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ADDING TO THE ECONOMIC MODEL?

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Corruption and religion

Adding to the economic model?

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Abstract: The cross-country pattern in the 1998 corruption index from Transparency International is explained by a mixed economic-cultural model of corruption: (1) The economic model uses the level of real income per capita, the rate of inflation and the level of economic freedom. (2) The cultural model uses a set of variables giving the shares of 11 religions in each country, and the Herfindahl - index for religious diversity. The economic model explains the larger part of the variance, but the religions prove to have considerable additional explanatory power. The largest divide is within the Christians. By far the least corrupt are the Protestant and Anglicans, while Catholics, and other »Pre-Reform« Christians, deviate to the other side - as do Buddhists. Further, it is demonstrated that the more religiously divided a country, the less corrupt it is.

Key words: Corruption, economic transition, religion Jel: K49, O11, P50

Most of the cross-country pattern of corruption can be explained by a simple economic model as shown in Paldam (1999). However, considerable residuals remain. This article is an attempt to reduce the residuals by considering the impacts of religion. The basis for this attempt is the logic of Table 1:

Table 1. The logical basis for the article

	Two claims and a corollary	Empirical status
A	Religion is a key determinant of »culture«	Obvious. Also reverse causality
B	Corruption has a (strong) »cultural« factor	Likely, but evidence sporadic
C	Religion is a determinant of corruption	Analyzed by article

»Culture« is a nebulous concept defying quantification, but reasonably good statistics exists for the cross-country pattern of religion. Therefore, it is possible to analyze the reduced-form relation between religion and corruption in a static cross-country framework.

1. Andreas Blom has been research assistant. The paper is the second outcome of a project under the Center of Dynamic Economics. The start of the paper was a comment by Johann Graf Lambsdorff to the first paper in the project. Address of author: MP, Dept. of Economics, University of Aarhus, 8000 Aarhus C, Denmark. E-mail: <mpaldam@econ.au.dk> see also netsources.

The dependent variable is the κ-index from the NGO *Transparency International* (see net-sources). It aggregates polls measuring *perception*s of corruption from many countries. The latest posting has increased the coverage by 30 countries to a total of 85 (due to limitations in the availability of other data this study uses only 78 countries). The country value given is calculated from 3-12 national polls. The index takes values from 0 »very corrupt« to 10 »very clean«. It is thus scaled reversely of the way the index is used in casual discussion. When corruption increases, the κ-index decreases. The standard deviation of the polls for each country is also given. It is typically a little larger than 1, so while the large pattern is very significant, differences of 1-2 points between countries may be random.

I want to stress that this article is no treatise on the sociology of religion, neither does it deal with theology. The main purpose is to demonstrate empirical connections, not to speculate on the reasons why they exist. The problem for such speculations is that religions differ in many and subtle ways, so it is hard to point to the relevant ones.

The statistical analysis is done by means of a simple economic corruption model from Paldam (1999). To this model a set of 12 religion-variables is added. It is shown that several of the religions have highly significant effects - some positive and some negative. In addition to the effects of the individual religions, the effect of *religious diversity* is also analyzed. It is done by including the Herfindahl-index calculated on the religion shares.

The article proceeds as follows: Section I gives the set-up of the study and surveys previous findings. Section II gives a brief survey of the literature. The data used for the cross-country distribution of religions are discussed in Section III, and documented in Appendix (see netsources). The statistical analysis follows in Sections IV to VI, where IV presents methods, while the univariate results are discussed in V, and VI brings some multivariate analysis. The results are briefly discussed and summarized in Section VII.

I Finding an analyzable piece of a grand picture

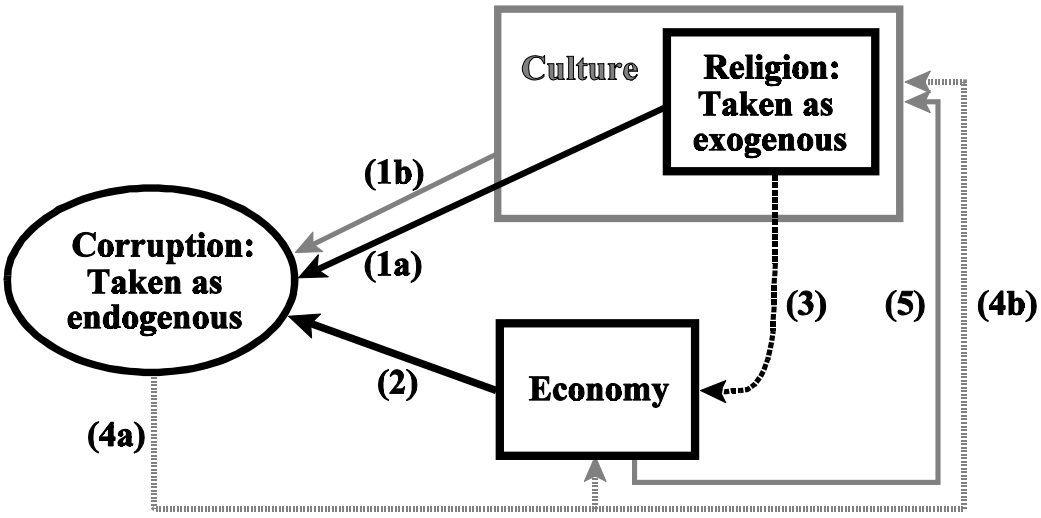
The relations between economic development, culture, religion and corruption are surely complex, involving »grand historical dynamics«, far exceeding the possibilities of »normal« empirical research. It might seem fool-hearted even to try such a pedestrian approach.

The purpose of Subsection I.1 is to argue that a piece of the grand pattern can be isolated and submitted to the standard »hard« tools of analysis, while I.2 briefly considers how religious diversity might matter. Subsection I.3 presents the economic model used.

I.1 Set-up of the analysis

Figure 1 shows a bigger picture of the relations between the concepts studied. The picture is drawn in two colors: Black is used for the operationalized and analyzed parts, while grey is used for the excluded parts. Note the grey box for the broader aspects of »culture« around the black box of religion, for which data have been collected. The boxes are connected by arrows indicating (possible) causal links:

Figure 1. The framework of the analysis



Note: Black indicates concepts, for which variables are defined and causal links analyzed. The broken black arrow is a causal link that is discussed, but not estimated. Grey indicates excluded variables and causal links.

(1a) The »simple« *direct* link from religion to corruption. It is the main link analyzed below.

(1b) Other aspects of culture - unrelated to religion - might influence corruption as well. An attempt to analyze all of (1) - that is (1a) & (1b) jointly - is discussed in Subsection I.3.

(2) The economic link is discussed in the following subsection.

(3) The *Weber-link* is discussed in I.5. In cross-sections this connection is strong. This is a causal link where »grand dynamics« (see below) is heavily involved. (3) generates an *indirect* link from religion to corruption via the economy. The indirect link is much harder to estimate than the direct one, even when the indirect link might be the strongest of the two in the long run.

(4a) The counter-causality link from corruption to the economy. It is assumed to work via the growth rate. As discussed in Subsections I.3 and 4, it has proven weak and fragile. However, to the extent this link exists, it gives a bias in our relations, causing the economic model to be too good. Consequently, it is unlikely to cause an upward bias in (1a).

(4b) The counter-causality link from corruption to religion is assessed to be weak too, except perhaps as a part of the »grand dynamics«.

(5) In the longer run the economic transition from a poor stagnant LDC to a rich modern DC changes »everything« such as educational levels and family patterns. This surely has deep impacts on religion as well.[2)] Once more, this is a field where »grand dynamics« are involved.

2. Theocratic political systems disappear, »pagan superstition« vanishes, while agnosticism and atheism become more widespread. This part of the change is hidden in the statistics. Consider the following two groups: (i) »Indigenous« farmers in Guatemala, and (ii) Parisians. Most members of both groups are classified as Catholics. If asked, they will agree, so in an important sense it is true; but the »religions« of the two groups are surely rather different.

The list of links above distinguishes between »simple« links that can be analyzed in a static cross-country analysis and »grand dynamics« links. They are parts of interrelated historical processes, where »everything« influences everything else over centuries. Such links have the following characteristics: (i) They are important in the long run, but (ii) give small or unstable short-run coefficients. (iii) They are clouded in a great deal of simultaneity and confluence.

Below the »grand dynamics« is covered by one »catchall« variable - y - the GDP-level. It is surely a simple solution to a complex problem, but it has two advantages: In the estimates y proves to be - by far - the most powerful variable.[3)]

I.2 Religious diversity: Competition or collusion?

From the data giving the share of each religion in the 78 countries, it is easy to calculate the Herfindahl index, h_i, for religious diversity, using the formula given in Table 3 (below). The index is a number $0 < h_i < 1$, where h_i goes to 1 as one religion becomes more and more dominating.

