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Religion and Economic Growth

Some researchers argue that explanations for economic growth should be broadened to include cultural determinants. Culture may influence economic outcomes by affecting such personal traits as honesty, thrift, willingness to work hard, and openness to strangers. Although religion is an important dimension of culture, economists to date have paid little attention to its role in economic growth.

But in **Religion and Economic Growth** (NBER Working Paper No. 9682), authors **Robert Barro** and **Rachel McCleary** analyze the influences of religious participation and beliefs on a country's rate of economic progress. The authors use six international surveys conducted between 1981 and 1999 to measure religiosity — church attendance and religious beliefs — for 59 countries. There is more information available about rich countries than poor ones and about countries that are primarily Christian. Barro and McCleary consider first how religiosity responds to economic development, government influences on religion, and the composition of religious adherence. They find that their measures of religiosity are positive-

ly related to education, negatively related to urbanization, and positively related to the presence of children. Overall, religiosity tends to decline with economic development.

The presence of a state religion is positively related to religiosity, probably because of the subsidies that flow to established religions in those countries. However, religiosity declines with greater government

Latin America), as well as Protestant Scandinavia, Orthodox Greece, and Muslim Pakistan and Turkey. Countries studied that exhibit high levels of pluralism include the United States, Germany, the Netherlands, Switzerland, Australia, Malaysia, Singapore, and South Africa.

The authors turn next to the assessment of how differences in

“For given religious beliefs, increases in church attendance tend to reduce economic growth. In contrast, for given church attendance, increases in some religious beliefs — notably heaven, hell, and an afterlife — tend to increase economic growth.”

regulation of religion and with the religious oppression associated with Communism. Greater diversity of religions — that is, religious pluralism — is associated with higher church attendance and stronger religious beliefs. Countries in the sample that had low levels of pluralism include some that are predominantly Catholic (Spain, Italy, Portugal, Belgium, Ireland, and much of

religiosity affect economic growth. For given religious beliefs, increases in church attendance tend to reduce economic growth. In contrast, for given church attendance, increases in some religious beliefs — notably heaven, hell, and an afterlife — tend to increase economic growth. In other words, economic growth depends mainly on the extent of believing relative to belonging. The

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authors also find some indication that the fear of hell is more potent for economic growth than the prospect of heaven. Their statistical analysis allows them to argue that these estimates reflect causal influences from religion to economic growth and not the reverse.

Barro and McCleary suggest that higher rates of religious beliefs stimulate growth because they help to sustain aspects of individual behavior that enhance productivity. They believe that higher church attendance depresses growth because it signifies a greater use of

resources by the religion sector. However, that suppression of growth is tempered by the extent to which church attendance leads to greater religious beliefs, which in turn encourages economic growth.

— Les Picker

Auto Insurance and Traffic Fatalities

When states adopt compulsory automobile insurance regulations and no-fault liability laws, some drivers may become a little more lax or relaxed. They may drive slightly faster or a little less cautiously, aware that the financial and legal consequences of an accident are reduced. They may be somewhat less likely to use seat belts and more likely to buy an old car without air bags, or to drink and drive, or simply to drive more often and further. As a result, the number of traffic fatalities increases, according to a study by **Alma Cohen** and **Rajeev Dehejia**. In **The Effect of Automobile Insurance and Accident Liability Laws on Traffic Fatalities** (NBER Working Paper No. 9602), they find that no-fault limits on driver liability in an accident, by diminishing the possibility of being sued, increase fatalities by about 10 percent.

That increase is significant. Traffic accidents claim over 40,000 lives each year in the United States, roughly the same as the total number of Americans killed during the Vietnam War, Cohen and Dehejia note. Americans spend roughly \$100 billion each year on automobile insurance premiums, and they bear more than \$250 billion of uninsured accident costs each year. So the impact of introducing no-fault insurance has meant an additional 5,160 to 6,450 lives lost in the United States, depending on the year, the authors calculate. Economists call such consequences “moral hazard costs.”

For this study, Cohen and Dehejia analyzed data from 50 states and the District of Columbia for 1970-98, a period during which most states adopted compulsory insurance requirements and 16 states adopted no-fault automobile insurance. By 1997, 45 states had compulsory insurance laws,

But drivers forced to buy insurance and now facing diminished liability in case of an accident might have driven less carefully, increasing accidents and fatalities. Looking at the data, the authors find a 2 percent increase in fatalities for each percentage point decrease in uninsured motorists. So, compulsory insur-

“No-fault limits on driver liability in an accident, by diminishing the possibility of being sued, increase fatalities by about 10 percent.”

although there were variations in the amount of insurance required and the methods of enforcement.

