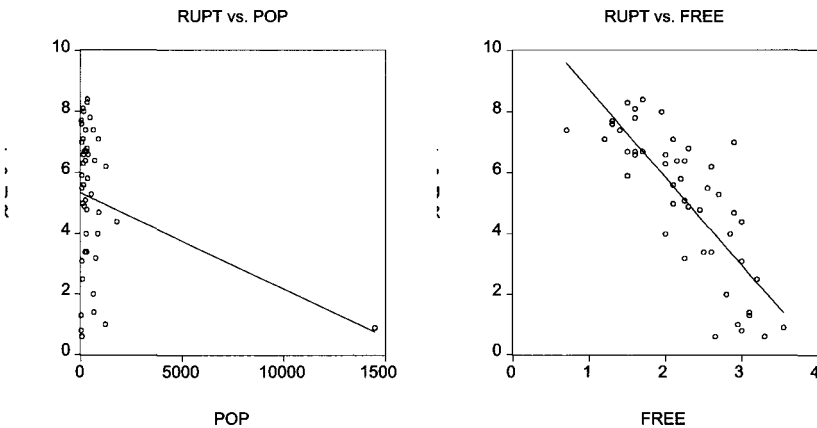
$$\text{CORPT}_i = 9.62 - 0.000153 \text{ GDP}_i - 1.13 \text{ FREE}_i - 0.029 \text{ SIXTY5}_i$$

(10.4)* (-3.3)* (-2.2)* (-0.62) t-ratios ; $R^2 = .76$

The conclusion to be drawn from these preliminary regressions is that GDP per capita and economic freedom are the primary determinants of corruption. Scattergrams bolster the conclusion.

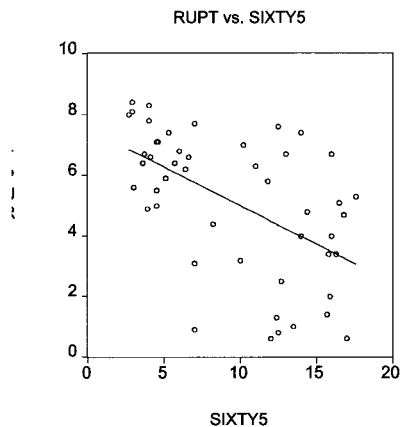


Scattergrams also verify that population per square mile (POP) and percent of the population over 65 years old (SIXTY5) are not related to the level of corruption.



Singapore is the outlier in scattergram of POP on RUPT. Even without it, there is no relationship between POP and RUPT since the regression line would be almost vertical.

The scattergram of SIXTY5 on RUPT has a negative slope, but the relationship is not statistically significant.



The conclusion that GDP per capita and economic freedom are the primary determinants of the level of corruption must be tempered because of the econometric deficiencies of the regressions above.

IV. Simultaneity Bias

The regressions used to draw the conclusion that GDP per capita and economic freedom are the primary determinants of the level of corruption suffer from simultaneity bias. Specifically, GDP per capita is used to explain the level of corruption, but the level of corruption across nations affects their GDP per capita. In other words, the regressions suffer from reverse causality.

Indeed, it is only hearty intuition that suggests GDP per capita will affect corruption. The reasoning is that poor nations will not have the resources to fight corruption, or their citizens will be forced to resort to corruption to survive. Whereas the idea that corruption affects GDP has a vast economic literature behind it. The notion that corruption is a form of rent-seeking that wastes resources and therefore lowers GDP goes back to the 1960s. Krueger's (1974) paper is an especially elegant theoretical exposition of the welfare loss from rent-seeking.

Notice that there is likely to be a simultaneous relationship between economic freedom and corruption as well. The measure of economic freedom includes information on the degree of government regulation and intervention, capital flows, and trade policies that are likely to affect the level of corruption.

When the dependent variable in a regression feeds back onto an independent variable, ordinary least-squares estimates of the structural parameters are biased. Instrumental variables or two-stage least-squares are techniques designed to overcome simultaneity bias.

The basic idea behind instrumental variables is to replace the tainted independent variable with another variable that is highly correlated with it, but is not impacted by the feedback from the dependent variable. Two-stage least-squares creates the variable to be used as an instrument in the first stage and then applies ordinary least-squares using the instrument in the second stage.