The h-variable permits an analysis of the following question: How does religious diversity enter into this picture? Are countries with much religious diversity more or less corrupt than more homogenous ones? Ie, is the effect $\eta = \partial\kappa_i/\partial h_i$ positive or negative?

The scaling of the two variables should be kept in mind: If more diversity ($h\downarrow$) causes less corruption ($\kappa\uparrow$) the sign is negative ($\eta<0$), and if more homogeneity ($h\uparrow$) causes less corruption ($\kappa\uparrow$) the sign is positive ($\eta>0$). On the face of it both signs appear possible:

Good competition ($\eta<0$): For the economist it is a natural thought that religious competition makes0 the individual religions behave as well as possible. So there will be less corruption the more the diversity. The closer to monopoly, the more likely is collusion and corruption.

Dynamic group collusion ($\eta>0$): The alternative hypothesis is that the groups collude and try to help insiders at the expense of outsiders, also by corrupt means. As corruption is a contagious social ill group corruption might lead to other types of corruption as well.

No study appears to have been made of this matter, though many relevant arguments have been made (see Klitgaard (1988, 62-74) and Rose-Ackerman (1999, 130-137) supporting both sides. Fortunately the data speaks decisively on the matter. They support the competition view as discussed in VI.5.

I.3 An empirical corruption model

Table 2 shows a mixed economic-cultural corruption model from Paldam (1999). Below only the economic part of the model is used, while the cultural variables are replaced by the religious ones.

The *pure economic model* is thus: $\kappa = \alpha_1 y_i + \alpha_2 p_i + \alpha_3 \phi_i$. This simple model has remarkable explanatory power, as $R^2 = 0.68$ (see column (1) of Tables 6 and 9). The diagnostic tests indicate only one problem: there is a clear non-linearity, as a NW-European group of rich countries has low corruption. This problem will be further discussed (see Subsection IV.2) as the »NW-block« problem.

3. Secondly, it is probably also a cautious approach: It rather over- than underestimates the influence of the grand dynamics. Conversely it rather under- than overestimates the effects of religion.

y_i, represents the economic transition from a poor stagnant LDC to a rich DC. As a part of that big process, corruption falls dramatically. It is thus our catchall variable as regards the grand dynamics. This is by far the strongest and most robust variable of the model.

p_i, inflation is one of the best indicators of economic mismanagement and chaos. Such problems are rather demoralizing, causing corruption to rise. The effect is often quite strong, but the size of the effect is not as robust as the one of y.

ϕ_i, the economic freedom index is an attempt to measure the amount of regulation and hereby the potential for rent-seeking. A high level of regulation tends to cause corruption to be high too, but the effect lacks robustness - it fails in the estimates presented below. But in view of the literature (see Section III) it has been kept.

Table 2. The economic-cultural model

$\kappa_i = \alpha_0 + []_e + []_c$. The mixed model, where κ is the corruption index and c is a constant, and i is the country index
$\kappa_i = []_e = \alpha_1 y_i + \alpha_2 p_i + \alpha_3 \phi_i$, is the economic model y_i, the (natural) logarithm to real GDP per capita in 1995, using the PPP-data. Source: IBRD data (1997, 1999) p_i, the (natural) logarithm to the average rate of inflation 1991-1995. Source: IBRD data (1997, 1999) ϕ_i, the economic freedom index - averaged 1980-95. Source Gwartney & Lawson (1998, 1999)
$\kappa_i = []_c = \beta_1 D^{WE}_i + \beta_2 D^{LA}_i + \beta_3 D^{OC}_i + \beta_4 D^{A}_i + \beta_5 D^{O}_i + \beta_6 \gamma_i$, is the cultural-political model, where the D's are a set of simple binary dummies for the main »cultural areas«. They are 1 if the country belongs to area, else 0 D^{WE}_i, West European cultural area, including USA, Canada, Australia and New Zealand D^{LA}_i, Latin American cultural area: Spanish/Portugese speaking countries in the Americas south of the USA D^{OE}_i, Old Communist countries. The countries of former USSR and in Eastern and Central Europe D^{A}_i, African Cultural area: Countries in Sub-Sahara Africa D^{O}_i, Oriental Cultural area: Countries with »Chinese« culture including Japan and South Korea γ_i, the Gastil index for democracy. Source: Freedom House.

Below various estimates of this model - alone and with various combinations of the religion variables - will be presented. In addition to these variables Paldam (1999) analyzes the effect of the growth rate. It is taken to be an effect from corruption to growth. It is found to be smaller and less robust than the three effects listed.

The *pure cultural model* $\kappa_i = \beta_1 D^{WE}_i + \beta_2 D^{LA}_i + \beta_3 D^{OC}_i + \beta_4 D^{A}_i + \beta_5 D^{O}_i$, has almost a much explanatory power ($R^2 = 0.65$) as the pure economic model, but the cultural variables used are primitive and have various problems.[4)]

When the mixed model is estimated, it appears that the cultural variables explain much the same variation in the κ-index as the y-variable does. Countries within the same cultural area have relatively

4. The main problem is that some countries are hard to place. The most dubious ones are put in a residual group. Also, some cultural areas as the Arab and the Indian ones are not included, due to lack of data. It should also be mentioned that the democracy index, γ shows a clear positive connection so that more democracy gives less corruption. However, this effect is dubious. It disappears, when y is included in the relation.

less variation in their GDP-levels (as defined by the y-variable) than in their corruption levels. So apparently the cultural area variables work as proxies for the GDP-level and not as proxies for »culture« as such.

II Notes on the literature

During the last decade corruption data have become available, but the bult of the literature is still theoretical. Subsection II.1 introduces the theoretical literature, while II.2 & II.3 look at the new empirical research. Subsection II.4 considers the Weber-link.

II.1 From theory to the κ-index

The literature on corruption is large. Recent surveys are Bardham (1997) and Mbaku (1998). Much material is also found in two recent books: Elliot (1997) and Jain (1998).

The bulk of the literature is theoretical. It uses three approaches: One starts from the standard micro-models of non-benevolent bureaucracy (see Schleifer & Vishny, 1993, 1998). The second uses the law-and-economics framework (see Rose-Ackerman, 1978, 1999). The third relates to the theory of organization (see Klitgaard,1988), who also shows how corruption can develop into full scale »cleptocracy«.[5)] This literature builds on (more or less explicitly) case-studies. However, some research - as Alam (1998) - makes so systematic use of »anecdotes« as to illustrate that »the plural of anecdotes is data«.[6)]

During the last decade survey-data for many countries of the national level of corruption have started to appear. These data have the country as the unit of registration. The κ-index is a compilation and calibration of the main surveys. It will take some time before systematic time-series evidence is available, so the dynamics of the pattern is still largely outside the realm of empirical analysis. The new data has already been used in two types of analyses - surveyed by Jain (1998) and Lambsdorff (1998) - covering the two causal directions:

II.2 The effects of corruption on other variables

This literature concentrates on the effect of corruption on the real growth rate. The pioneering study is Mauro (1995). He studies the effect of corruption on growth via the investment channel. The investment-growth-link is known to be strong and robust,[7)] but investments are notoriously hard to predict in a time-series framework.

However, Mauro (1995), Borner et al (1995), Keefer & Knack (1995, 1998) and IBRD (1997) have shown that socio-political variables constructed from polls predict the cross-country pattern of investment reasonably well. Key variables in these models are measures of: (1) the security of property

5. Klitgaard (1990) describe cleptocracy, see also the essays on Zaïre by Naipaul (1980) and Harden (1992).
6. The idea of Alam (working with Pakistan) is to collect stories on corruption systematically from newspapers. It is a much underrated source by social scientists - especially economists.
7. This is surely the prediction of all theories of growth. It has been reconfirmed, eg, by Barro (1991, 1997) and Levine & Renelt (1992).

rights, (2) the predictability and transparency of government regulation, (3) the reliability of the legal system, and (4) the level of corruption. Their power is approximately in the order given.

Corruption is thus the weakest member of the group. Predictable corruption with moderate rates appears a fairly harmless phenomenon, as regards investment. Only large and arbitrary corruption is a serious problem. When the reduced form estimate of the effect of corruption on growth is analyzed, it is hence no wonder that it found to be small and fragile.

II.3 The effect of other variables on corruption

This is the *corruption-function approach* used at present. Here the literature is meager: Most studies are partial only: Ades & di Tella (1995, 1996) and IBRD (1997), look at the effects on corruption of measures for the contestability of markets. These measures prove to be negatively correlated to the level of corruption. It reduces corruption if the market is open for foreign competition, and if contracts are made more transparent. These findings all suggest a positive connection between the rent-seeking potential in the economy and the amount of corruption. Mauro (1997) looks at the effect of different types of public spending on corruption, and finds a number of minor effects.

