An Introduction to the Handbook of Cliometrics

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The New Economic History (a term proposed by Jonathan Hughes) or Cliometrics (coined by Stan Reiter), meaning literally the *measurement of history*, is of very recent origin. Its first practitioners are considered to be Alfred Conrad and John Meyer, who published "Economic Theory, Statistical Inference, and Economic History," in the *Journal of Economic History* in 1957 after its presentation earlier that year at the joint meetings of the *Economic History Association* and the *NBER Conference on Research in Income and Wealth*. They followed that up in 1958 with a paper demonstrating the cliometric methodology as it applied to slavery in antebellum America. Robert Fogel's seminal research work on the impact of the railroad on American economic growth is in extension, a true revolution in the history of economics, even a complete break with the tradition. It re-established a role for history in economics, by expressing it in the language of the discipline. Today one can even say that it is an expanding domain in economics, contributing to new debates and challenging conventional wisdom. The use of econometric techniques and economic theory has contributed to the rejuvenation of economic history debates, made quantitative arguments unavoidable, and contributed to the emergence of a new historical awareness among economists.

Cliometrics does not concern economic history in the limited, technical meaning of the term. It modifies historical research in general. It represents the quantitative projection of social sciences in the past. The question of knowing whether slavery benefited the United States before the Civil War or if railways had substantial effects on the development of the US economy is as important for general history as for economic history, and will necessarily weigh on any interpretation or

appraisal (anthropological, legal, political, sociological, psychological, etc.) of the course of American history.

Furthermore, cliometrics challenges one of the basic hypotheses of the idealistic school: that history can never provide scientific proof because it is impossible to subject unique historical events to experimental analysis. On the contrary, cliometricians have shown that such experimentation is possible by construction of a counterfactual that can be used to measure the deviation between what actually happened and what could have happened under different circumstances. Robert Fogel famously used a counterfactual to measure the impact of the railroad on American economic growth. This methodological principle is perhaps, along with historical time series econometrics, the most important contribution of cliometrics for researchers in social science in general and historians in particular.

The methodological features

Fogel defined the methodological features of cliometrics. He considered it fundamental that cliometrics should stress measurement while recognizing the existence of close links between measurement and theory. Indeed, unless it is accompanied by statistical and/or econometric processing and systematic quantitative analysis, measurement is just another form of narrative history. It is true that it replaces words with figures, but it does not bring in any new factors. In contrast, cliometrics is innovative when it is used to attempt to model all the explanations of past economic development. In other words, the main characteristic of cliometrics is the use of hypothetico-deductive models that call on the closest econometric techniques with the aim of establishing the interaction between variables in a given situation in mathematical form.

This generally consists of constructing a model—of general or partial equilibrium—that represents the various components of the economic evolution in question and showing the way in which they interact. Correlations and/or causalities can thus be established to measure the relative importance of each over a given period of time.

The final ingredient of the cliometric approach concerns the concepts of a market and price. Even in areas where there is no explicit market, the cliometric approach will often study the subject by analogy with the market concepts of supply, demand, and price.

So far, hypothetico-deductive models have mainly been used to determine the effects of innovations, institutions and industrial processes on growth and economic development. As there are no records saying what would have happened if the innovations in question had not occurred or if the factors involved had not been present, this can only be found out by drawing up a hypothetical model used for deducing a hypothesized alternative situation – i.e. the counterfactual. It is true that the use of propositions contrasting with the facts is not new in itself. Such propositions are implicitly involved in a whole series of judgements, some economic and others not.

The use of such counterfactual analysis has not escaped criticism. Many researchers still believe that the use of hypotheses that cannot be verified generates quasi-history, rather than history proper. Furthermore, the results obtained by the most elaborate cliometric applications have been less decisive than many cliometricians had hoped for. Critics are doubtless right to conclude that economic analysis in itself, with the use of econometric tools, is unable to provide causal explanations for the process and structure of change and development. There appear to be non-systematic breaks in normal economic life (wars, bad harvests, collective hysteria during market crashes, etc.) that require overall analysis but that are too frequently considered as extrinsic and abandoned to the benefit of an *a priori* formulation of theoretical suppositions.

Nevertheless, in spite of the disappointments resulting from some of its more extreme demonstrations, cliometrics also has its successes, together with continuous theoretical progress. The risk would obviously be that of allowing economic theory to neglect a whole body of empirical documentation that can enrich our knowledge about the reality of economic life. Conversely, theory can help to bring out certain

constants and only mastery of theory makes it possible to distinguish between the regular and the irregular, and the foreseeable and the unforeseeable.

