ECONOMIC GROWTH AND INSTITUTIONS: THE RISE AND FALL OF THE PROTESTANT ETHIC?

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ABSTRACT

This paper shows how a paradigm shift has taken place in the economic growth literature. Two papers will be used to show this paradigm shift. Implications of this shift will be stated and extensions of this shift will be given. The traditional growth literature before this paradigm shift is represented by the apparent heir to the Solow growth model, Mankiw, Romer and Weil. Their paper examines whether the Solow growth model is consistent with the international variation in the "standard of living." It argues that an augmented Solow model that includes "accumulation of human capital" provides an excellent description of the cross-country data. It claims to have shown why some countries are rich and others are poor. In the past ten years, however, the literature has taken quite a turn. The work of Hall and Jones represents this fundamental change. They claim that the standard economic variables used by Mankiw do not in fact explain economic growth or welfare across countries. They follow Doug North in asking why the rich countries chose to invest in capital in the first place. They therefore shift the question to the important new area of institutions in economic growth. Their paper shows that long run growth can be explained by differences in institutions and social infrastructure. This new literature looks promising but economists seem reluctant to examine one of the most crucial institutions in the history of the West, religion. This paper seeks to fill this gap in the literature by highlighting the work of Bradford DeLong and placing his religion variable into the Hall and Jones framework.

INTRODUCTION

The motivation for this study is to provide an alternative perspective to the new macroeconomic growth theory. While Mankiw, Romer and Weil, (MRW) have claimed that "the (human capital) augmented Solow model provides an almost complete explanation of why some countries are rich and others are poor" [2], Douglass North has taken another tack.

In his 1993 Nobel lecture, North stated that "Neoclassical theory is simply an inappropriate tool to analyze and prescribe policies that will induce development. It is concerned with the operation of markets, not with how markets develop. In fact, most societies throughout history got "stuck" in an institutional matrix that did not evolve into the impersonal exchange essential to capturing the productivity gains that came from the specialization and division of labor that have produced the Wealth of Nations." [3]

Such a theory sounds plausible,but how does one test such a theory empirically? One paper in particular set the stage for such an empirical analysis. Bradford DeLong discovered that "there is one striking ex ante association between economic growth in the period 1870-1979 and a predetermined variable: this variable is a nation's dominant religious establishment." [1]

DeLong further notes that while difficult to interpret, his regression results "do serve as an example of how culture may be associated with substantial divergence in growth performance.....a country's religious establishment has been a surprisingly good proxy for the social capability to assimilate modern technology." [1]

Is there a systematic relationship between a country's dominant religious establishment and the standard of living across countries? How do we examine this question? A review of the existing literature may help us to answer these questions. We move from the work of Mankiw et.al. in 1992 to the work of Hall and Jones in 1999.

I. PARADIGM ONE: THE SOLOW / MRW TEXBOOK MODEL

MRW model the production function above where (h) is the stock of human capital, and all other variables are defined as in the Solow model.

$$Y(t) = K(t)^{\alpha} H(t)^{\beta} (A(t)L(t))^{1-\alpha-\beta}$$

Substituting into the production function and taking logs gives an equation for income per capita in MRW.
This equation shows how income per capita depends on population growth and accumulation of physical and human capital. [2]

$$\ln \frac{Y(t)}{L(t)} = lnA(0) + gt - \frac{\alpha + \beta}{1 - \alpha - \beta} \ln(n + g + \delta) + \frac{\alpha}{1 - \alpha - \beta} \ln(s_\kappa) + \frac{\beta}{1 - \alpha - \beta} \ln(s_h)$$

DATA

MRW use a proxy for the rate of human capital accumulation (h) that measures the percentage of the working age population that is in secondary school. The remaining data are from the Real National Accounts constructed by Summers and Heston (1988). The data are annual and cover the period 1960-1988. We measure "n" as the average rate of growth of the working age population, defined as 15 to 64 years in the World Tables. We measure "invy" as the average share of real investment in real GDP, and Y/L as real GDP in 1988 divided by the working age population in that year. The sample of countries we use is a 66 country sub-sample from MRW. Finally, a protestant dummy variable is added to the model above to proxy for "dominant religious establishment." As DeLong notes, the construction of this dummy variable is a matter of taste. The dummy represents at a minimum those countries where the Protestant religious establishment was seriously contested. [1]

THE RESULTS

Table 1 illustrates the main two regressions in the Mankiw paper. In the second column, the dependent variable, log GDP per worker in 1985 is regressed on the MRW variables and the protestant dummy variable. The MRW results are robust and the proxy for "dominant religious establishment" is statistically significant.

The heart of the argument in this paper is that while MRW claim "an almost complete explanation" of economic development based on their three right hand side variables, they have not really "explained" development at all. It is true that rich countries have relatively more capital, both physical and human. It is also true that these variables are correlated with high incomes. However, the more interesting development question is why these countries acquired these types of capital inputs in the first place. The inclusion of the Protestant variable is suggestive even in the Mankiw framework.

