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CLIOMETRICS AND THE NOBEL

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CLIOMETRICS AND THE NOBEL

ABSTRACT

In October 1993, the Royal Swedish Academy of Sciences awarded the Nobel Prize in Economics to Robert William Fogel and Douglass Cecil North "for having renewed research in economic history." The Academy noted that "they were pioneers in the branch of economic history that has been called the 'new economic history,' or 'cliometrics'." In this paper I address what this cliometrics is and how these two Nobel Prize winners furthered the discipline of economics.

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In October 1993, the Royal Swedish Academy of Sciences awarded the Nobel Prize in Economics to Robert William Fogel and Douglass Cecil North 'for having renewed research in economic history.' The Academy noted that 'they were pioneers in the branch of economic history that has been called the "new economic history," or "cliometrics."' What is this cliometrics, and how have these two Nobel Prize winners furthered the discipline of economics?

Cliometrics is, quite simply, the application of economic theory and quantitative methods to the study of history. The term marries the muse of history -- *Clio* -- to measurement and was coined by Stanley Reiter, a mathematical economist then at Purdue University and a collaborator of two of the first cliometricians, Lance Davis and Jonathan Hughes.

History serves economics in various ways.¹ Most importantly, history is essential because it is risky to base conclusions on transient phenomena. The past, many economic theorists have discovered, is a giant experiment station for economic ideas. And empiricists have learned that historical data are often better (for example, because of less litigious environments) and provide larger samples (that is, longer time series).² The histories of the developed world are backdrops, and often provide advice, for current developing countries. Finally, remnants of the past, which shape the realm of the possible today, are always with us as laws, norms, structures, institutions, and even people. In short, only the oblivious can ignore history in modern economics, and only the unenlightened would choose to do so.

Given the large domain of economic history, it should not be surprising that Robert Fogel and Douglass North are not the first Nobel Prize winners in economics to study and use history. Milton Friedman used the past to understand the role of money; John Hicks studied economic history to understand economic growth; W. Arthur Lewis explored economic history as a backdrop for the problems of development; and Theodore Schultz examined it to learn about human capital. Robert Fogel's mentor Simon Kuznets was an economic historian in all these ways.

Yet Fogel and North do not simply join the list of stellar economists who have used history. They are distinctive, because for them economic history is not a handmaiden of

economics but a distinct field of scholarship. Economic history was a scholarly discipline long before it became cliometrics. Its practitioners were economists and historians studying the histories of economies. Both called themselves economic historians. The new economic history, or cliometrics, formalized economic history in a manner similar to the injection of mathematical models and statistics into the rest of economics.

The Birth of the New Economic History

The revolution that brought the new economic history occurred in the early 1960s. As in many such revolutions, the young were pitted against the old. It would be fair to say that the more established members of the economic history profession, many of whom were historians, controlled the Economic History Association at least to 1960s. However, Douglass North, a champion of the new economic history, and William Parker became the editors of the Journal of Economic History (the EHA's scholarly journal) in 1960, a post they shared until 1966. The Journal of Economic History remained a journal read by economic historians from both history and economics,³ whereas Explorations in Entrepreneurial History (later Explorations in Economic History)⁴ became and continues to be a major outlet for the new economic history.

The young turks, who included Fogel and North at the very outset, formed their own scholarly meetings at Purdue University (Purdue University had a glorious decade of prominence in cliometrics). They called their field "the new economic history," a term actually coined by Douglass North (Hughes, 1982). The Cliometrics Meetings, as they became known, are still held annually and have retained their open, argumentative, and exhilarating character.

The new economic history was able to blossom in the 1960s because its foundations had recently been laid. A stock of quantitative knowledge produced by economists, many at the National Bureau of Economic Research, gave economic historians a clearer sense of when economies grew and what the sources of growth were. For example, a joint meeting in 1957 of the Economic History Association and the National Bureau of Economic Research (Conference

on *Research in Income and Wealth*) produced a volume containing various data series which formed the basis for much of the new economic history (Parker, 1983). In that volume are Robert Gallman's estimates of commodity output, Towne and Rasmussen's farm gross product and investment series, Richard Easterlin's regional income estimates, Stanley Lebergott's wage series, Ethel Hoover's price index, Edward Budd's factor shares, and North's estimates of the balance of payments, all for the nineteenth century United States. North (1977) has credited the conference with spawning the new economic history.

No longer did economic historians have to rely on series for particular industrial commodities or those on international trade to proxy the entire economy. The task of measurement was in no way complete, but enough groundwork had been set to enable the flowering of an entire profession.