In this specific case, a good instrument for GDP per capita will be highly correlated with GDP per capita but not with corruption. We know from our investigation that population per square mile (POP) and percent of the population over 65 years old (SIXTY5) are not related to the level of corruption. However, each of these variables is correlated with GDP per capita. A regression of both on GDP per capita yields:

$$\text{GDP}_i = -348.56 + 1.40 \text{POP}_i + 1094.31 \text{SIXTY5}_i$$

(-0.2) (3.3)* (6.3)* ← t-ratios ; $R^2 = .52$

Population per square mile (POP) and percent of the population over 65 years old (SIXTY5) will also serve as good instruments for

economic freedom. Again, both are not related to corruption, but a regression indicates that they are correlated with economic freedom:

$$\text{FREE}_i = 1.64 + 0.000108 \text{POP}_i + 0.06 \text{SIXTY5}_i$$

(9.2)* (2.7)* (3.5)* t-ratios ; $R^2 = .29$

The predicted values of GDP and FREE from these two regressions are used as the instruments for the actual values of GDP and FREE in the second stage of two-stage least squares. The second stage regression yields:

$$\text{CORPT}_i = 8.53 - 0.000214 \text{GDP}_i - 0.47 \text{FREE}_i$$

(2.0) (-1.4) (-0.2) t-ratios ; $R^2 = .75$

Neither GDP per capita or economic freedom is statistically significant in the second stage regression. The constant term has the highest t-ratio and is almost statistically significant at the 5 percent critical level. The regression suggests that GDP per capita and economic freedom are not determinants of corruption.

This makes for a dramatic conclusion, but the results are not robust. If GDP or FREE is stipulated to be the sole independent variable in a two-stage least-squares regression, then each is found, separately, to be statistically significant. Moreover, the results shown above could change if better instruments for GDP and FREE were found. Kaufmann et al. (1999) and Hall and Jones (1999) report significant results using the proportion of the population that speaks English or French as the instrument for economic freedom.

V. Conclusion

Economic theory indicates that the amount of corruption in a country will affect its level of output. Empirical evidence shows that a country's level of output is related to the amount of corruption. Two-stages least-squares estimation on a cross-sectional data set of 48 countries suggests that GDP per capita and economic freedom have no impact on the level of corruption. This means that economic theory prevails and corruption affects business activity, not visa-versa.

The two-stage least-squares results, however, are not robust. When GDP per capita is used as the sole independent variable in a two-stage least-squares estimation, it has a significant impact on the level of corruption.

The primary value of this paper is to suggest that more research in this area is warranted. And care should be taken in the conduct of that

research since the results seem to be sensitive to the specification of the model and the choice of instruments.