Only a couple of studies try a more comprehensive approach: Apart from my own study, already discussed, I have found only Husted (1998). He uses a mixture of economic and cultural variables. The cultural variables are taken from Hofstede's (1984) classification of cultures. He (also) finds a strong effect of the GDP-level. And, some of the cultural traits become significant: notably »power distance«, »masculinity« and »uncertainty avoidance«. These findings are both interesting and puzzling, as it is unclear how operational and exogenous the variables are. Clearly a major effort is needed before these matters are well understood.

II.4 Other research (2): the Weber-link from religion to the economy

The connection from religion to economic development has been discussed in a small literature started by Max Weber (1905-6). The ideas were further developed in Tawney (1926). Since then they have kept reappearing, but they have remained unintegrated in mainstream growth and development theory.

The main idea is that certain religions - notably the more puritan strands of Protestantism - place moral value in thrift, hard work and investment, condemning idleness and consumption. Such attitudes are obviously good for investment and growth. It has been demonstrated that groups with these attitudes have often been over-represented in regions starting a growth process, and in the first wave of entrepreneurs, starting growth processes. Several authors - notably Deepak Lal (1998) - have tried to develop a more general theory covering the growth potential of all big cultures and religions.

The main reason why this literature has remained unintegrated, is its inoperational character. The points are plausible, and illustrated by many stories and anecdotes, but little systematic evidence of the usual type is provided, and no obvious policy conclusions emerge from the theory. So a big gap remains between Weber's theory and standard growth theory. This article cannot bridge the gap, though perhaps it will be reduced by a mite.

III The data-set for religion and religious diversity

Much data exist on religion, but the primary data have to be converted to religion-variables, which are operational relative to the models analyzed. A main problem is here that the numerous religions, denominations and sects must be reduced to a small number of religion »groups«. The groups are termed G-religions, where the G serves as a reminder that »something has been done« to the data.

Table 3 defines the religion variables used: The **r**-matrix gives the shares of 11 groups of religions relative to the population of each country, and the **h**-vector is the Herfindahl-index for religious diversity.[8)] Subsections III.1 & 2 show the construction of the **r**-matrix: III.1 discusses the minimum information criteria necessary for a religion to be included, while III.2 looks at the resulting 11 G-religions included. The **r**-matrix is given in an Appendix (see netsources). Finally, Subsection III.3 takes a first look at the structure of the data found.

Table 3. The two religion variables

	Size	Definition: In matrices the rows are countries and the columns are G-religions
r	78*x*11	Element r^j_i is the fraction of country i's population having the J-religion
h	78*x*1	Element h_i is the Herfindahl-index for religious diversity: $h_i = \Sigma_j r^j_i{}^2$
i	Country index, i = 1, ..., 78	
j	Index for G-religion, j = 1, ..., 11, where j = 11 is the residual	

III.1 The demand for information: Size and broadness

To tally with the κ-index the unit of registration is a country. China and Mauritius are thus equally important information-wise.

There are probably more than 1000 clearly different *religions, denominations and sects* in the world. Most of these religions provide too little information to be usable in our analysis. Our main source is Barrett (1982). It has data for 16 religions (G-religions), and many detailed notes. Some countries have broken up in the meantime. The data have therefore been supplemented with new, but less detailed, information from Britannica Encyclopedia and Hunter (1996). Therefore, the first **r**-matrix had16 columns. Most columns covered groups of religions. However, to be useful in a statistical analysis the matrix has to be reduced to even fewer religions.

To be *statistically useable* a religion (or group of religions) should be *large* in some countries and *broad* in the sense of distributed over more countries. These principles lead to three information criteria listed in Table 4: $(k_1, k_2, k_3) = (2, 5, 0.05)$. Data-series which do not fulfil the criteria will be termed »thin«. Even thin data can produce significant coefficients, but then one should be cautious with the interpretation. That is, the criteria are not taken as absolute, but rather as warning lights. Their

8. Note that the **h**-vector is calculated from the **r**-matrix. The **r**-matrix is reached after a grouping of the religions. With less grouping lower h-values would emerge. That is, while the h's reach make sense relatively, they underestimate the diversity in many countries.

values were chosen after some experiments.

Table 4. The three information criteria: k_1, k_2, k_3

Size: The sum of the r's in a religion-column in the **r**-matrix is larger than $k_1 = 2$
Broadness: More than $k_2 = 5$ of the r's in a religion-column in the **r**-matrix are larger than $k_3 = 0.05$

These criteria rule out the great majority of religions. They merge all »tribal« religions to one, and rule out sects that are widespread, but have remained relatively small in all countries.

III.2 A simple operational classification leading to 11 G-religions.

The criteria reduce the number of religions to 11 in four groups:

A: Monotheistic religions originating in the Middle East. That is, Judaism (where the information criteria fail), Christianity and Islam. These religions have the great advantage (relative to this study) that they are exclusive. They demand that their members belong to no other religion.

B: Polytheistic religions originating on the Indian Subcontinent. That is Hinduism and (partly) Buddhism. These religions have a propensity to mix, but they are still reasonably exclusive.

C: Systems of belief originating in the Far East. That is Confucianism, Shintoism, etc. and (partly) Buddhism. These systems may be seen as a mixture of »old folk« religions and »philosophy«. So they are inclusive. It is common to belong to several at the same time, in a relaxed way.

D: In addition there are some, who belong to other religions (notable tribal religions) or no religion,[9] so a residual column was added.

Thanks to their mixing and inclusive character groups B and C are difficult to handle statistically. Note that Buddhism exists in several forms - some belonging to group B and some to group C. However, Buddhism is treated as one religion.

Christianity is the largest and most widespread religion in the data. But Christians are divided in many denominations and sects. Our solution is to treat Christianity as one »meta-religion«, divided into two large groups, which are further subdivided in four G-religions:

Pre-Reform Christians:

C1: *Old Christians* are churches, who were formed »before« the Catholic Church was established as »Roman«. It included Eastern/Orthodox groups as Coptic, Greek, Serb, Russian etc.

C2: *Catholics*: The Roman Catholic Church.

Reform Christians:

C3: *Protestants* are churches formed after the Reformation, including some new denominations and

9. The division line between the main religion and atheism is highly susceptible to politics. There is probably little difference between the fraction of devout Catholics in Uruguay, Argentina and Chile, but there are vastly more reported atheists in Uruguay, for well-known historical reasons. In the same way Sweden report more atheists than Norway and Denmark. The old and present communist countries also report large shares of atheists.

sects, which are rather different.[10)]

C4: There are just about enough Anglicans so that they can be analyzed separately.

Islam is less divided, even when the Sunni and Shia denominations are different, and a number of small »new« sects exist. However, the data do not allow a full separation of Sunni and Shia Muslims, and most of the new sects of Islam and Christianity are merged as »new syncretist« religions. They have been placed in the residual group. So Islam is one religion only.

Hinduism (including Shiks and Jains) provided the worst problem statistically, as the data contained only two countries (India and Mauritius) with a large r^j_i-value and a couple with 2-10%. Other countries with large shares of Hindu population (as Nepal and Guyana) are not covered by the κ-index. So, in spite of the fact that about 800 mill people belong to the Hindu religion, it just did not pass the information criteria. It was analyzed anyhow, but it did not produce significant coefficients.

However, there are enough data to analyze Buddhism as a separate religion. Also, there are enough data for tribal religions - mainly in Africa - to produce a data-series. Finally, the indigenous religions of China, Japan and Korea have been merged into one (inclusive) Oriental religion. That leaves a column of Atheists and a residual column, making all rows sum to 1.

This gives a total of 11 columns in the **r**-matrix: (1*) Old Christian, (2) Catholic, (3*) Anglican, (4) Protestant, (5) Muslim, (6**) Hindu, (7) Buddhism, (8) Oriental, (9*) Tribal, (10) Atheists and (11) Residual. The *'s indicate thin series (see Table 5). The first four variables add to (1-4) Christians, while all 11 add to 1, in every row. The 11 groups are thus the *G-religions* - most are, in fact, groups of religions.

III.3 The structure of the religion variables

The **r**-matrix reached is given in the Appendix. From the **r**-matrix it is easy to calculate the **h**-vector giving the Herfindahl index for the amount of religious »concentration/diversity«, by the formula given in Table 3. The **h**-data are also shown in the Appendix. Table 5 (overleaf) gives a few statistics summarizing the religion data.

The Weber-link is illustrated by by row (5) and (6) of the table. They give an *approximate average income* of the group-members. It appears that the differences are large. The main problem for the Weber interpretation is that the relations must have looked rather differently only 3 centuries ago.

Finally, it should be mentioned that the average value of the Herfindahl index is 0.604 - indicating a high level of religious concentration. Table 5 shows that one $r^j > 0.5$ in 56 of the 78 countries.