The main achievements

To date, the main achievements of cliometrics have been to slowly but surely establish, in the Fogel tradition, a solid set of economic analyses of historical evolution by means of measurement and theory, and, following the path blazed by Douglass North, to recognize the limits of neoclassical theory and bring into economic models the important role of institutions. Indeed, this latter focus ultimately spawned a new branch of economics altogether, the new institutional economics. Nothing can now replace rigorous statistical and econometric analysis based on systematically ordered data. Impressionistic judgements supported by doubtful figures and fallacious methods and whose inadequacies are padded by subjective impressions have now lost all credibility. Economic history in particular should cease to be a "simple" story, illustrating with facts the material life during different periods, and become a systematic attempt to provide answers to specific questions. The ambition should be to move from the *verstehen,* or understanding, to the *erklären,* or explanation epistemology.

By extension, the more the quest for facts is dominated by the conception of the problems, the more research will address what forms the true function of economic history in the social sciences. This change of intellectual orientation, of cliometric reformulation, can thus reach other human and social science disciplines (law, sociology, political science, geography, etc.) and engender similar changes.

Indeed, the most vigorous new trend in the social sciences is without a doubt the preoccupation with quantitative and theoretical aspects. It is the feature that best distinguishes the concepts of the current generation of scholars from its forbears. Even the most literary of our colleagues is ready to agree to this. There is nothing surprising about this interest. One of the characteristic features of today's younger generation of scholars is most certainly that their intellectual training is much more deeply marked by science and the scientific spirit than that of the generations that preceded them. It is, therefore, not

surprising that young scientists should have lost patience with regard to the tentative approach of traditional historiography and have sought to build their work on foundations that are less "artisanal."

Human and social sciences are thus becoming much more elaborate in the technical respect, and it is difficult to believe that a reversal of the trend is likely to occur. However, it is also clear that a significant proportion of human and social scientists have not yet accepted the new trends aimed at using more elaborate methodology and clear concepts conforming to new norms in order to develop, in a *Fogelian* tradition, a truly scientific human and social science.

A branch of history?

For many authors —and many of its protagonists— cliometrics appears to be first of all a branch of history. Using economic tools, techniques and theories, it provides answers to historical, rather than economic, debates per se.

The meaning of the word "empirical" for (American) economic historians has varied considerably with the passing of time. One can observe a shift from a concept of empirical fact as understood by the "classical historian" (for whom anything, as opposed to only quantitative data, retrieved from archives can be used in his demonstration) to one as understood by (applied) economists (the empirical aspect consists of analysing numerical time series) and a convergence of theoretical viewpoints of historians and economists thanks to a common interest in the building of theories of development.

Here, Simon Kuznets seems to have played a key role by emphasising the importance of performing at the onset a serious macroeconomic analysis of the major quantitative macro-changes in the past economic history, before possibly identifying certain *sectors* that are deemed central for economic development. One should note that even in his concern to combine history with economic analysis, he thought of a theory of development that remained inductively based upon the observation of the

major past evolution enlightened by the analysis of long run time series patiently accumulated by the economic historian.

This (inductive) view is therefore intimately linked with the historical current in economics, the *German Historical School*, despite the use of more sophisticated techniques. It could be said that the two disciplines became closer, but probably within the frame of 'inductive' economics. On top of that, despite those early interests in building a kind of historically (i.e. inductively) grounded development economics, cliometrics mainly tried to provide answers to *historiographical* questions — and therefore spoke more to the historian than to the standard economist. Econometric techniques may be used, with the reconstitution of time series and identification of missing figures by interpolation or extrapolation — something, by the way that annoys professional historians. But these cliometric procedures have nonetheless a historical vocation - that of shedding light on historical questions— considering economic theory or econometrics as auxiliary disciplines of history. And when the cliometric approach was mobilised to build a development theory based upon clearly measured facts, it developed an economics more akin to the objectives of the German Historical School than one participating to the movement towards highly abstract and deductive theory that characterised the development of the neo-classical school of the time.

The conflict between Kuznets and Walt Rostow regarding the stages in economic development was actually based upon the *empirical* foundations of Rostow's theory and not at all on a debate concerning the shortcomings of a very inductive and aggregate perspective lacking formal rigor (no use of growth theories) or microfoundations, which would doubtless be the main subject of criticism today. In short, either cliometrics is still a (modernised) branch of (economic) history —in the same way as the modernisation of methods in archaeology (from carbon-14 measurement to the use of statistical techniques such as discriminant analysis) does not turn the discipline into a branch of natural science— or the cliometric approach is

mobilised to obtain theoretical results grounded more on induction from collected time series than from a deductive explicit modelling exercise, i.e. economic theory that must be primarily founded on facts and a generalisation of empirical evidence. In this way it contributes to an economic science that is more related to the German Historical School than to the neoclassical perspective.

An auxiliary discipline of economics?

