

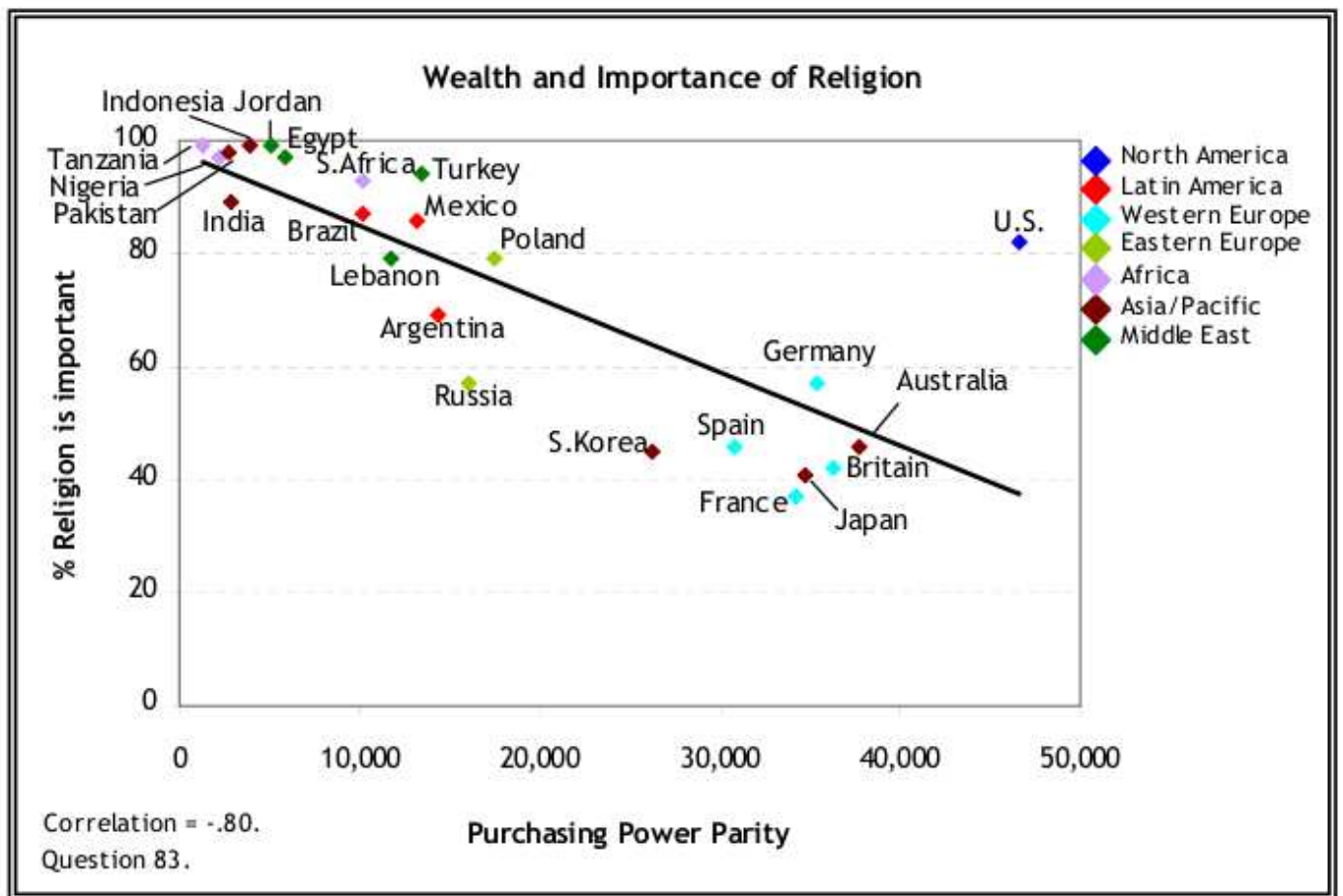
MODEL NUMBER 6
OF A
“PUBLIC AWARENESS ANALYZED EXAMPLE”

JONATHAN A. PORITZ
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COLORADO STATE UNIVERSITY, PUEBLO

WHERE: This is on p. 20 of **Unfavorable Views of Jews and Muslims on the Increase in Europe**, a report from the “Pew Global Attitudes Project”, produced by the Pew Research Center on September 17, 2008. It can also be found online at

<http://pewglobal.org/reports/display.php?ReportID=262> .

WHAT: Here is an interesting graphic relating the wealth of nations to their attitudes towards religion:



ANALYSIS: For this graphic, the **observational units** were countries, but it is based on separate studies done in each country. In the separate countries, a **sample** was chosen according to methodology described in the Pew Research report cited above. **Sample sizes** (specified precisely in the report) varied in the range 700-1200. For these country studies, the **observational units** were *adults*, a **binary/categorical variable answer to the question “is religion important in your life”** was observed.

Then to construct the graphic, the goal was to make a **scatterplot** of two **quantitative variables** for each country: the *percentage of adults in that country who say religion is important in their lives*; and the *wealth of that country*. For the first of these variables, the percentage responding “yes” in the country-based survey was used as an approximation – the **sample proportion**, a **statistic**, was used instead of the **population proportion**, which is the **population parameter** that is so hard to find exactly. For the second, an economic measure called the “purchasing power parity” was used as a proxy for the wealth of the country (this is a tool whose strengths and weaknesses are in the realm of economics, not statistics).

The **scatterplot** was then constructed. Also on the plot, the **regression line** was drawn. The **correlation coefficient** was also computed between the two given **variables** and displayed in the box of the graphic.

CRITICISM: It is possible to criticize the sample size and selection methodology, as it is described in the Pew Research report. For example, in some countries (particularly the United States, which is such an interesting outlier in the above graphic), there is enormous variation across the population in attitudes towards religion, so a very large, very carefully controlled (*e.g.*, randomized) sample would certainly be necessary. (Actually, many other countries are much more homogenous, so this is less of an issue.)

Criticisms of the sampling are essentially questioning the use of the sample statistic instead of the population proportion (as described above) – in essence, we are questioning the validity of the label “% Religion is important” on the y -axis, and suggesting that a more accurate label would be “% Religion is important in samples in these countries” (which would make the conclusions of examination of the graphic much less interesting!).

Other than these sampling issues, the graphic is well-constructed and presented. One small issue might be ask whether it really makes sense to put together in one scatterplot the data coming from such disparate countries as first world and developing countries, largely Judeo-Christian countries and Islamic or Hindu countries, and countries on different continents with such different histories and cultures. Looking at the labels of the data points on the plot, it is clear that some of these issues certainly cause clumping of the data in particular regions of the xy -plane. This would make combination of all the data into one graphic a kind of “extrapolation” that is perhaps unjustifiable.