IV Techniques and main regressions

In order to statistically prove and graphically display the results, some techniques are necessary. The present section documents 55 regressions and presents a simple graphical technique - termed the SR-graph - that is used for presenting the main results. The results are discussed in section V.

10. It includes the two groups from Barrett: »Protestants« and »Marginal Protestants«.

Table 5. The structure of the **r**-data measuring the religion of the 78 countries

Religion	Number of countries		Size		Average income [a)]	
	(1) Above 0.5	(2) Above 0.05	(3) Column Σ	(4) In mill	(5) Unweighted	(6) Weighted
Christian:	54	67	46.99	1681	10311	13073
Old Chr.	2	6	2.65	84	7847	7333
Catholic	28	52	30.46	942	8950	10455
Anglicans	0	9	1.92	57	11362	12737
Protestant	6	32	11.96	598	14336	18506
Islam	7	22	10.12	658	4431	3197
Hindu	1	4	1.51	809	6699	1471
Buddhism	2	8	2.32	232	13471	10840
Oriental	3	8	2.84	397	14649	5476
Tribal	0	12	3.22	80	2557	2257
Atheists	6	26	7.07	1171	9464	4647
Residual	1	20	3.90	148	4565	1782

Note: Columns (4) and (5) uses the population sizes, while the other columns disregard country size. The calculations in (5) & (6) are based on the false assumption that all adherents of each religion have the same (average) income in each country. More precise data would surely increase the differences found.

a. Measured in PPP values relative to the GDP per capita in the median income country of the sample.

IV.1 Fifty five regressions

Tables 6 to 8 list the main results of a total of 55 regressions. The tables have 5 rows and a total of 19 columns. The top row contains numbers and headlines. The next three rows give estimates of three models - Model 1, 2 and 3. The bottom row gives the R^2-ratio and one test - both for Models 2.

Model 1:	$\kappa_i = \beta_0 + \beta_1 r^j_i + u_{1i}$	pure J-religion model
Model 2a:	$\kappa_i = \alpha_0 + \alpha_1 y_i + \alpha_2 p_i + \alpha_3 \phi_i + u_{2i}$	pure economic model
Model 2b:	$\kappa_i = \gamma_0 + \gamma_1 y_i + \gamma_2 p_i + \gamma_3 \phi_i + \gamma_4 r^j_i + u_{3i}$	mixed model
Model 3:	$u_{2i} = \delta_0 + \delta_1 r^j_i + u_{4i}$	estimate of link (1a) from Figure1

The three models use the following variables: r^j is column j in the **r**-matrix, ie, it is the data-set for a G-religion, y is the logarithm to average real GDP per capita, p is logarithm to the average rate of inflation, ϕ is the economic freedom index (see also Table 2). The u's are the residuals.

Column (1) in Table 6 gives the estimate of the pure economic model. No religion is included in this column, so Model 2a is estimated. In columns (2) to (19) all three models are estimated. Model 3 is the second stage of a two-step procedure, where the first step is always the estimate of Model 2a given in column (1). For Models (1) and (3) the constants are not given, to concentrate the table on essentials.

Table 6. Regressions for the largest G-religions

	(1) Economy	(2) Christians	(3) Muslim	(4) Hindu	(5) Buddhist	(6) Orient	(7) Tribal
Model 1							
Religion alone		1.50 (2.0)	-2.23 (2.3)	-1.64 (0.6)	-0.47 (0.2)	2.16 (0.9)	-5.19 (2.0)
Model 2							
Constant	-8.31 (4.2)	-7.87 (4.0)	-7.12 (3.3)	-8.20 (4.1)	-8.38 (4.4)	-8.51 (4.3)	-10.70 (4.8)
y (log gdp)	1.72 (8.3)	1.65 (7.6)	1.63 (7.4)	1.71 (8.1)	1.72 (8.6)	1.72 (8.3)	1.94 (8.5)
p (log inf)	-0.40 (2.9)	-0.43 (3.1)	-0.45 (3.2)	-0.40 (2.8)	-0.43 (3.2)	-0.40 (2.9)	-0.33 (2.4)
ϕ (ec. free)	-0.16 (1.1)	-0.16 (1.1)	-0.18 (1.1)	-0.16 (1.1)	-0.10 (0.7)	-0.11 (0.7)	-0.13 (0.9)
Religion		0.53 (1.2)	-0.79 (1.3)	-0.44 (0.3)	-3.24 (2.6)	-1.38 (0.9)	3.75 (2.1)
Model 3							
Religion/res.		0.48 (1.1)	-0.66 (1.2)	-0.43 (0.3)	-3.02 (2.5)	-1.12 (0.8)	2.74 (1.8)
R^2	0.68	0.68	0.68	0.68	0.70	0.68	0.70
Reset (p %)	0.01	0.01	0.03	0.01	0.00	0.01	0.02

To discuss the logic of Tables 6 to 8, the reader should revisit Figure 1. Model 1 gives »all chances« to the J-religion to explain everything it can - by both *the direct link* (1a) and *the indirect link* (3 - 2). Model 3 is the reverse extreme as all effects of *the indirect link* is taken out in the Step 1 regression. Model 2 is an intermediary model, where the two links are allowed to compete.

Table 7. Four Christian denominations: the big divide

	Pre-Reform			Reform		
	(8) Old	(9) Catholic	(10) (8)+(9)	(11) Protestant	(12) Anglicans	(13) (11)+(12)
Model 1						
Religion alone	-1.33 (0.7)	-1.02 (1.4)	-1.21 (1.7)	5.17 (6.5)	7.84 (1.9)	5.65 (6.7)
Model 2						
Constant	-8.50 (3.3)	-8.78 (4.6)	-9.20 (4.8)	-7.93 (5.0)	-8.86 (4.7)	-8.27 (5.4)
y (log gdp)	1.75 (7.4)	1.76 (8.6)	1.81 (8.9)	1.49 (8.6)	1.74 (8.7)	1.51 (9.1)
p (log inf)	-0.38 (3.2)	-0.32 (2.3)	-0.27 (1.9)	-0.24 (2.1)	-0.35 (2.6)	-0.21 (1.9)
ϕ (ec. free)	-0.17 (1.3)	-0.10 (0.7)	-0.10 (0.7)	-0.01 (0.1)	-0.14 (1.0)	-0.01 (0.1)
Religion	-0.69 (0.5)	-0.94 (2.2)	-1.11 (2.5)	3.65 (6.2)	5.97 (2.6)	3.59 (6.9)
Model 3						
Religion/res.	-0.59 (0.5)	-0.86 (2.2)	-0.96 (2.4)	3.09 (5.6)	5.81 (2.6)	3.04 (6.1)
R^2	0.68	0.70	0.70	0.79	0.70	0.80
Reset	0.01	0.01	0.01	0.29	0.01	1.0

Table 8. Regressions for other groups and for the Herfindahl index

	Hinduism (4), Buddhism (5) & Orient (6)			Last two groups		PS
	(14) (4)+(5)	(15) (5)+(6)	(16) (4)+(5)+(6)	(17) Atheists	(18) Residual	(19) Herfindahl
Model 1						
Religion alone	-0.96 (0.6)	0.56 (0.4)	0.07 (0.1)	0.53 (0.3)	0.33 (0.1)	-0.69 (0.7)
Model 2						
Constant	-7.88 (4.1)	-8.66 (4.5)	-8.23 (4.3)	-8.15 (4.0)	-8.48 (4.3)	-8.01 (4.3)
y (log gdp)	1.67 (8.2)	1.72 (8.5)	1.69 (8.3)	1.70 (7.8)	1.72 (8.3)	1.82 (8.9)
p (log inf)	-0.44 (3.3)	-0.41 (3.1)	-0.43 (3.2)	-0.41 (2.8)	-0.40 (2.9)	-0.38 (2.9)
ϕ (ec. free)	-0.12 (0.8)	-0.04 (0.3)	-0.06 (0.4)	-0.16 (1.1)	-0.13 (0.9)	-0.22 (1.5)
Religion	-2.14 (2.2)	-1.99 (2.3)	-1.62 (2.1)	0.31 (0.3)	1.55 (1.1)	-1.48 (2.5)
Model 3						
Religion/res.	-2.01 (2.2)	-1.65 (2.1)	-1.39 (2.0)	0.28 (0.3)	1.48 (1.1)	-1.41 (2.5)
R^2	0.70	0.70	0.70	0.68	0.68	0.70
Reset	0.00	0.01	0.00	0.01	0.05	0.09

Note that a great deal of the columns show nothing significant. However, Protestantism and Anglicanism turn out to generate very significant coefficients. Several others are significant as well: Catholicism, Buddhism, etc. Two of the economic variables are stable and consistently significant: y and p. The freedom index, ϕ, never stabilizes.