Nation	CPI	Pop / sq	%>65	GDP / cap	Aforces / 1000	Indep year	Trade partner	Econ freedom	Ener / cap	Output / ener
Argentina	3.0	34	10.2	10300	1.9	1816	0	2.1	74	139
Australia	8.7	6	12.4	21200	3.2	1901	0	1.9	223	95
Belgium	5.3	872	16.8	23400	4.6	1830	0	2.1	247	95
Brazil	4.1	52	5.1	6100	1.8	1822	0	3.5	46	133
Bulgaria	3.3	193	16.0	4100	10.0	1908	0	3.4	115	36
Canada	9.2	9	12.5	22400	2.5	1867	0	2.0	407	55
Chile	6.9	51	7.0	12500	7.2	1810	0	2.0	55	227
China	3.4	343	6.6	3600	2.4	1912	0	3.4	30	120
Colombia	2.9	96	4.5	6600	4.0	1810	0	2.9	36	183
Egypt	3.3	172	3.7	2850	6.9	1922	0	3.5	27	106
France	6.6	279	15.8	22600	8.7	486	1	2.5	169	134
Germany	8.0	607	15.9	22100	4.2	1871	1	2.2	176	126
Greece	4.9	211	16.5	13400	20.3	1829	1	2.75	112	120
Hungary	5.2	286	14.4	7400	7.0	1001	0	2.55	112	66
India	2.9	857	4.6	1720	1.4	1947	0	3.8	12	143
Indonesia	1.7	302	4.0	2830	1.4	1945	0	3.5	18	157
Israel	6.8	719	10.0	18100	34.9	1948	0	2.75	112	162
Italy	4.7	500	17.6	20800	7.6	1861	1	2.3	131	159
Japan	6.0	826	16.0	23100	1.9	-660	0	2.15	170	136
Jordan	4.4	125	3.0	3500	27.3	1946	0	2.9	NA	NA
Kazakhstan	2.3	16	7.0	3100	1.7	1991	0	3.7	NA	NA
Kenya	2.0	129	2.7	1550	0.8	1963	0	3.05	NA	NA
Korean, S	3.8	1224	6.4	12600	14.5	1945	0	2.4	157	80
Malaysia	5.1	165	3.9	10300	6.2	1957	0	2.7	81	127
Mexico	3.4	133	4.1	8300	1.9	1810	0	3.0	58	143
Netherlands	9.0	1200	13.5	22200	4.3	1579	1	2.05	242	92
N Zealand	9.4	35	12.0	17000	2.9	1907	0	1.7	247	69
Nigeria	1.6	314	2.9	960	0.9	1960	1	3.3	7	137
Pakistan	2.2	449	4.0	2000	4.6	1947	0	3.4	13	154
Peru	4.5	53	4.5	4300	4.8	1821	0	2.45	21	205
Philippines	3.6	675	3.6	3500	1.5	1946	0	2.85	14	250
Poland	4.2	328	11.8	6800	7.2	1918	1	2.8	98	69
Romania	3.3	252	13.0	4050	9.5	1881	1	3.3	93	44
Russia	2.4	22	12.5	4000	9.4	1991	0	3.7	176	23
Singapore	9.1	14487	7.0	26300	18.0	1965	0	1.45	NA	NA
Slovakia	3.7	111	11.0	8300	9.7	1993	0	3.0	NA	NA
Slovenia	6.0	252	14.0	10300	5.1	1991	1	3.0	NA	NA
S Africa	5.0	91	4.5	6800	2.4	1910	0	2.9	100	68

Spain	6.6	203	16.3	16500	5.4	1492	1	2.4	115	143
Sweden	9.4	56	17.0	19700	5.8	1523	0	2.35	255	77
Taiwan	5.6	1759	8.2	16500	20.0	1947	0	2.0	145	114
Tanzania	1.9	89	2.9	730	1.2	1964	0	3.4	NA	NA
Thailand	3.2	304	6.0	6100	4.9	1238	0	2.7	39	156
Turkey	3.6	217	5.7	6600	13.1	1923	0	2.75	43	153
Ukraine	2.6	215	14.0	2200	9.3	1991	0	3.6	122	18
UK	8.6	632	15.7	21200	4.0	900	1	1.9	171	124
USA	7.5	76	12.7	31500	6.2	1776	0	1.8	352	89
Vietnam	2.6	607	5.3	1770	7.6	1945	0	4.3	6	295

References

- Goel, R.K. and M.A. Nelson
 1998, "Corruption and Government Size: A Disaggregated Analysis", *Public Choice*, XCVII, 107-20.
- Hall, R. and C. Jones
 1999, "Why do Some Countries Produce so Much More Output per Worker than Others", *Quarterly Journal of Economics*, CXIV, 83-116.
- Hutchcroft, Paul
 1997, "The Politics of Privilege: Assessing the Impact of Rents, Corruption and Clientelism on Third World Development", *Political Studies*, vol. 45, 639-58.
- Johnson, S., D. Kaufmann and P. Zoido-Lobaton
 1998, "Regulatory Discretion and the Unofficial Economy", *The American Economic Review*, *Papers and Proceedings*, LXXXVIII, 387-92.
- Kaufmann, D., A. Kraay and P. Zoido-Lobaton
 1999, "Governance Matters", *World Bank Policy Research Working Paper No. 2196*, October Washington D.C.: The World Bank.
- Klitgaard, R.
 2000, "Subverting Corruption", *Finance and Development*, June, 2-5. Krueger, A.O. 1974, "The Political Economy of the Rent-Seeking Society", *American Economic Review*, LXIV, 291-303.
- Lambsdorff, J.
 1999, "Corruption in Empirical Research - A Review", *Transparency International Working Paper*, www.transparency.de/documents/work-papers/lambsdorff_eresearch.html.
- La Porta, R., F. Lopez-De-Silanes, A. Shleifer and R.W. Vishny
 1997, "Trust in Large Organisations", *The American Economic Review*, *Papers and Proceedings*, CXXXVII (2), 333-8.
- Leite, C. and J. Weidmann
 1999, "Does Mother Nature Corrupt? Natural Resources, Corruption, and Economic Growth", *International Monetary Fund Working Paper*, 99/85, July.
- Mauro, P.
 1995, "Corruption and Growth", *Quarterly Journal of Economics*, CX, 681-712.