The introduction of compulsory insurance laws did lead to a reduction in the number of uninsured motorists. Compared to a base level of 12.9 percent, the number of uninsured motorists fell by 2.4 percentage points. The authors note that the introduction of compulsory insurance requirements made no difference to those who were already buying insurance voluntarily, but did have an effect on those individuals who were not previously buying insurance and chose to do so because of compulsory insurance, and on those individuals who chose to remain uninsured. Drivers who remained uninsured despite the new requirement in theory drove more cautiously, for fear of being in an accident, so their number of fatalities likely dropped.

ance is “not an unmitigated good,” the authors write.

These findings may be useful in assessing the social desirability of policy shifts in automobile insurance and no-fault liability rules. Though there are many positive aspects of compulsory insurance (such as greater assurance that the costs of an accident, including vehicle replacement or medical needs, will be compensated to some extent) and no-fault liability rules (such as reducing the court and other legal and administrative costs associated with driving and traffic accidents), the authors suggest that both policies also had unintended negative consequences in terms of increased fatalities. These consequences must also be taken into account.

— David R. Francis

What Works in Securities Laws?

In **What Works in Securities Laws?** (NBER Working Paper No. 9882) **Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer** compare securities laws in 49 countries to evaluate their effect on the development of stock markets. This analysis focuses on the provisions of the securities laws governing initial public offerings, distinguishing between private enforcement of laws through investor lawsuits, and public enforcement through regulatory action. The authors examine the relationship between these laws and various measures of stock market development, and interpret these relationships in terms of prevailing theories of securities laws.

In pursuit of their data, the researchers enlisted the aid of securities lawyers in each of the 49 nations in the study. These specialists supplied information regarding the relevant laws and binding judicial precedents applicable to an offering of shares to be listed in each country's largest stock exchange in December 2000.

To evaluate private enforcement of securities laws, the researchers analyzed the requirements for issuers, underwriters, and auditors to collect and to disclose information about security offerings, and the liability if they fail to do so fully. They also considered who legally bears the burden of proof in regard to a claim of negligence, misinformation, or omission in a prospectus. To assess public enforcement, the researchers evaluated the degree of independence enjoyed by the securities market's supervisory agency, its rule-making and investigative powers, and the scope of

sanctions that are applicable to violations of securities laws.

As measures of financial development in each country, the researchers considered the ratio of stock market capitalization to GDP, the number of publicly traded companies relative to popula-

markets. For example, the supervisor's investigative powers and the strength of criminal and non-criminal sanctions matter for only a narrow set of outcomes. But stock market development is strongly associated with such private enforcement measures as extensive disclo-

“Public enforcement appears to play a small role in the development of stock markets...Private enforcement systems foster greater investor confidence and ultimately more robust securities markets.”

tion, the value of initial public offerings relative to GDP, a survey measure of the ease of raising equity, the premium paid for control in corporate control transactions, the quality of accounting information provided by firms, and ownership concentration in the largest firms. The study controlled for the level of economic development, the efficiency of the judiciary, and the quality of corporate law.

La Porta, Lopez-de-Silanes, and Shleifer begin by comparing securities laws in common and civil law countries. In the private enforcement area, the authors note, common law countries have more extensive mandatory disclosure requirements and make it easier for investors to recover damages from stock issuers and their agents. In the public enforcement area, these differences are smaller for supervisor independence and greater for investigative powers, non-criminal, as well as criminal sanctions.

In an average country, public enforcement appears to play a small role in the development of stock

sure requirements and a relatively low burden of proof on investors claiming improper or inadequate disclosure from issuers. This leads the researchers to conclude that private enforcement systems foster greater investor confidence and ultimately more robust securities markets.

La Porta, Lopez-de-Silanes, and Shleifer affirm that investor protections clearly matter. By introducing extensive disclosure requirements and facilitating recovery of investor losses, securities laws reduce the costs of private contracting and litigation, and in this way promote financial development. The authors recognize that different mechanisms of social control of business are effective in different countries and markets. But in regard to securities markets, they say, the evidence suggests that the most effective arrangement is private enforcement of public rules, which encourages private recovery of damages by investors harmed by promoters.

— Matt Nesvisky

Increased Life Expectancies Imply Reduced Inter-country Inequality

Although GDP per capita is the common measure for a nation's quality of life, material gain is only one of many aspects of life that determine economic well being. Economic welfare also depends on lifespan: the number of years over which income is enjoyed.