Most diagnostic tests point to no problems. But one test is consistently problematic: the Reset-test for functional form. It says that the linear functional form used is not perfect. The next section shows how the problem looks.[11)]

IV.2 The curvature problem

Tables 6 to 10 and Paldam (1999) show that the strongest and most robust explanatory variable in our modeling is y (log GDP per capita). Figure 2 (overleaf) shows the scatter-plot for the y-variable at the horizontal axis, and the κ-index at the vertical axis. It is obvious that there is a strong connection.

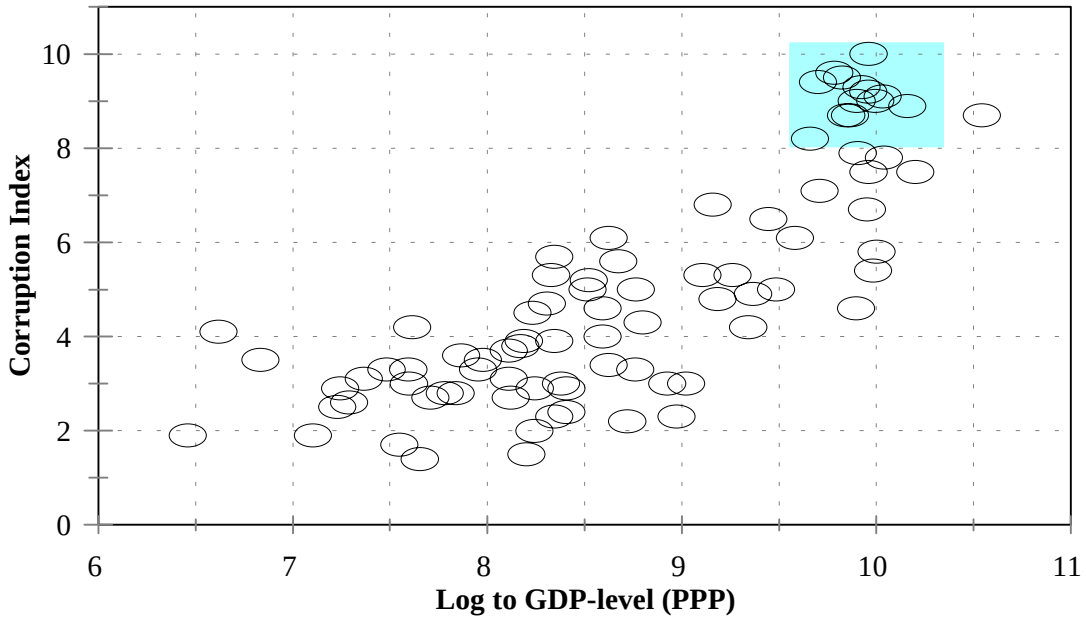
It is also clear why the Reset-test detects a non-linearity. The average curve through the points bends upward. At further examination it proves that the bend is caused by the *block* of observations lying closely together (in the grey box) at the extreme top-right end of the figure. This block is formed by North-West European countries, which are all rich and honest - it will be termed the »NW-block«.

If a NW-European dummy is included the slope to y falls from about 1.75 to 1.5, as the reader may guess from looking at Figure 3 - however all other coefficients stay much the same. And, the Reset-test show that the problem has disappeared. Most countries in the NW-block are Protestants. So the NW-dummy is correlated with the $r^{Protestant}$-series. However, there are also Protestants outside the

11. The model is linear between the κ-index, log GDP per capita, log inflation etc. Experiments were made with other functional forms, but it is far better to show exactly what the problem is.

NW-block. Consequently, the inclusions of the $r^{Protestant}$-series reduces the problem (the Reset-test improves), but it does not make it disappear fully.

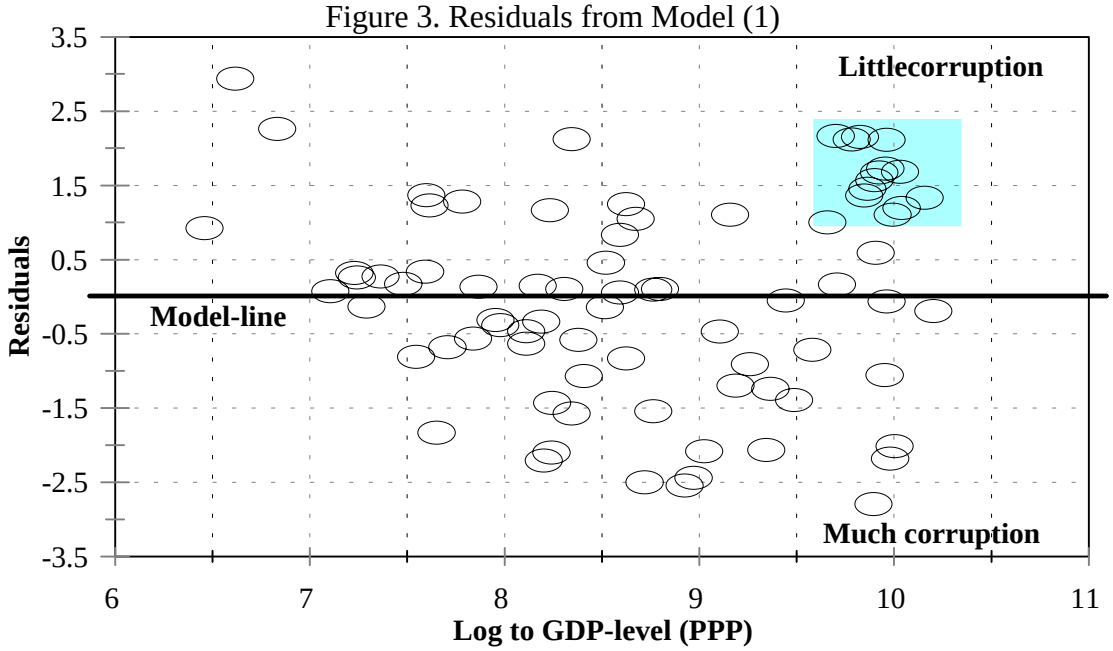
Figure 2. The κ-index »explained« by y (the GDP level)



IV.3 Generating the SR-graphs - ie, the shaded residual graph

The residuals from Model 2a are shown on Figure 3. The points above the model-line (representing the model prediction at each y) show countries with below average corruption (the κ-index is »too big«), and vice versa. The NW-block is in a grey box - it is once more a distinct group.

Figure 3. Residuals from Model (1)



Note: The residuals are scaled by a factor of about 1.5 compared with Figure 2.

Figure 3 is used for calculating the *SR-graph* for different G-religions. It is made simply by shading the residuals (of Figure 3) in different intensity from white to black. The color indicates the density of the G-religion in the country of that particular residual. The SR-graphs are drawn to allow the reader to see - with the naked eye - both the Weber-effect and the corruption-effect of the G-religion. The effects appear as a skewness in the shading:

A **Weber-effect** appears in the left to right (horizontal) dimension. If most of the shading is to right, it indicates that the adherents of the G-religion are relatively wealthy, and vice versa.

A **corruption-effect** appears in the upward-downward (vertical) dimension. If most of the shading is above the model-line, the adherents of the G-religion are relatively honest, and vice versa.

A dozen SR-graphs have been calculated. Figures 4 to 8 are specimens used to illustrate the most interesting results reached in Tables 6 to 8.

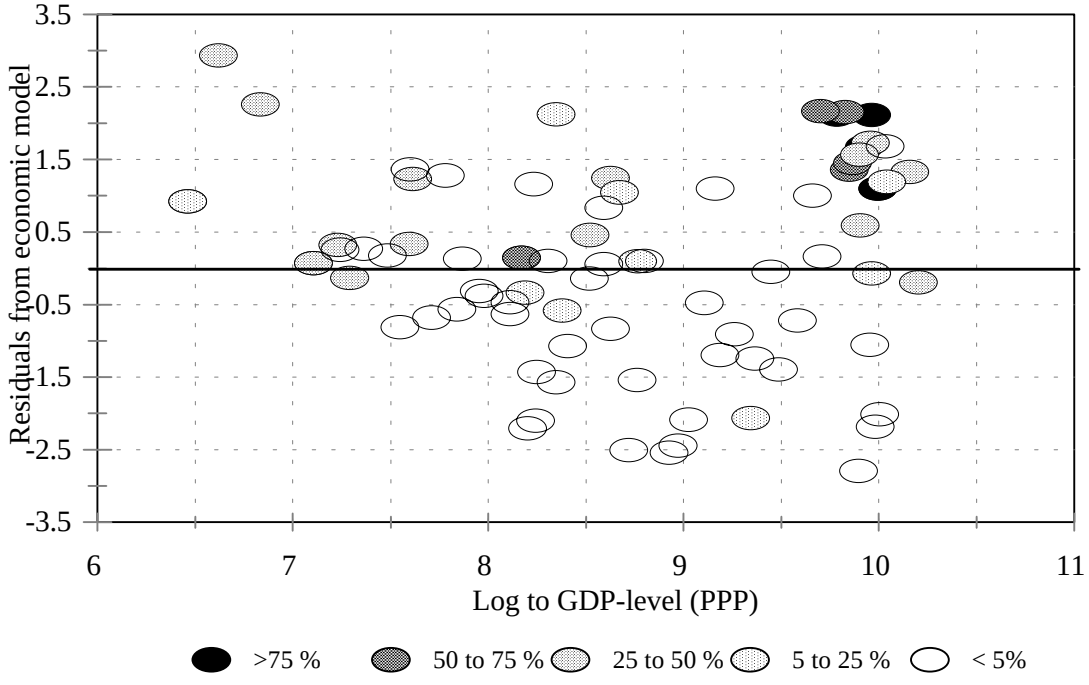
V The univariate results for the religions