But this is not the end of the story. Some recent work in cliometrics performed by economists (*stricto sensu*) reveals the possibility of a cliometrics that could also be an auxiliary discipline of *economics* per se. As such, it should be part of the toolkit and competencies of all economists. However, as the term auxiliary discipline indicates, it could only fulfil its proper role for economics if it remains slightly (not too much) outside the realm of standard neoclassical economics. It must be a compound of the application of the newest econometric techniques and economic theory with the old institutional and factual culture characterising the old economic history.

History is indeed always a discipline of synthesis. It should also be the case for cliometrics. If not, if cliometrics were to be deprived of all its "historical dimensions," it would simply cease to exist (it would *only* be economics applied to the past, or mere retrospective econometric exercises). To be helpful for the economics profession at large, its main job should be to mobilise all the relevant information that can be gathered from history to enrich or even challenge economic theory (or theories). And this relevant information should also include cultural or institutional development, provided that they can be properly presented as useful for the profession.

A conventional belief among economists (in fact, that of Lord Kelvin) is that "qualitative is poor quantitative". But could it not be possible that "quantitative is poor qualitative" might also sometimes be true? A big difference between economists and historians is the sense of so-called historical criticism and the desire to avoid any anachronism. In addition to close examination of the historical sources, this involves the close examination of the institutional, social and cultural context that forms the framework

constraining the players' behaviour. It is true that the (new) economic history will not build a general theory —it shares too strongly the belief in the necessity of examining economic phenomena in their context— but it could suggest a few useful ideas and insights, based upon solid investigations and correctly estimated stylised facts, to economists who are attempting to develop laws of economic behaviour (unlike history, economics is still a nomological science). Economists and cliometricians can also cooperate and jointly author research. This is a view shared by Daron Acemoglu, Simon Johnson, James Robinson, and Oded Galor, among others, trying to use the material derived from traditional history to build new ideas useful for economic theorists.

In summary, it could be contended that a good cliometric practise is not an easy exercise. Becoming too narrowly "economic," it would not be possible for cliometrics to answer certain questions that would require, for example, more information about the microstructure of financial markets or the actual functioning of stock exchanges during the period under scrutiny — it would only measure phenomenon that it cannot explain. It would require the specific approach (and extraneous information) of the historian to describe the reasons for the lack of relevance (or understand the shortcoming) of such an economic theory in a given context (precise place and period). It is perhaps only in this regard that cliometrics can provide something for economists by suggesting lines of research. However, if it became too "historical," cliometrics would cease to appeal to the economics profession. Economists need new economic historians aware of their debates and their interests.

A full-fledged field of economic theory?

Last, but not least, cliometrics could one day be more than just an ancillary discipline of economics and instead become a full-fledged field of economic theory. There is indeed another possibility: viewing cliometrics as the science of the emergence of institutional and organisational structures, and that of path dependence. Economic history would use the old techniques of the discipline coupled with the state of the art arsenal of

econometrics in order to reveal stylised facts about the efficiency of various institutional arrangements as well as on the causes and consequences of institutional change. It would help the theorist in developing a true theory of institutional change, i.e. one that at the same time would be general (serving the needs of policy makers today, for example) and theoretically solid (grounded on economic principles), while solidly grounded on empirical regularities as put forward by a joint economic and historical analysis. This analysis of *institutional morphogenesis* would be the true theoretical part of a cliometric science that would emancipate itself from its apparently purely empirical fate — being the playing ground of long run econometricians. It is clear that economists' desire for generality and their fascination for the mathematical science does not encourage them to pay too much attention to contextualisation. However, neo-institutionalist economists like North warn us to seriously consider institutional (including cultural) contexts.

Our ambition for the Handbook of Cliometrics was thus also aimed at encouraging economists to examine more systematically these theories grounded upon history and nevertheless aiming at the determining general laws on the creation of institutions or of institutional changes. Beyond the study of long run quantitative data sets, a branch of cliometrics is more and more focused on the role and evolution of institutions by aiming at combining the economist's desire for generality with the concern for the precise context in which economic players act that characterise historians and other social scientists. This middle road between pure empiricism and disincarnate theory might perhaps open the door to a better economic theory. This will enable economists to interpret current economic issues in the light of the past and, in so doing, understand more deeply the historical working of economies and societies. This is the path to offering better policy advice for today.

The contents

When putting together a handbook such as this one, the most difficult question is what to include. The possibilities were endless, but the space was limited. Topics that are not included are not by any means considered to be lacking in importance or historical significance. We simply had to make difficult choices, and in the end we decided that variety over time, topic, and geography would be our goal. The final selection of chapters represents a sampling of the topics that cliometrics has helped to transform over the past half century. It ranges from those that have long been at the center of cliometric analysis, such as Greg Clark's chapter on the industrial revolution and Larry Neal's chapter on financial markets, to chapters on narrower topics that have been developed largely as a result of the cliometric approach, such as the age-heaping work discussed by Franziska Tollnek and Joerg Baten, and Thomas Rahlf's contribution on statistical inference. In between we have included articles by Peter Temin and Stanley Engerman, who began plying their trade when cliometrics really was the "new" way of studying economic history, and young scholars who represent the next generation of cliometricians, like Matt Jaremski and Emanuele Felice. The common link in the chapters is the focus on the contributions of cliometrics.