In **The Quantity and Quality of Life and the Evolution of World Inequality** (NBER Working Paper No. 9765), co-authors **Gary Becker, Tomas Phillipson, and Rodrigo Soares** compare both income and survival rates of individuals in some 49 developed and developing countries between 1965 and 1995. The researchers assign monetary values to gains in longevity and then use these values, together with traditional per capita income data, to assess the evolution of economic well being, both within the various countries and across countries. They use the estimated value of the longevity gains to compute "income equivalent compensation" measures: the 1995 income that would give individuals the same welfare level observed in that year but with mortality levels from 1965. They define a measure of "full" income growth that incorporates both income and life expectancy gains, and use this concept to refine the results from traditional studies of economic well being.

Their findings indicate that countries beginning with lower income levels tended to grow more in terms of the "full" income measure than countries beginning with higher average incomes. In the 30-year period studied, the per capita value of the longevity gains stated in terms of annual income is equal to 28 percent of the observed growth in per capita income for the United States, and more than 1.5 times the growth in per capita income for less-developed countries, such as El Salvador, Chile, and

Venezuela. Overall, the authors estimate that the growth rate of the "full" income measure averages 140 percent for developed countries and 192 percent for developing countries.

This analysis suggests that between 1965 and 1995 poorer countries gained more in terms of longevity than richer countries did. Thus, the change in inequality in income per capita actually underes-

tical technology (new technologies, costly change of habits, and expensive surgical interventions).

Becker, Phillipson, and Soares conclude that life expectancy gains in the three decades studied were a significant component of the gains in economic welfare in both developed and developing nations. The total lifetime value of these gains for a person born in 1995 corre-

"Between 1965 and 1995 poorer countries gained more in terms of longevity than richer countries did. Thus, the change in inequality in income per capita actually underestimates the degree of convergence in welfare across countries."

timates the degree of convergence in welfare across countries.

Examining data on the causes of death in the various countries over this period, the authors can also estimate the gain in life expectancy attributable to reductions in mortality by each specific cause of death. They find that deaths due to infectious, respiratory, digestive, and congenital diseases are the most important factors determining the convergence of life expectancy observed in the period. Mortality rates from these causes of death fell more rapidly in poor than in rich countries. By contrast, changes in mortality rates attributable to nervous system, senses organs, heart, and circulatory diseases worked against convergence, falling more rapidly in rich than in poor countries. These trends are consistent with the notion that poor countries absorbed technology and knowledge originating in rich countries, at relatively low cost (educational health programs and simple interventions), while developed countries took advantage of the latest and ever more sophisticated advances in med-

sponds to three times the value of U.S. GDP per capita, and more than 10 times the GDP per capita for countries like Chile or Egypt. These values would have the same welfare impact as a permanent increase in income per capita of more than 10 percent for the United States, and more than 50 percent for Chile and Egypt.

Assuming that medical advances are available to the entire population of each country, the approximately 3.8 million Americans born in 1995 had an aggregate welfare gain equal to \$261 billion from the mortality reductions experienced by the United States between 1965 and 1995. The approximately 2.3 million Mexicans born in 1995 had an aggregate welfare gain equal to \$133 billion from the mortality reductions experienced by Mexico during the same period. For 1995, these numbers correspond to 5 and 27 percent of the aggregate GDP for, respectively, the United States and Mexico.

— Matt Nesvisky

Advertising and Price Effects on Adolescent Drinking

Intensive advertising by the alcohol industry has such a strong influence on adolescents that its elimination would lower underage drinking in general and binge drinking in particular, according to a study by **Henry Saffer and Dhaval Dave**. In **Alcohol Advertising and Alcohol Consumption by Adolescents** (NBER Working Paper No. 9676), the authors also find that hefty price increases could have a similar effect.

While many public health advocates claim that advertising plays an important role in adolescent drinking, the alcoholic beverage industry has rejected the connection. Companies contend that their advertising is aimed at adults and is intended to influence brand choice, not the decision of whether or not to drink. But neither side has produced much in the way of objective data to either support or refute a link between advertising and underage drinking.

Saffer and Dave wade into the controversy by examining underage drinking between 1996 and 1998 as documented in two exhaustive, long-standing surveys of youth behavior: the University of Michigan's Monitoring the Future survey, which effectively samples some 63,000 high school students across the country; and the 1997 National Longitudinal Survey of Youth Behavior, which is undertaken by the federal Bureau of Labor Statistics. They compare data from these surveys to detailed reports on the prevalence of alcohol advertis-

ing in local markets during the same period, collected by Competitive Media Reporting, a well-regarded, independent research firm that mainly serves the advertising industry.