After all these preliminaries it is time to look at the results. Subsection V.1 considers the effects of Christianity, while V.2 turns to Islam. The case of Tribal religion is discussed in V.3, and the Asian G-religions are considered V.4. The effect of religious diversity is analyzed in Subsection V.5.

V.1 Christianity: the big divide

Column (2) in Table 6 analyzes the effect of Christianity. All three coefficients to religion in the table show a positive effect of Christianity on corruption, but it is modest and (mostly) insignificant. Christians are thus less corrupt than non-Christians, but not significantly so.

Figure 4. SR-Graph for Reform Christians: Protestants and Anglicans

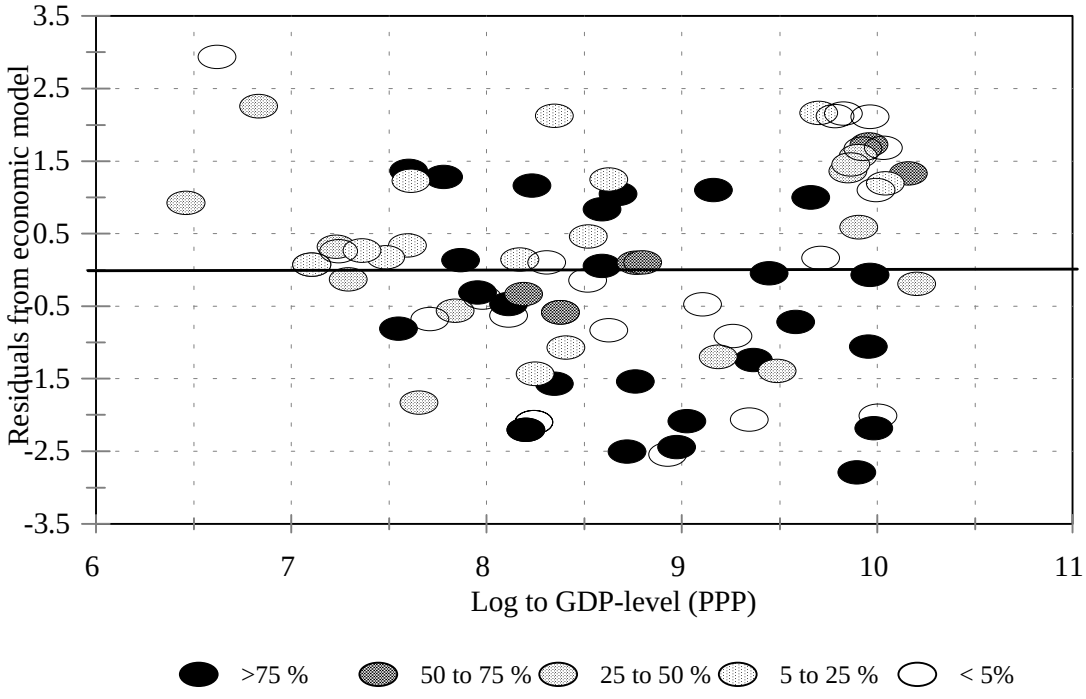


This is a dull result, but when the Christians are divided into 4 groups in Table 7 the result is dramatic. The table shows that »Reform-Christians« (Protestants and Anglicans) are 4 (or more) points less corrupt than Pre-Reform Christians (Catholics and »Old« Christians) at the same level of economic development. Two of the denominations have barely enough observations for the analysis: »Old« and Anglicans - »Old« fails to obtain significance, while Anglican produces unreasonably large coefficients (see below). However, when added to the other denomination with the same sign - as done in columns (10) and (13) - the significance of the coefficient increases.

Both the estimate of about -1 to Pre-Reform Christianity and the estimate of 3 - 3½ to Reform Christianity appears rather solid. This gives a gap of 4 - 4½ points. In other experiments reported below the gap decreases a little, but it stays above 3¼ in all experiments. The corruption-gap between the two groups can thus be assessed to be between 3½ and 4 points on the κ-scale. As the κ-index has a range from 0 to 10 such a difference is large indeed. Needless to say it is highly significant.

Figures 4 and 5 show the SR-graphs for the two groups. Part of the reason why Figure 4 shows such a significant picture is the NW-block in the upper right side of the graph. But, even without that block nearly all points are above the line. This graph should be confronted with Figure 5 showing the Pre-Reform Christians, ie, the Catholics and Old Christians. The difference between the two types of Christians is very visible on the graphs.

Figure 5. SR-Graph for Pre-Reform Christians: Old Christians and Catholics



It should also be added that the Protestantism in columns (11) and (13) shows clear collinearity with the y-variable, indicating that the indirect link is of some importance here. The results thus confirm that Max Weber was right in pointing to the importance of Protestant »ethics«.

One of the key purposes of the Reformation (almost 500 years ago) was precisely to fight the corruption (broadly defined) of the Catholic Church. Historians have pointed to other - more complex -

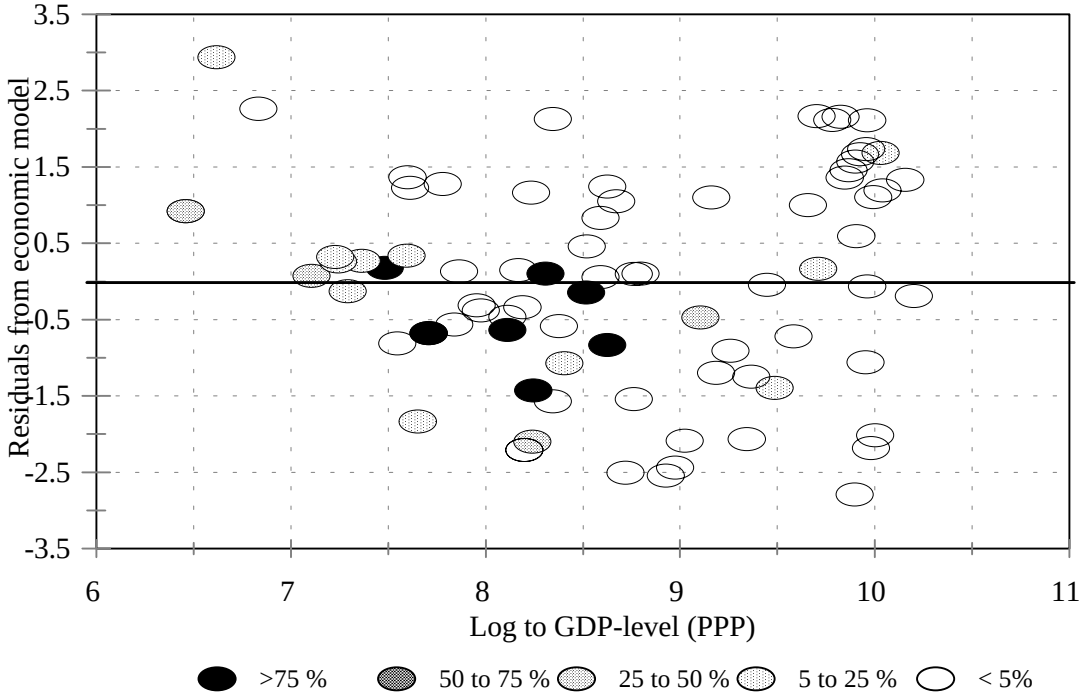
reasons as well, but the moral stand against corruption was surely important.

It is thus arguable that reverse causality entered into the Reformation process. It was the more »moralist«countries, who chose the various »Reformist« denominations, while those more »tolerant« remained with their old denominations. However, this happened very long ago. In the meantime there have been many changes within all denominations - including »moral reforms« also within the Catholic Church. So it is amazing that such a large gap in »ethics« still remains.