To conclude that rational actors choose to acquire less capital and remain in the midst of high levels of absolute poverty commits the rational actor theory to a strange position indeed. Douglass North concludes that "it is necessary to dismantle the rationality assumption underlying economic theory in order to approach constructively the nature of human learning. History demonstrates that ideas, ideologies, myths, dogmas and prejudices matter." [3] The regression presented above reveals that "religion" does matter in history.

The positive coefficient on this variable indicates that countries with a Protestant religious establishment have "on average" higher income levels. As DeLong noted above, it is this variable and not capital or education or democracy or OECD status which has been associated with economic growth over the long run. It is therefore logical that these countries should now have higher incomes on average.

Equally significant is that this variable is the "only ex ante" variable of interest. It is the variable which comes first historically and explains future economic behavior. A dummy variable representing OECD countries would be trivial as it is a collection of those countries which have become rich and therefore begs the whole question of what caused this richness. It is quite another thing to claim that a country's religious establishment in 1600 would predict future income levels.

The second column in Table 1 shows that this Protestant variable is not statistically significant in explaining current economic *growth rates* across countries. The variable (y0) is the "level" of income in 1960 and the negative coefficient reveals that after controlling for the other MRW variables, we would expect income convergence in the following sense. Countries with initially high incomes (1960) would be expected to have lower growth rates. Richer countries would be expected to slow down and poorer countries would be expected to catch up. This is the conditional convergence hypothesis and it is confirmed by MRW in this regression.

It is more difficult to explain the absence of statistical significance in the protestant variable if one would hypothesize this effect earlier in history. One might suggest that the preferences of individuals have changed from the values of Protestantism to those

of a secular consumer culture. Or, one might suggest that other countries (i.e. the Asian miracle) have simply learned the lessons of development and copied the Protestant formula. Or the hypothesis may just lack explanatory power in this historical period. All of this conjecture makes it clear that a more serious theory is needed before one would place too much confidence in the Protestant hypothesis implied above. However, even though this variable was not significant in the growth regressions, it might still play an indirect role in economic growth.

Why might Protestant countries have grown more quickly over the long run as suggested by DeLong? Why might we still expect a positive connection between Protestantism and economic performance? Douglass North has given the broad theoretical answer to this question. To the extent that Protestantism provides an efficient set of property rights and encourages a modern set of economic incentives, one might anticipate positive economic performance. If one looks to the Reformation period itself, it is clear that at a minimum, the Protestant countries provided a relatively more decentralized economic environment for economic actors. Swanson gives an extensive analysis of this claim.

Swanson shows that a remarkable pattern emerges in Western Europe that remains constant for over three centuries. Countries with Catholic regimes tend to be more centralized. Countries with Lutheran or Anglican (Protestant) regimes tend to be intermediate and Calvinist (Protestant) regimes tend to be the most decentralized. No normative claims are being made here. But a clear linkage is being established between religion, regime and decentralization in order to add content to North's claim that institutions matter in history. Could this decentralization encourage the institutional matrix of " impersonal exchange essential" to modern economic life? [4]

II. PARADIGM TWO: INSTITUTIONS IN HALL AND JONES

The hypothesis of Hall and Jones is that "differences in capital accumulation, productivity and therefore output per worker are fundamentally related to differences in "social infrastructure" across countries." [6, p.84] By social infrastructure, they mean the institutions and government policies that determine the economic environment. Their second innovation is that their empirical framework differs from (Mankiw, Barro etc…) in that its focus is on income levels instead of growth rates. This is important because levels capture the differences in long-run economic performance, not transitory departures from long run behavior as in the Mankiw and Barro frameworks. Put simply, rich countries have grown rapidly for long periods of time. Many papers in the growth literature say they study long-run growth, but their data sets only measure growth from 1960-2000 at most. Most growth textbooks would not consider this to be long-run performance.

THE MODEL

The basic econometric approach of Hall and Jones is taken from their earlier work [5] where the specification is easier to follow and where the results are not significantly different from their later paper. The approach is to examine the relation between a collection of determinants – GADP, Type of Economic Organization, Openness, Language, and Climate – and the log of output per worker in 1998. They use OLS.

THE DATA

The data set includes 127 countries for which they were able to construct measures of the physical capital stock using the Summers and Heston data set. For these 127 countries, they were also able to obtain data on the type of economic organization, primary languages spoken, and geographic information. However, missing data was a problem for four of their variables. They imputed values for these missing data. The primary regressors in their regressions will now be defined.

GADP is their measure of Government Anti-Diversion Policy. It is their primary "institutional variable." They follow Knack and Keefer (1995) using an equally weighted average of 5 categories for the years 1986 – 1995. Two of the five categories relate to the government's (positive) role in protecting against private diversion: (i) law and order, and (ii) bureaucratic quality. Three categories relate to the government's possible (negative) role as diverter: (iii) corruption, (iv) risk of expropriation, and (v) government repudiation of contracts. A potential problem with their specification is that their most important variable for explaining long run growth is constructed using very recent data for a variable which they acknowledge to be endogenous. They address this problem in their 1999 paper. Even with this correction, however, they are still using 1990's institutional data to explain economic growth from 1800-2000. This is a problem.

