Introduction

James J. Heckman

This special issue of the Brazilian Review of Econometrics recognizes some of the basic contributions to knowledge of Ricardo Paes de Barros. All of the authors in this volume have been influenced by him and his work, albeit in different ways. I have known Ricardo for almost 30 years, starting with his entry into the Ph.D. program in economics at the University of Chicago, continuing with his appointment as part-time Assistant Professor at Yale (when I held a position there) and continuing further with collaboration on several IADB projects with meetings held all over Latin America. On my frequent visits to Brasil, we have interacted at a variety of conferences and forums. Over the years, he has enriched the academic life of the University of Chicago through his courses, formal lectures, and his participation in a variety of seminars.

First impressions can be deceptive. In the case of Ricardo Paes de Barros, they are not. Any new acquaintance rapidly learns his intelligence, his sincerity, his clarity of mind, and his sense of purpose. Ricardo is a very serious person who has devoted the whole of his adult life to understanding the problems of poverty and inequality in Brasil and to evaluating public policies to alleviate those problems. One of his major contributions has been promoting evidence-based public policy to elevate the level of policy discourse away from polarizing rhetorical arguments based on ideology and a priori ideas toward politically neutral dispassionate readings of the evidence.

I have witnessed this transformation first hand. When I first went to conferences in Brasil in the late 1970s, most of the policy discussion was conducted in terms of ideology and appeals to the teachings of such authorities as Marx, Keynes, Hayek, and Friedman. The quality of the available empirical data base was low. The more empirically inclined economists would make policy based on casual “back of the envelope” calculations using crude aggregate statistics.

Through his quiet, but forceful, influence, Ricardo revolutionized Brasilian policy making by creating and organizing a rigorous micro data base that enabled Brasilian policy makers to understand the causes of poverty and inequality and effective approaches for alleviating them. He cultivated and conducted rigorous microdata evaluations of policy that allowed policy makers to move beyond rhetoric to create a factual base for analyzing policy problems. By creating a culture of evaluation — of evidence-based policy analysis — Barros has forever changed the dialogue of Brasilian public policy.

Barros could easily have taken a different trajectory. He and Bo Honoré were students together at Chicago in the mid-1980s. I was convinced in my early acquaintance with them that both would be world class econometric theorists. Each
James J. Heckman

had strong training in mathematics and statistics before they came to Chicago. Each devoured the material I presented on nonlinear econometrics, which drew on preliminary notes for Amemiya’s *Advanced Econometrics*. Both wrote first-rate, highly creative, Ph.D. dissertations that contained fundamentally new ideas.

Bo Honoré went on to become a leading econometric theorist. Ricardo Barros could also have become a leading econometric theorist had he chosen to do so. I still learn a lot each time I interact with him on any topic in theoretical or applied econometrics.

In the words of Robert Frost, Barros “took the path less traveled by, and that has made all the difference.” 1 He never published the two brilliant essays that constituted his thesis, the extension of his first essay that he wrote as an assistant professor at Yale, or his insightful paper on testing for market segmentation using data on wages. This special issue rectifies this oversight.

In his quest to shape a culture of evidence-based policy in Brasil, Ricardo developed a unique style of presentation that emphasizes clarity and rigor. He is not concerned with publication in mainstream academic journals. Many of his papers are in Portuguese and are very applied. He is more concerned with investigating poverty and alleviating it than he is with academic honors or citation counts.

Despite this, he has received numerous honors in Brasil, as his attached vitae attests. However, his influence on worldwide scholarship is less than it should be. For example, his paper on income inequality (Barros and dos Reis, 1991) created a framework that was subsequently independently developed in later influential work in the U.S. Many of Barros’ papers contain deep insights.

Barros influenced the evolution of evidence-based policy-making throughout the entire Latin American region and not just in Brasil. He traveled tirelessly and gave courses and consultations in numerous countries throughout the region, showing by example how to create and analyze microdata bases that inform policy. Last Winter, while attending a debate on policy at the University de los Andes in Bogota, I felt the long reach of Ricardo Barros. The debate on educational policy was strongly rooted in facts and not on ideology or appeals to authority.

Barros’ work has a universal appeal that can be understood by scholars and politicians alike. As an example, a paper he recently gave at the University of Chicago on the causes of the recent decrease in Brasil’s inequality, was well received by a group of tough-minded academics. After the presentation, Ricardo casually announced he had presented the same paper to Brasil’s new president and that she had understood it perfectly. That is the hallmark of the man — rigor and clarity combined.