Formalization caused more of an uproar in economic history than elsewhere in economics.⁵ In most of empirical economics, more precise estimation of economic relationships and more precision about what one was estimating were viewed as progress. But in economic history there was considerable resistance. Those who were formalizing the field were viewed as outsiders. They were economists, not historians or economic historians. The insiders claimed the outsiders were theorists with little knowledge of the facts, and with no sense of history.

In large measure the opposition was intense because the modeling and statistical methods were alien to many practitioners. But I believe that it was also because the conclusions ran counter to orthodoxy. When economic history was formalized, there was already a huge fossilized stock of accepted wisdom concerning major projects, figures, and events of the past.⁶ Such accumulated wisdom did not exist to the same degree in other fields of empirical economics. The other empirical fields of economics were newer or had been less cumulative. The conclusions of one generation of economists in other fields, therefore, could be overturned without mounting a major challenge to an entire field. If one generation claimed labor supply functions were backward-bending but the next estimated a positive supply elasticity using new

data and methods, their results could be reconciled by merely supposing that in the meanwhile the underlying parameters had changed.

The most important and immediate innovation from the formalization of economic history was the 'counterfactual.' The most vivid example comes from the work of Robert Fogel and concerns the first of his projects that was singled out by the Swedish Academy for recognition (Fogel, 1964). Historians had for some time claimed that the railroad was the engine of economic growth in nineteenth century America. By stating that the railroads were essential to growth, the historians were claiming that the railroads caused it. But if railroads caused growth, then the growth would have been considerably less in the absence of the railroads. Robert Fogel reassured these claims, then, as a "counterfactual." The hypothesis was: had the railroads not been built, America would have grown much more slowly. Fogel (1964), which will be discussed more in the next section, is actually an extended thought-experiment of what the U.S. economy would have looked like if the railroads had never been built.

The notion of a counterfactual was hard for many historians to swallow. It involved the hypothetical removal of the largest enterprise at the time, the first big business in America, one of the most productive sectors, and some of the wealthiest Americans, to mention just a few parts of the mental experiment. But, noted Fogel, those who were making claims about the indispensability of the railroad were implicitly invoking precisely this experiment. He was merely making the claim explicit and subjecting it to hard evidence.

Robert Fogel and Douglass North have moved the discipline of economic history in a similar manner. At the outset of their careers, their methodologies and subject areas were quantitative in the National Bureau of Economic Research tradition.⁷ However, they have now emerged as rather different scholars with distinctive research methodologies. Fogel is the premier empiricist, who establishes a fact and then establishes it over and over again, until he is confident he can persuade the most determined skeptic. Douglass North is the grand theorist, arbitrating between economic history and organization theory. Fogel's current subject area investigates the

nasus of nutrition, health, and productivity. North's is the role of institutions and organizations in economic growth, with particular reference to the countries of the former Soviet bloc. Yet in their early works, one can see the fuller agenda they would eventually pursue.

Early Work on Transportation

It is not much of a coincidence that Fogel and North both focused on changes in the price of transportation. In the 1960s, a primarily theoretical literature emerged conjecturing that economic growth could be enhanced by decreased transport costs, at least under special circumstances. Even when productivity change is moving at a snail's pace in the goods-producing sectors, a decrease in the price of transportation can increase national income substantially.⁸ Developing economies were advised to increase certain capital expenditures if they wanted to grow, especially "infrastructure" and, most especially, transportation. How decreased transport costs affected the economic growth of the United States – the great success story – was a natural.⁹

Fogel's *Railroads and American Economic Growth* was an immediate classic. Derived from his doctoral dissertation at Johns Hopkins University, it is a volume in search of a single number – the social savings of the American railroads in 1890.¹⁰ By the term "social savings," Fogel meant the increase in social surplus from the decrease in transport costs. The most cited finding of the book is the "interregional" social savings calculation, which pertains to the large trunk lines that linked the food exporting cities of the Midwest to the food importing cities of the East. Fogel calculated that if in 1890 the railroads had not existed and if, in their stead, the four major agricultural goods (wheat, corn, pork, and beef) were transported on existing water routes, gross national product would have declined by less than 0.6 percent. For those who believed the great east-west railroads were indispensable to American economic growth, the 0.6 percent figure was a blow. The preliminary results from the interregional social savings calculation were presented by Fogel to the first Cliometrics Meetings held at Purdue University in December 1960.

Etched in the memory of all who attended was a presentation by this master debater, who would deliver countless more presentations on the road to winning the Nobel.

Anyone who looks at a map of the United States, and thinks hard about the concept of marginal cost, would find the result on the interregional social savings to be less surprising than it seemed in 1960. The United States has a lot of navigable waterways and the cost of water transportation was actually lower than that for railroads, although water transport was slower and less reliable, involved costly linkages, and required some land transport. Other countries were not so fortunate, and for them (for example, Mexico, for which the same calculation has been made¹¹), the interregional social savings of the railroads was greater.

