

REVIEW • FORUM

Thomas K. Burch's *Model-Based Demography*¹

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Tom Burch has a lover's quarrel with demography. In his eyes, the field has a useful body of techniques designed to characterize a particular set of empirical observations. But it is deficient in theory and models, without which its status as a science suffers.

How to produce better theory and models? Burch suggests that one approach is to recognize that several classical demographic techniques can be used in broader and more imaginative ways, as effectively illustrated in one chapter on life tables and two chapters on cohort component projection. These should not be presented merely as techniques or measurement devices but should be repurposed as theoretical models that can be used to address a wide variety of issues.

Other models of demographic processes, he argues, should play a more prominent role in the field, including the exponential and logistic curves, the Lotka/Volterra predator/prey relationship, and the macro-level model underlying the "Limits to Growth" project. Model-building software should be more heavily exploited and simulation used more frequently. Hernes' model of the age-pattern of entry into first marriage receives the most ringing endorsement in the volume. One chapter is primarily devoted to it, and it makes prominent appearances in five other chapters. It is an ideal model for Burch's purposes, because it has clear-cut behavioural assumptions that can be expressed mathematically, while the resulting formula can be applied to data in order to estimate underlying parameters. An additional virtue is that it fits data well—although no better than the Coale-McNeil model, to which it is considered superior because of its somewhat stronger behavioural underpinnings.

The stable population model receives the acclaim it deserves, and the virtues of the Goodman/Keyfitz/Pullum model of kinship ties and of the Hammel/Wachter family simulation model are appropriately underscored. But in a volume entitled "Model-Based Demography," I would have expected a somewhat more complete accounting of the major models being used in demography. Any personal list of important models is necessarily arbitrary, but I would have expected discussion of the Sheps/Menken model of the interbirth interval and its powerful simplification by Bongaarts. Other valuable models that might have been cited include Schoen's increment/decrement models of marriage and divorce, Rogers' multiregional models, Vaupel's models of the age-pattern of mortality, Bayesian hierarchical models of population projection, and Lee's models of the age-pattern of consumption and production.

Burch's principal justification for making models and theory more prominent in demography is not so much to enhance its analytic capabilities as to make the field more attractive to students, while raising its scientific credentials. The principal goal is a better "presentation of self." The pedagogic goal is explicit in a three-chapter section entitled "Teaching Demography." Burch has thought a great deal about how best to present demography to undergraduates, and has many

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attractive suggestions. One that I found particularly appealing was a formal elucidation of the Easterlin/Crimmins framework for the adoption of contraception, from which many conceptual and analytic spin-offs can be developed.

In support of its assessments, the volume makes many references to epistemology and the philosophy of science. It is rare that demography is exposed to evaluative criteria emerging from those fields, and I found the encounter to be bracing and fruitful. The key distinction between logical empiricism (“empirical generalizations providing the foundation for theoretical propositions arrived at by a process of induction”) and abstract theory is stressed, with the arc of history pointing in the latter directions while demography remains unduly tied to the former.

The emphasis on the philosophy of science at times leads to an evaluation of demographers in terms of whether they themselves are good philosophers of demography. Although his enormous disciplinary contributions are recognized, Ansley Coale is chided for not being self-conscious and explicit about the methodology of demography. So Burch spends a fascinating five pages rooting out Coale’s methodological asides and characterizing the logic of his many inquiries. (In one passage that students of Coale’s may find amusing, Burch expresses frustration that Coale uses the term “idea” instead of “theory.”) Nathan Keyfitz, on the other hand, assumes an elevated status because he wrote a 1975 paper entitled “How Do We Know the Facts of Demography?” that convincingly illustrates the value of theory relative to empirical evidence. Burch notes that much of the writing about demography as a discipline has been done by Europeans and Canadians rather than the perhaps-too-practical Americans.

The reason why demography is not advancing faster as a science, in Burch’s view, is that it is not attracting people who are strong in mathematics. This diagnosis seems accurate if somewhat tautological. Better mathematical preparation among demographers would certainly increase the likelihood that formal models would develop faster and deeper. A more general statement is that a field advances most rapidly when it attracts outstanding scholars. Non-mathematical behavioural models have also been of critical importance to the field—I think especially of John Caldwell’s enormous contributions to the understanding of health transitions through close observation and creative reflection. Or consider the group of economists like Mark Rosenzweig and Jere Behrman, who have brought a more rigorous approach to identifying causal processes in demography by insisting on proper research designs for analyzing observational data.

Despite many major advances in the corpus of demography, I share Burch’s view that demography is not advancing as rapidly as it should be, or as it was two or three decades ago. External pressures probably play a role. Socially conscious scholars may be less likely to be drawn to the field because rapid population growth is no longer considered a major social threat. Fertility analyses, in particular, seem somewhat moribund, at least when China is not the setting. On the other hand, studies of population health have become more sophisticated and more prominent, as illustrated by the growing frequency of their appearance on the annual meeting programs of the Population Association of America. Firm support for such studies by the US National Institutes of Health probably contributes to this trend.

A thorough assessment of the past, present, and future of demography would be a worthwhile undertaking. Tom Burch’s lively and provocative *Model-Based Demography* provides one of the foundational documents for such an assessment.