---

1 Frost (1920).
This Issue

This special issue makes available some key papers in microeconometrics that Barros wrote as a Ph.D. student, as well as later analytical work that undergirds his work in public policy. Accompanying it are papers by his friends, students, and colleagues.

The following papers appear in this special issue:

**Article 1:**
*The Impact of Social Interventions: Nonparametric Identification from Choice-Based Samples.*
Author: Ricardo Paes de Barros (Secretaria de Assuntos Estratégicos)

**Article 2:**
*Nonparametric Estimation of Causal Effects in Observational Studies.*
Author: Ricardo Paes de Barros (SAE)

**Article 3:**
*Minimal and Maximal Just-Identified Assumptions in Nonparametric Selection Models.*
Author: Ricardo Paes de Barros (SAE)

**Article 4:**
Authors: Ricardo Paes de Barros (SAE) and Gabriel Ulyssea (University of Chicago)

**Article 5:**
*The formal-informal labor market segmentation hypothesis revisited.*
Author: Gabriel Ulyssea (University of Chicago)

**Article 6:**
*Measuring Progress toward Basic Opportunities for All.*
Authors: Ricardo Paes de Barros (SAE), José R. Molinas Vega (World Bank) and Jaime Saavedra (World Bank)

**Article 7:**
*The Assumptions Underlying Evaluation Estimators.*
Author: James Heckman (University of Chicago and American Bar Foundation)

**Article 8:**
Author: Rodrigo Pinto (University of Chicago)
Article 9:

Duration dependence and time varying variables in discrete time duration models.

Authors: Bo E. Honoré (Princeton University) and Anna Cristina D’Addio (OECD)

The first two papers come directly from his Ph.D. thesis (Barros, 1987). The first essay, “The Impact of Social Interventions: Nonparametric Identification from Choice-Based Samples,” lays out a general framework for identifying causal effects from choice-based samples that arise routinely in evaluation research. It builds on and substantially extends some work I did with Richard Robb on classes of evaluation estimators (Heckman and Robb, 1985a,b). Barros carefully distinguishes estimation from identification. He considers the crucial role of asymmetry in information between the observing economist and the actors being studied in justifying the validity of any estimator of causal effects. His concept of relevant information is used in several of my papers (with proper citation) and is used in my contribution to this special issue (see essay 7 and the references cited there). He considers broad classes of evaluation estimators and establishes conditions for their identification. He devotes particular attention to matching estimators.

The second paper in this volume, “Nonparametric Estimation of Causal Effects in Observational Studies” — and the second essay in his Ph.D. thesis — develops a class of “D” estimators that are based on taking general differences between treatments and controls. Under matching assumptions, he develops the asymptotic properties of this class of estimators. Heckman et al. (1999) extend his basic paper to panel data and related contexts.

The third essay in this volume, “Minimal and Maximal Just-Identified Assumptions in Nonparametric Selection Models,” refines and extends analysis of the first essay of his thesis by considering nonparametric identification of selection models with a primary focus on matching. He develops a general definition of identification that I have used in later work (Heckman, 2000, Heckman and Vytlacil, 2007).

The fourth essay in this volume, “On the Empirical Content of the Formal-Informal Labor Market Segmentation Hypothesis,” is a revision of his early work on this topic that is coauthored with his former student (and my current student), Gabriel Ulyssea. It uses novel arguments to consider the nonparametric identifiability of segmented market models using information on wages and individual characteristics by sector. There is a large empirical literature claiming that markets are segmented, i.e. that competitive market models cannot explain the functioning of some labor markets. Many have claimed that Brasil has a segmented labor market. Barros shows that using data on wages alone — the practice in this literature — cannot settle the issue. The two models — competitive and segmented — explain the same evidence unless arbitrary functional forms are invoked.

The fifth essay by Gabriel Ulyssea, “The formal-informal labor market seg-
mentation hypothesis revisited,” builds on the preceding article by showing that the Barros analysis holds up even when additional data on job transitions and employment transitions are available. One has to probe more deeply than has been done to date to distinguish between the competing visions of the way labor markets work.

Essay 6 by Barros, Molinas Vega, and Saavedra, “Measuring Progress toward Basic Opportunities for All,” exemplifies Barros’ clarity, originality, and interest in policy relevant empirical economic questions. In it, Barros and coauthors consider scalar measures of equality of basic measures for all. They discuss the inadequacy of previous measurement schemes. They propose a new measure and establish its properties. The clarity and rigor in addressing an important empirical problem are typical of his entire approach to the analysis of social policy.