The economic analysis reveals that alcohol advertising — the majority of which is aimed at consumers of beer and liquor, not wine — “has a positive effect” on whether youth drink at all and on how much young people imbibe; that is, it encourages underage drinking. The relationship is espe-

cially pronounced for underage female drinkers.

ing behavior; they conclude that doubling prices would reduce underage drinking by 28 percent and underage binge drinking by 51 percent. “As a result, both advertising and price policies are shown to have the potential to substantially reduce adolescent alcohol participation,” they state.

Saffer and Dave note that currently “both the level of alcohol consumption by adolescents and the level of alcohol advertising are considerable.” They point to data

“Doubling prices would reduce underage drinking by 28 percent and underage binge drinking by 51 percent.”

cially pronounced for underage female drinkers.

Saffer and Dave do not claim that the alcohol industry has deliberately targeted young people. They simply report that regardless of intent, advertising appears to have influenced underage drinking habits. The analysis “suggests that the complete elimination of alcohol advertising could reduce adolescent monthly alcohol participation from about 25 percent to about 21 percent. For binge participation, the reduction might be from about 12 percent to about 7 percent.” (Binge drinking is a term defined by most researchers to mean the consumption of five or more drinks at one occasion.)

Saffer and Dave go on to consider the effect of pricing on drink-

from the Monitoring the Future survey showing that 7.7 percent of 8th graders, 21.9 percent of 10th graders, and 49.8 percent of 12th graders report having consumed alcohol in the past 30 days. Meanwhile, Competitive Media Reporting “estimated that alcohol producers spent about \$1.5 billion” on ads in 2001, a 25 percent increase over 1998. Saffer and Dave point out that this figure is for “measured media” only and may account for as little as a third of total promotional expenditures. It does not include spending on such things as event sponsorships, Internet sites, movie product placements, or point-of-purchase ads.

— Matthew Davis

Incentives and Invention in Universities

American universities are an important source of technical change, accounting for roughly half of all basic research and almost 5 percent of all domestic patent grants in the United States. In the past two decades, technology licensing by American universities has grown dramatically. The number of U.S. patent awards to university inventors rose from 500 in 1982 to more than 3,100 in 1998. The number of licenses executed on university inventions more than tripled in the past ten years from 1,278 to 4,362 and gross licensing revenues increased nearly seven-fold, from \$186 million to nearly \$1.3 billion.

In **Incentives and Invention in Universities** (NBER Working Paper No. 9727), authors **Saul Lach** and **Mark Schankerman** investigate what drives academic research and technology licensing activities. They ask whether it is purely an intellectual pursuit or if economic incentives play a role. They conclude that economic incentives do, in fact, affect the number and the commercial value of inventions generated in universities.

Using panel data for 102 U.S. universities during the period 1991-9, Lach and Schankerman find that universities that grant higher royalty shares to academic scientists generate more inventions and higher levels of license income. This is true

regardless of university size or quality, or the amount of research funding and technology licensing inputs. These “incentive effects” are much larger at private universities than at public ones. In private universities, raising the inventor's royalty share actually increases the license income retained by the university. The incentive effects appear to work both through the level of effort of scientists and through the sorting of academic scientists across universities.

university according to specified royalty sharing schedules. The authors use the variation in royalty sharing arrangements to estimate the effect of this sharing on inventive output. Their data come from three sources. The main source is the Annual Licensing Surveys for the years 1991-9, published by the Association of University Technology Managers. To control for differences across universities in faculty size and scholarly quality, the authors use data

“Economic incentives...affect the number and the commercial value of inventions generated in universities.”

In addition, the authors find that private institutions have more effective and commercially oriented technology transfer activity than public universities. These findings are important because they imply that the design of intellectual property rights in academic institutions can have real effects and that private ownership appears to be important for effective technology transfer in the university sector. Why private ownership is important in this context remains an open, and important, question for future research.

In all U.S. research universities the cash flow rights from licensing inventions are shared between the inventor and various parts of the

from the 1993 National Survey of Graduate Faculty, conducted by the National Research Council. The third source of data is information on the distribution of licensing income between faculty scientists and the university; this information was downloaded from the websites of individual technology licensing offices. The mean value of the inventions disclosed was \$43,000. But licensing outcomes are very skewed — only a few universities produce large numbers of inventions and only a few inventions are very valuable.

— Les Picker

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