OPENNESS to trade is constructed following Sachs and Warner (1995). Their index measures the fraction of years during the period 1950 to 1994 that the economy has been open. A country is open if it satisfies five openness to trade criteria.

TYPE OF ECONOMY is meant to capture the extent of government involvement in production. They use a classification made by Freedom House (1994). Countries are classified as (1) Capitalist or Mixed Capitalist, (2) Capitalist-Statist or Mixed Capitalist Statist, or (3) Mixed Statist or Statist.

LANGUAGE is classified following Gunnemark (1991). Two variables are constructed: ENGFRAC, the fraction of a population which speaks English as their primary language and EURFRAC, the fraction of the population that speaks any of the European languages as their primary language, including English.

CLIMATE is proxied using distance from the equator, measured as the absolute value of the latitude in degrees divided by 90 to place it on a 0 to 1 scale.

THE RESULTS

Hall and Jones' results are given in Table 2 for the estimation of the basic relation between output per worker and the determinants. Note that all regressors are measured on a [0,1] scale so that the coefficients are directly comparable across variables. 77 percent of the variation in log Y/L is accounted for by their determinants. All of the variables above are statistically significant. A thorough discussion of several problems with the model including identification, endogeneity, measurement error and simultaneity is given in Hall and Jones [6]. One of these problems, however, feeds directly into the discussion which follows.

Hall and Jones claim that "the other important characteristic of an instrument is lack of correlation with the disturbance term. To satisfy this criterion, they ask whether European influence was somehow more intensively targeted toward regions of the world that are more likely to have high output per worker today. They note that in fact, this does not seem to be the case. Europeans did seek to conquer and exploit areas of the world that were rich in natural resources such as gold and silver or that could provide valuable trade in commodities. There is no tendency today for these areas to have high output per worker." [6, p.101] They need this assumption for their results to hold. By focusing on "these areas", Hall and Jones, commit themselves backward in economic theory and look only at the basic economic variables (resources) for explanatory power. However, their current thesis is about institutions. When one looks at "these areas" with "institutional" glasses on, one might reach a very different conclusion.

Using their own language, we again ask "whether European influence was somehow more intensively targeted toward regions of the world that are more likely to have high output per worker today?" The answer is yes and the channel by which it traveled may be the institution called Protestant religious establishment. This is precisely the result which DeLong reports. Our data include a list of the 13 Protestant countries used in the Bradford DeLong paper. One sees not only a striking European influence in several now rich countries but also a striking correlation between Protestant and about every explanatory variable used by Hall and Jones. Remember, all variables are scaled [0,1]. Thus, when one sees mean values for the Protestant country institutional variables in the 0.7 (0-1) range and mean values for the non-Protestant countries in the 0.4 (0-1) range, it seems that Hall and Jones have some explaining to do. They are aware of the DeLong variable and so the omission of its impact is a mystery.

CONCLUSIONS

An economic revolution has taken place. Ten years ago, institutional variables were not considered to be economic variables. Now they are. Doug North won a Nobel prize which validated the linkage between institutional variables and long-run economic performance. The discipline of economics is equally slow to acknowledge perhaps the most powerful institution in Western civilization, religion. Only reason, itself, can make a competing claim. Ideas matter and we claim to study rational man. Rational man evolved in Athens and look a long hibernation through the Dark Ages. He was awakened in the 16^{th} century by a host of social forces in Western Europe alone. These forces in turn led to the phenomenon of long-run economic growth from 1800-2000 for many countries. Which ones? It is the job of economics to predict which countries grew fast and to explain why they grew fast. Here is my concluding prediction. Give me a country in 1600 that had a Protestant led contest for religious and political power and I will show you a country that is rich today. Spurious you

say. Give me that country again and I predict that it is a democracy, has high human capital endowments, a Parliament that is independent, an insulated Judicial branch, a fairly independent Central Bank, high marks in political liberty and civil rights, high investment in women's human capital, high levels of innovation and productivity, a mature system of property rights protection. I conclude.

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Table 1 Mankiw et.al. estimates with Protestant dummy	GDP 1988	GDP Growth 1960-1988
Constant	9.61 (7.32)	4.09 (3.32)
initial 1960 gdp (y0)	------	-0.38 (-4.55)
investment (invy)	0.61 (3.87)	0.57 (4.90)
pop growth rate (n)	-0.66 (-1.46)	-0.47 (-1.39)
human capital (h)	0.69 (7.18)	0.26 (2.84)
Protestant = 1	0.59 (3.62)	0.06 (0.49)
R^2	0.78	0.42

Table 2 Hall and Jones 1996	GDP 1998
Constant	6.596 (32.0)
GADP Government Anti-Diversion Policies	1.523 (3.5)
Fraction of years open since 1950	0.82 (4.2)
Type of Economy: Statist or Mix State	-0.028 (-0.18)
Cap-Stat or mixed	0.398 (3.37)
Fraction English	0.782 (4.2)
Distance Equator	0.659 (5.4)
	2.184 (5.6)
R^2	0.77