V.2 Islam

Column 3 in Table 6 and Figure 6 look at the results for Islam. Here both skewnesses are present. Muslims are poorer and more corrupt than non-Muslims in our data, but the second effect is insignificant. This might be due to data problems.[12)] When Christians and Muslims are compared in columns (2) and (3) of Table 6, there is a difference, but it is only just significant.

Figure 6. SR-Graph for Islam



The country-sample does not include any of the rich Muslim oil-countries from around the »Gulf«. It is easy to guess how they would have effected the results, if data had been available. They got rich from »windfall« gains not from going through the big process of the economic transition. It is consequently a reasonable hypothesis that they have kept the level of corruption of much poorer countries. Casual observation appears to confirm this hypothesis. As a result they would probably have very negative

12. In addition to the problem discussed at the last paragraph, there is also the problem that the data used for Indonesia has only a Muslim share of 0.434. This is because Barrett (1982) classify another 0.355 as »New Religionists« that are put in the Residual group, even when Barrett's notes and other sources term them mostly Muslims. I have preferred to stick to the source.

residuals - maybe below the bottom line of the SR-graph. The non-inclusion of these countries must therefore give an upward bias in the coefficients to Islam.

My conjecture is therefore that if data had been better, Muslims would have a coefficient much like the one of the Pre-Reform Christians. It is shown later that when the two groups are merged, they get a higher joint significance than they have individually.

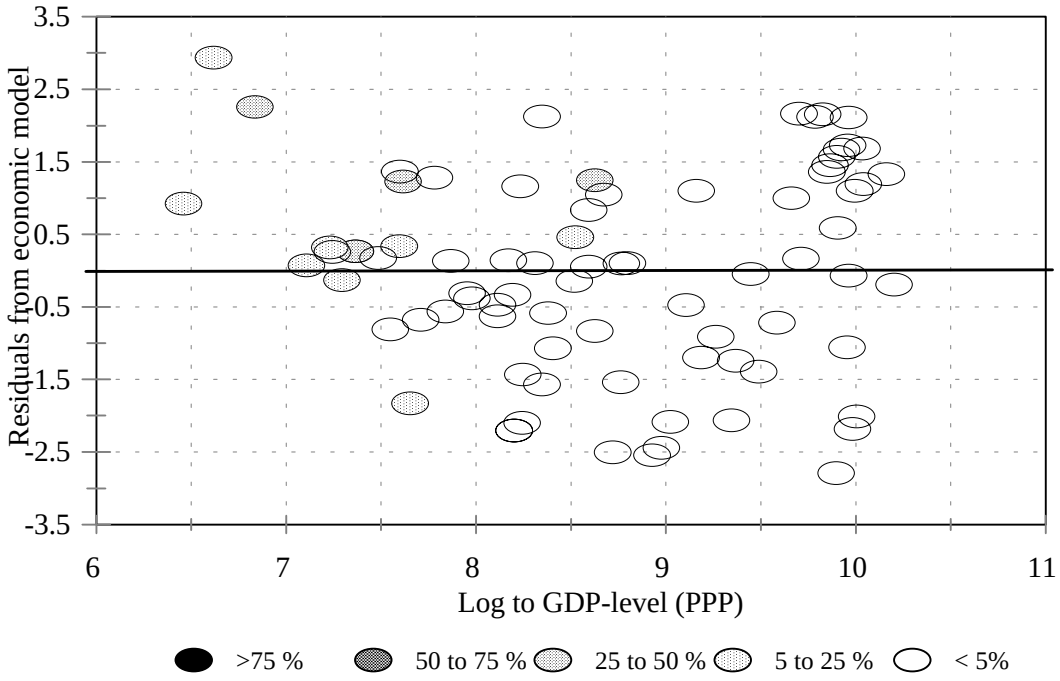
V.3 Tribal religion: virtue in the »original state«?

It is interesting that Tribal religions manage to generate a significantly positive coefficient. The tribal religions are found in the very poorest countries (mainly in Africa) so Model 1 produces a negative coefficient. However, when the wealth of nations is accounted for in Models 2 and 3, the coefficient turns positive, and even reaches significance. What is going on is obvious from Figure 7.

The tribal religions included are numerous and different, so the coefficient says little about any one of those. However, it can be interpreted as a proxy for »the original state«.

It has often been suggested that there was little corruption before the start of the transition process. And, certainly one can see development as a process destroying (stable poor) *traditional society*, turning it into something of a »mess«, before it creates a new stable (rich and slowly growing) *modern society*. One can imagine that corruption increases in the beginning of the process, so that the corruption transition has a ∪-shaped form, where corruption first rises and then falls.

Figure 7. SR-Graph for Tribal religion



One may further argue that the κ-index available for the nations of today lack observations allowing an estimate of the first part of the ∪-shaped transition curve, where κ falls (corruption rises). The large and stable positive coefficient to y (GDP per capita) indicates that κ raises (corruption falls) when

countries go from the »mess« to become rich.[13)]

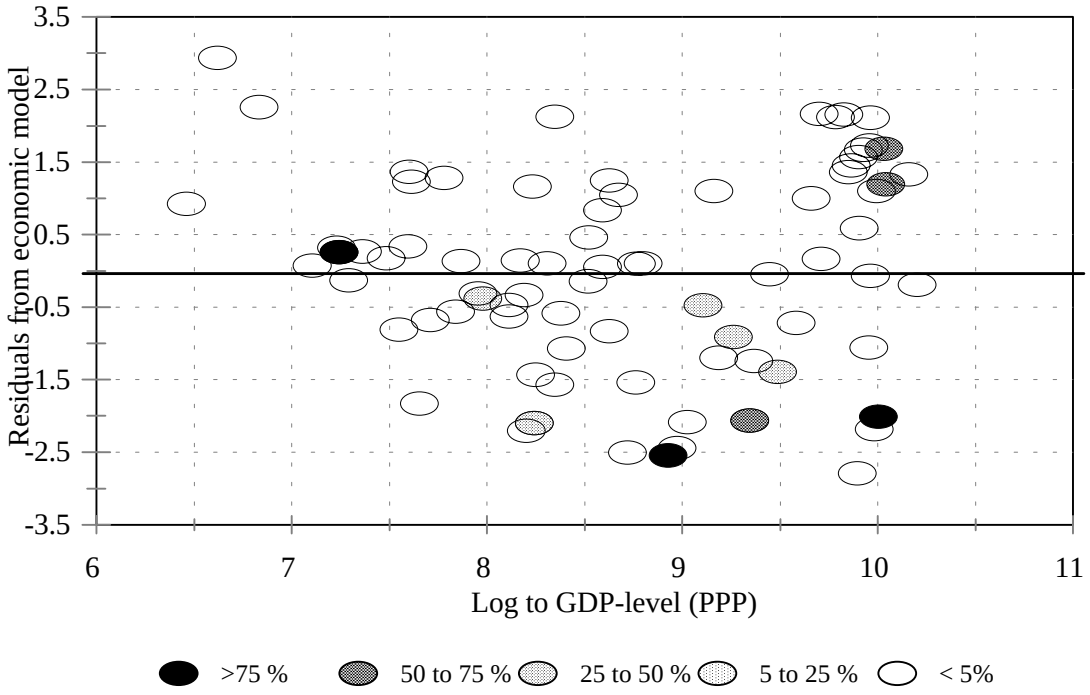
In this perspective one may see the positive coefficient to Tribal religion as an indication of the first part of the transition is negative. The loss of the original tribal religions is indeed associated with a rise in corruption.

V.4 The remaining groups: Hinduism, Buddhism, Oriental, Atheists and the Residual

The results for the three Asiatic religions are all negative, but only the results for Buddhism are significant. However the data - notably for Hinduism - are thin.

Therefore, some experiments were made with a further grouping of the three Asiatic religions. This is done in columns (14), (15) & (16) of Table 8. The results are similar. All groups produce significance. Figure 8 shows the SR-graph for the aggregate of all three G-religions.

Figure 8. SR-Graph for three Asian religions together: Hinduism, Buddhism and Oriental



It is interesting that while the coefficient to the Oriental G-religion (of China, Japan & Korea, etc) is negative, there are a couple of positive residuals for the countries of that group (notably Singapore). It is arguable that corruption is a variable that changes slowly, and that therefore countries as (South) Korea that has grown rich very fast is still in the process of changing in this field.

The last G-religions are the Atheists and the Residual group. They are relatively uncorrupt, but the positive coefficients are insignificant. However, the members of each of these groups are very different, so it would have been puzzling if the data for these G-religions had produced significant

13. It is easy indeed to expand and develop the argument in this subsection and refer to much literature on duality models, social transformation, etc. However, the argument is left as a sketch only - the evidence of the barely significant coefficient to Tribal religion is suggestive and interesting, but it can hardly carry the weight of a major construction.

coefficients.