Essay 7, “The Assumptions Underlying Evaluation Estimators,” by myself builds on Ricardo’s essays, “The Impact of Social Interventions: Nonparametric Identification from Choice-Based Samples” and “Minimal and Maximal Just-Identified Assumptions in Nonparametric Selection Models,” and organizes the modern literature on evaluation estimators using a general framework that accounts for unobservables in a variety of different ways depending on the information available to the economist. This work draws on Ricardo’s work and illustrates and extends some principles in it.

Essay 8, “Evaluation of Small-sample Compromised Randomization: Long-term Effects of Early Childhood Intervention on Health and Addictive Behavior,” is by Rodrigo Pinto. Pinto is a former Ph.D. student of mine and a postdoctoral fellow at the University of Chicago. Under matching assumptions, Pinto develops a general set of tools for analyzing social experiments that become corrupted — as almost all do. He develops an innovative procedure for small sample inference and multiple hypothesis testing. This work is in the spirit of Barros’ essay two but relaxes his large sample assumptions and considers models with multiple outcomes.

Essay 9, “Duration dependence and time varying variables in discrete time duration models,” by D’Addio and Honoré exemplifies another strand of Barros’ work. When Ricardo and Bo Honoré were students together at Chicago, they wrote a fundamental joint paper on the identifiability of duration models (Barros and Honoré, 1988). Unfortunately, the paper seems to be lost. I refer to some key results from it in Heckman (1991). The D’Addio and Honoré paper is a contribution to econometric duration analysis. It proposes a new estimator of a dynamic discrete choice model with heterogeneity in intercepts and slopes, time varying exogenous variables, and second order state dependence.
A Brief Intellectual Biography of Ricardo Barros

Barros began his undergraduate studies in 1973 at ITA (Instituto Tecnologico de Aeronautica), one of the most prestigious engineering schools in Latin America. He graduated in 1977. In 1978, he entered a master’s program in probability and statistics at IMPA (Instituto Nacional de Matemática Pura e Aplicada), a world-class institution famed for its excellence in research in pure and applied mathematics. During his second year at IMPA (in 1979), Barros started working as a permanent researcher at IPEA (Instituto de Pesquisa Econômica Aplicada). In 1982 he finished his master’s degree at IMPA and, in 1983, he entered the Ph.D. program in economics at the University of Chicago, working primarily with James Heckman.

During his Ph.D. studies in economics, Barros spent an entire year taking advanced classes in the Statistics Department, which strengthened the tools he used to develop the ground-breaking work in his Ph.D. thesis. Barros’ early contributions focused on the analysis of the identification problem in econometrics. He developed a framework that allows one to discuss the identification problem in full generality, although he was mostly interested in analyzing conditions for non-parametric identification. This work appears in the first and third articles of this special issue and is discussed in Heckman’s contribution as well.

After finishing his Ph.D. in 1987, Barros spent an additional year at the University of Chicago as a post-doctoral fellow. In 1989, he followed Heckman to Yale and spent a year at the economics department as a post-doctoral fellow. From 1990 through 1996 he had part-time positions as a visiting assistant professor at the Economic Growth Center at Yale University, as a professor teaching at PUC-Rio (Pontificia Universidade Catolica do Rio de Janeiro), and working as a leading researcher at IPEA. At IPEA he developed an extensive body of empirical research on income inequality and poverty, the economics of education, and labor economics that would be highly influential in Brasil and throughout Latin America.

Starting in 1988, he produced important analyses of the Brasilian labor market, with special emphasis on the informal sector and labor market segmentation. His rigorous analysis of the empirical content of the formal-informal labor market segmentation hypothesis is extremely original (Barros and Ulyssea, this issue, essay 4). During this period he also started his investigation of the main determinants of income and wage inequality in Brasil, as exemplified by his highly original 1991 paper published in the Journal of Development Economics (Barros and dos Reis, 1991). More broadly, he has played a central role in disseminating, applying, and extending the tools of modern microeconometrics in Brasil. His work has set a
high standard for all that follow.

In the 1990s, Barros began to develop a methodology that characterizes much of his work on the analysis of poverty and income inequality in Brasil and Latin America. This methodology also offers a good insight into Barros’ unique analytical skills. In order to tackle an extremely complex and policy relevant topic, he developed a remarkably simple and elegant methodology, which has enormous analytical power and highlights the relevant economic issues involved. The simplicity of the approach also makes his work accessible to non-academic audiences and dramatically increases the appeal of his work.