The Handbook of Cliometrics is a milestone in the field of historical economics and econometric history through its emphasis on the concrete contribution of cliometrics to our knowledge in economics and history. It is a work of tertiary literature. As such it contains digested knowledge in an easily accessible format. The articles are not original research or review articles, but rather an overview of the contributions of cliometrics to the topic of discussion. The articles stress the usefulness of cliometrics for economists, historians and social scientists in general. The Handbook offers a wide range of topical coverage, with each article providing an overview of the contributions of cliometrics to a particular topic.

The book is organized into seven sections, grouping the 22 contributions by general topic, starting with two chapters on the history of economic history and cliometrics. The first is Mike Haupert's brief overview of the evolution of economic history, highlighting the literature in the history of the discipline that begat cliometrics and shaped its development. Peter Temin also looks at the past to explain the present state of cliometrics and then goes further, using recent contributions to the literature to make some predictions about the future of cliometrics as a discipline, highlighting the ways in which economic history and economic development benefit from their interaction. Both of these articles emphasize the growth of the influence of cliometrics on the field of economic history.

The second section focuses on human capital, beginning with broad topical coverage by Claudia Goldin, who focuses on institutions that encourage investment in human capital. In particular, she looks at two major components of human capital: education and health. Robert Margo provides an extensive review of clio's contributions to historical labor markets, using the United States as his backdrop. Lee Craig's essay on standards of living highlights some of the lessons we have learned from merging cliometrics with the fields of demography, biology, and nutrition. This is followed by two specific surveys of the role of clio in age-heaping and church book registry. Franziska Tollnek and Joerg Baten show how age heaping has been used to shed light on topics as diverse as education, gender gaps, and cross-country differentials in long run growth. Jacob Weisdorf looks at how church book registries have been used to look at similar questions.

Section three takes the big picture into consideration with five papers on economic growth. We begin with an essay on growth theories and the contribution of cliometrics to them by Claude Diebolt and Faustine Perrin, followed by Greg Clark's look at the industrial revolution. Clark looks at the change in productivity growth rates and the impact of institutions and human capital on growth. James Foreman-Peck surveys the cliometric models used to explain the demographic transition that led to modern economic growth, and Emanuele Felice discusses historical estimates

of GDP. Finally, Markus Lampe and Paul Sharp look at the contributions of clio to international trade.

Section four focuses on financial markets. Larry Neal enumerates three reasons why cliometricians study financial markets. These include an increased appreciation for the role they play in growth and development, the availability of vast data sets, and improved analytical techniques. John James contributed an essay on payment systems, noting the similarities between their development and the evolution of economic institutions. He focused on the role of cliometrics in building applicable data sets and analyzing them in novel ways, such as network modeling. Matt Jaremski provides an exhaustive survey of empirical approaches to the study of financial panics, while Caroline Fohlin examines the role of financial systems in economic development.

In section five Jochen Streb and Stanley Engerman and Nathan Rosenberg offer two takes on the role of clio in our study of the history of innovation. Engerman and Rosenberg stress that since theoretical models cannot deal with the full complexity of the process of invention and innovation, some historical study is necessary to develop a full understanding of these processes. Streb discusses the cliometric impact on the use of patent statistics to model invention and innovation.

The section on statistics and business cycles has essays by Thomas Rahlf on statistical inference, and Terence Mills on the use of cliometrics to study trends, cycles and structural breaks. Rahlf gives a historical overview of the emergence of concepts of particular interest to cliometricians. Mills looks at the evolution of methods of calculating trends and growth rates

Finally, we turn to the role of government. Price Fishback looks at the New Deal and how its effects on the Depression have been modeled. Jari Eloranta takes a broader view of the role of government - in scope, time period, and geography, when he looks at war and the many ways it has been analyzed by economists, historians, and sociologists, among others.

We enjoyed the process of putting the handbook together. What began as an innocent query (Why isn't there a handbook of cliometrics?) grew into a final project that we are excited to share with you. The process was long and exhausting but worthwhile. The result is an assemblage of top scholars analyzing the role that cliometrics has played in the advancement of knowledge across a wide array of topics.

Shortly before the final touches were put on the handbook, we were deeply saddened by the sudden and unexpected loss of one of our contributors. John James was one of the first to finish a chapter, enthusiastically agreeing to our request and delivering his essay on payment systems a few months later. Sadly, he passed away on November 28, 2014. For all those who knew John, his enthusiasm, scholarship, and dedication to the project were predictable. His loss will be felt by all of us. In his memory, we dedicate this handbook to cliometricians everywhere.

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