V.5 The effect of religious concentration/diversity: the Herfindahl index

The Herfindahl index (h) for religious diversity has much the same range as the r^j-series, so it has been treated in the same way, even when it is a very different variable conceptually.

Column (19) in Table 8 shows what happens: A significant negative coefficient is generated: $\eta = \partial\kappa_i/\partial h_i < 0$, so a country with great religious diversity (low h) has less corruption (high κ) than a country with a monopoly religion.

In the next section it appears that the h-variable has considerable collinearity to the r-variables it is calculated from. However, it is negative in each and every regression made, and it »survives« as significant in regressions with one and often two of the r-variables. Therefore the negativity of the coefficient will be treated as a fact, though it is uncertain how large the coefficient is. In assessing the size of the effect it should also be noted that the h-values reached are made higher by construction, when the religions are grouped.

It is often argued that religious homogeneity is a great advantage for a country, as religious diversity may lead to political and social instability and even civil war, but as regards corruption diversity is obviously an advantage.

VI Multivariate results

Three groups of variables have been analyzed: (i) economic variables, (ii) religion-variables, and (iii) the Herfindahl-index for religious diversity. All religions sum to 1 per definition, so they cannot all be included together with a constant, as has been done for each of them. The least significant religions are the ones with adherents closest to average corruption. Four large groups of religions gave significant coefficients in Section IV: (1) Pre-Reform Christians (and Islam), (2) Reform Christians, (3) The three Asian religions combined and (4) Tribal religion. These groups will be used in this Section. Its two subsections report on two sets of experiments: VI.1 deals with experiments with combinations of the three groups of variables, while VI.2 covers experiments with different combinations the individual variables, notably the religion variables.

VI.1 Experiments with the three groups of variables

Table 9 reports estimates of all combinations of the three groups of variables. The first two columns repeat regressions already given. The third column - termed Variant 1 - shows the full model, and then follow other combinations of the groups.

The economic variables - especially y - give the bulk of the explanatory power. The Herfindahl-index is consistently negative, but it has problems with collinearity - especially with the Tribal religions, and is insignificant in most of the regressions when several religions are included.

Table 9. Combining the three groups of variables

	Table 6	Table 8	Variant 1	Variant 2	Variant 3	Variant 4
Pre Reform Chr	**Column (1)**	**Column (19)**	-0.58 (1.2)	-0.65 (1.4)	0.49 (0.7)	0.44 (0.6)
Reform Chr			2.82 (4.3)	2.88 (4.7)	6.26 (6.4)	6.35 (6.7)
Three Asian			-1.17 (1.4)	-1.12 (1.4)	1.45 (1.2)	1.57 (1.4)
Tribal			1.01 (0.6)	1.46 (1.0)	-6.23 (2.5)	-5.72 (2.6)
Herfindahl		-1.48 (2.5)	-0.36 (0.6)		-0.48 (0.5)	
y (log GDP)	1.72 (8.3)	1.82 (8.9)	1.66 (8.6)	1.66 (8.6)		
p (log inf)	-0.40 (2.9)	-0.38 (2.9)	-0.18 (1.5)	-0.16 (1.4)		
ϕ (ec. free.)	-0.16 (1.1)	-0.22 (1.5)	0.06 (0.4)	0.08 (0.6)		
Constant	-8.31 (4.2)	-8.01 (4.3)	-9.29 (4.8)	-9.70 (5.4)	4.05 (4.8)	3.74 (6.7)
R^2	0.68	0.70	0.82	0.81	0.46	0.46
Reset	0.01	0.09	1.1	2.7	28.3	85.5

The Weber-link predicts that the religion variables and economic variables should have some collinearity. Some examples that this is the case have already appeared in Section IV - notably with the Reform Christians. When the economic variables are deleted and the Weber-link has to work alone in Variants 3 and 4 the explanatory power of the model drops dramatically. In addition, it should be noted that all coefficients to the religion variables change significantly when the corresponding models with and without the economic variables are included. The only variable keeping its sign is the one to Reform Christians as per Weber's theory.

Table 10. Experiments with different combinations of variables

	Variant 5	Variant 6	Variant 7	Variant 8	Variant 9	Variant 10
Islam		-0.89 (1.2)	-1.10 (1.8)			
Pre Reform Chr	-0.52 (1.1)					
Reform Chr	2.84 (4.4)	2.39 (2.7)	2.28 (2.7)	3.18 (5.5)	3.19 (5.6)	3.46 (6.6)
Three Asian	-1.14 (1.6)	-1.49 (1.7)	-1.59 (1.8)	-0.66 (1.0)	-0.74 (1.2)	
Tribal				1.01 (0.6)		1.76 (1.2)
Herfindahl	-0.57 (1.1)	-0.30 (0.5)		-0.54 (0.9)	-0.70 (1.4)	
y (log GDP)	1.62 (9.7)	1.55 (9.7)	1.53 (9.9)	1.62 (8.8)	1.56 (9.8)	1.62 (8.9)
p (log inf)	-0.21 (1.9)	-0.26 (2.4)	-0.27 (2.4)	-0.22 (1.9)	-0.23 (2.1)	-0.18 (1.7)
Constant	-8.51 (5.5)	-7.51 (4.7)	-7.38 (4.7)	-8.81 (4.7)	-8.14 (5.4)	-9.41 (5.3)
R^2	0.81	0.81	0.81	0.81	0.81	0.81
Reset	1.5	1.6	4.1	1.1	1.7	5.7

VI.2 Experiments with individual variables

Table 10 starts out from Variant 1 in Table 9, by deleting the least significant variables, then Islam is

added to the Pre-Reform Christians - as previously suggested - and in Variant 7 everything is significant. However, now the Pre-Reform/Islam-group becomes very large.

The difference between the Pre-Reformed Christians (and Muslims) at the one side and the Reform Christians stay remarkably constant around 3.4 in Variants 1, 2, 4, 6 & 7, and the difference is significant at a very high level, even when the coefficient to the largest group is often insignificant.

VII Conclusion

The analysis started from an economic model of corruption. It says that poor countries have a high level of corruption. As they pass through the economic transition to become rich, corruption drops dramatically. Also, the model shows that high inflation increases corruption. The potential for rent seeking, as measured by the economic freedom index, did not work in the model, even when it sometimes does. The economic model explains most of the variation ($R^2 = 0.68$) in the corruption index.

The purpose of the analysis was to show if cultural factors as formed by religious differences can explain the corruption index, either *in addition to* or *instead of* the economic model. The theoretical discussion terms this *the direct* and *the indirect* effect of religion.

The direct effect is the additional effect of religion once the economic model is accounted for. It was found to add about 0.14 points (ie, R^2 increased from 0.68 to 0.82). Two groups of religions decrease corruption - Reform Christianity and Tribal religion - while two other groups of religions increase corruption - Pre-Reform Christianity and Buddhism and related Asian religions. The big divide in the data was thus within Christianity, where a large and highly significant gap appeared between Reform and Pre-Reform denominations. The Reform Christians are Protestants and Anglicans, while the Pre-Reform Christians are Catholics, Orthodox and other »Old« churches. Islam can be added to the Pre-Reform group with no change in the coefficient.

The indirect effect is also termed the Weber-link. It is the effect of the religions on economic development. It is already included in the economic model. Clear signs of this mechanism was found, but it is difficult to estimate from static cross-section data, as it has developed via historical processes. If corruption was an important factor explaining growth, the indirect effect would be a long-run consequence of the direct effect. There is evidence suggesting that a growth link does exists, but it is weak. However, the clearest positive indirect effects were found precisely for the Reform Christians, so perhaps low corruption does contribute to growth in the long run.

The most problematic aspect of the importance of the big Christian divide for corruption is that a historical perspective suggests a strange type of reverse causality. The Reformation almost half a millennium ago was a reaction of the North West Europeans to the moral decay of the Catholic Church at that time. In such a perspective the very existence of the Reform Christians becomes an effect of the different tolerance to corruption of North West Europeans and other Europeans. However, these attitudes have also spread to African countries that have been christened by missionaries from the two sides of the divide.

Another notable result was that religious diversity reduces corruption. This was interpreted as an example of the virtue of competition.

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IBRD Anti-corruption knowledge resource center. Much information available including *An Annotated Bibliography*. No date, but frequently updated. Address: <http://www.worldbank.org/html/extdr/anticorruption>

Internet Center for Corruption Research. A Joint Initiative of Göttingen University and Transparency International. Source for Corruption Index. Address: <http://www.gwdg.de/~uwvw/icr.htm> or <http:/www.transparency.de>

Martin Paldam homepage <http://www.econ.au.dk/vip_htm/mpaldam/homepage.htm>. Links to Paldam (1999) and the data Appendix.

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