In some sense the real controversy, and the more difficult calculation, concerned the social savings of the railroads within regions, termed the 'intra-regional' social savings. The intra-regional calculation involved the thought-experiment of removing all the railroads that transported goods from farms to the markets of the Midwest and computing how much gross national product would have declined. The railroads had more costly alternatives here than they did for the long-haul routes. There were some navigable waterways, to be sure, but there were also considerable distances to move goods over land, a costly venture before the gasoline engine and trucks.

Fogel (1964) made four calculations of the within-region social savings, depending upon various assumptions concerning the alternative mode of transportation and the area cultivated.¹² The alternative modes involved either existing water and land routes, along with a set of canals that would, according to Fogel, probably have been built had the railroads not existed. Fogel also pointed out that with higher costs of transportation, it would not have been cost effective to cultivate some areas of the country. A reasonable calculation, then, takes out from cultivation lands that were beyond the feasible margin but adds back into the social savings the loss in net income from those lands.¹³ The intra-regional social savings estimated in this manner is about 1 percent of 1890 GNP.

Thus, the total social savings from shipping agricultural commodities both between and inside regions comes to less than 2 percent of GNP in 1860. Agricultural commodities, by ton-miles shipped, were about one-fourth of all goods shipped by rail, but there is no obvious reason to multiply the agricultural social savings figure by a factor of exactly four. Fogel omitted, too, the social savings of the railroads in passenger travel. But on the other side of the balance sheet, the calculation does not include the probability that the internal combustion engine would have been invented and commercialized sooner in the absence of the railroad.

Fogel has noted that his original dissertation proposal called for measuring how large the social savings of the railroads were, and that he was truly startled when he discovered the savings were small. But whether or not one views the social saving as large or small is in the eyes of the beholder. It was small in comparison with the claims of those who came before Fogel. But it may be viewed as large in comparison with the social savings from any other single mechanical device in U.S. history. Whatever the judgment on relative magnitude, Fogel offered a most careful and meticulous estimate of the actual size.

Douglass North's best-known research in transportation concerns ocean shipping from 1600 to 1860. The costs of ocean shipping decreased during much of the period, more so in the nineteenth century than before. A large part of the decrease, argued North (1968), came from an increase in total factor productivity. But the question was whether total factor productivity gains were rooted in technological advances or some other innovation. North found that from 1600 to 1794 productivity advanced at a slow rate, but that virtually all of the gains were due to decreased crew size and less time spent idle in ports. For the period from 1814 to 1860, productivity increased faster, at almost ten times the annual rate in the previous two centuries. Virtually all the gain here was due to an increase in the size of ships and to their greater load factor. For most of the two and a half centuries considered, goods coming from the New World to the Old World were bulky raw materials, whereas those moving in the other direction were compact manufactured goods. In the 1840s and 1850s, however, there was a large increase in

immigration, which meant that ships returned to the New World with cargo, not in ballast. The load factor thereby increased.

The surprising finding is that for both periods, technological change was less responsible for the increase in productivity than were other innovations – a sharp reduction in piracy and organizational changes that increased round-trips per year by a factor of three.¹⁴ With less piracy, ships needed fewer crew members and could carry more goods and fewer armaments. With less need to arm ships, technologically superior vessels could be used. For example, the Dutch *flute*¹⁵ had been used in the Baltic long before the modified flute made it to the ocean. But the reason these superior vessels were used in the Baltic was that piracy had been significantly reduced there, and the flute generally carried no armament. The important point for economic history and for North's intellectual development is that institutions interact with technology. One without the other does not produce economic growth. North learned the lesson well and shifted his attention for the next 25 years to a study of institutions.

In their work on transportation, both Fogel and North did case studies exploring whether growth occurs because a particular sector takes off or because of a larger set of changes across many sectors. The answer, from Fogel, was that the sector identified with growth – that of railroad transport – was not solely or primarily responsible. Rather it was the contributions of many sectors. North's answer was that even if one sector pulled the economy along, the path of development depended crucially on institutions that, in turn, derived from the distribution of income, culture, and politics.

On the Economic Impact of Slavery

An area of greater overlap between the works of North and Fogel is the impact of slavery on the growth of the American South. In the midst of a growing industrial nation with a mobile and free labor force sat an agricultural slavocracy. North's volume *The Economic Growth of the United States, 1790 to 1860* (1961) and Fogel and Stanley Engerman's *Time on the Cross* (1974),

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Abstract

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