- Mauro, P.
1998, "Corruption and the Composition of Government Expenditure ", Journal of Public Economics, LXIX, 263-79.
- Nye, J.
1967, "Corruption and Political Development: A Cost-Benefit Analysis", in A. Heidenheimer et al. 1989, *Political Corruption: A Handbook*, (New York: Transaction Publishers).
- O'Driscoll, Gerald P., Jr., K. Holmes and M. Kirkpatrick
2000 *2000 Index of Economic Freedom*, (Washington, D.C.: The Heritage Foundation).
- Rijckeghem, C. Van and Weder, B.
1997, "Corruption and the Rate of Temptation: Do Low Wages in the Civil Service Cause Corruption?", International Monetary Fund Working Paper, 97/73.
- Swamy, A., St. Knack, Y. Lee and O. Azfar
1999, "Gender and Corruption", Draft Paper, IRIS Center, University of Maryland, July.

JOYRIDE TO INFINITY

ROBERT A. MCCONNELL PH.D.

Joyride to Infinity is an alarm-sounding book that manages to be at the same time both conservative and radical in its encyclopedic exploration of our future.

The theme is over-population and the resultant evils of mass immigration and environmental pollution. If mankind cannot control its actions, Nature, in her cruelty, will do it for us. The author is a reluctant radical who was forced to acknowledge the extreme findings that he uncovered in his exhaustive pursuit of reality.

Professor McConnell argues that the globalization of our economy is leading to the end of nationhood, mass migration and the uncontrolled growth of population. The causal links are now clear. He sees no hope for sub-Saharan Africa and little hope for China, which faced its population problem too late. The rest of the world is having to cope with the overflow from the regions that are over-reproducing.

Planning for the future requires caring about the future. Those cultures which have no past to preserve will have no future to live in. Cultural Diversity, which begins by denying the past, will never summon the will to sacrifice for the preservation of the Earth as a worthy habitat.

The author is both an engineer and a scientist. As an engineer, his competence was proved as a radar development group leader in World War II. As a scientist with a Ph.D. in physics he is a Research Professor Emeritus of Biological Science, a Life Senior Member of the Institute of Electrical and Electronics Engineers, a Fellow of the American Psychological Society, and a Fellow of the American Association for the Advancement of Science.

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BOOK REVIEW ARTICLE

The Internet Bubble Updated

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The Internet Bubble, published during the information technology bull market, argued that internet stocks were overvalued. The article discusses the role of investors in one of the largest speculative run ups of history, discussing how the bubble occurred and some of the effects of its demise.

Key Words: Risk capital, venture capitalist, internet stocks, market capitalization, speculative

It has now become clear that the great run up in Internet stocks was a bubble. But in the middle of the bubble who had the courage to say so at the time, and to write a book so arguing. The answer is Anthony B. Perkins and Michael C. Perkins, writers for the investment magazine *Red Herring*. Their book is titled *The Internet Bubble* (Harper Business, 1999). While most books on new technologies and social trends have a gee whiz characteristic about them, with investment books on technology emphasizing the money to be made, here is a book emphasizing that these stocks had become overvalued, and even attempting to estimate by how much.

Vast fortunes have been made and lost in Internet stocks. It is now becoming clear that this was one of the great speculative run ups of all time, if not the greatest. The Perkins' provide an account of this episode and where much of the money was made. It is clear the fortunes were made by insiders; company founders, venture capitalists, and investment bankers, many institutional investors, as well as by some lucky outside investors. The losers appear to have been small individual investors who bought in at the wrong time.

Besides providing an account of the Internet mania, the book provides descriptions of key players and how they interacted to create and support the bubble. The process starts with an entrepreneur with an idea and the drive to convert this into a company. The examples

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