His approach can be characterized as a socio-economic and demographic accounting analysis of household per capita income. His point of departure is the following identity for per capita income $Y$ at the household level: $Y = \frac{1}{N} \sum_i Y_i = \frac{N_A}{N} \left( \frac{1}{N_A} \sum_i Y_i \right) = S_A \times Y_r$, where $N$ is the total number of members in the household, $N_A$ is the number of adults, and $S_A$ is the share of adults in the family and $Y_r$ is the income per adult in the household (the assumption is that only adults have positive income). He disaggregates the term $Y_r$ into labor and non-labor income, while the former can be further separated into the employment rate $e$ (within the adults of the family) and the average wage earned: $Y = S_A \times (Y_o + e \times W)$, where $Y_o$ denotes the average non-labor income per adult, $e$ denotes the employment rate and $W$ the average wage per adult in the household.

Using this very simple decomposition and a very elegant statistical argument, he is able to express the distribution of $Y$ as a function of the marginal distributions of the determinants highlighted in the previously stated identity, plus what he calls association functions, which are the associated Copulas. With this framework, Barros is able to quantify the contribution of the changes on the distributions of each determinant during a given period of time by performing counterfactual analysis from the baseline to the final year of the analysis.

Barros has never limited himself to conducting decomposition analyses of aggregates. He extensively investigates each of these individual determinants of the identity, such as educational quality in Brasil, health outcomes, and demography.

As a reflection of his leadership in these fields, he was nominated Director of Social Studies at IPEA, a position he occupied from 1999 until 2004. In 2004 he became the Coordinator of Public Policies Evaluation Studies, also at IPEA. The latter position reflects his prominence in the field of policy evaluation in Brasil. Not only has he conducted several impact evaluation studies of different types of policies (job training programs, minimum wage, conditional cash transfers and literacy programs, just to name a few), but he has also created a program to train government officials and technocrats to become consumers of the products of high-level public policy evaluations. This activity is also representative of Barros’ concern in having a direct impact on the improvement of (social) policy making in Brasil and Latin America more generally.
Related to this last point, he has also made a substantial effort in systematizing the use and analysis of Latin American household surveys. His team has processed most of the available household surveys and created comparable measures of per capita income, poverty and inequality. Moreover, his team has also developed Stata toolkits that are available to anyone.\(^5\) They have directly trained several government’s analysts in Honduras to use some core statistical methods to analyze poverty and income inequality using household survey data. More recently, he led a large project (sponsored by the World Bank) that develops a methodology to measure inequality of opportunities in Latin American countries.\(^6\)

Barros’ career reflects how deeply committed he has been to research on the fundamental problems of development and the quest for deeper understanding of some of the most substantial economic problems of developing countries. He has been pursuing the same research agenda for more than 20 years, developing new methods when necessary to increase understanding of relevant policy problems. All of his work has been devoted to answering one big question: what are the determinants of the observed inequality of outcomes in developing countries?

This question has led him to study labor market functioning, the determinants of educational outcomes, inequality of opportunities, the role of family, health and demography and, more recently, the determinants of early childhood development. On the latter, he has conducted a field experiment to assess the impact of early daycare on different dimensions of child development. This research will contribute to our knowledge about the impact of such interventions. This work reflects his lifelong commitment to understanding poverty. The evolution of his work through the analysis of these topics reflects his desire to go deeper into the primary layers of the causes of inequality. His approach is the antithesis of narcissistic, cute economics that skirts over, and often mischaracterizes, the economic issues addressed. A leading example of that style is the best-selling, but factually flawed, *Freakonomics* (Dubner and Levitt, 2005).

Ricardo Paes de Barros has received the highest honors that a Brasilian social scientist can attain. In 2005 he was admitted into the *Ordem Nacional do Mérito Científico* by the Ministry of Science and Technology; in 2009, he was inducted into the National Academy of Science (*Academia Brasileira de Ciências*); and, in 2011, he received the *Condecoração da Ordem do Mérito Naval*. Barros has been a close advisor on poverty and social policy to the last three presidents of Brasil, even though there were often large political differences across the regimes. His political stance exemplifies his approach to evidence-based public policy analysis. In 2011, Barros was nominated to a high-rank position in the federal government (*Secretaria de Assuntos Estratégicos*), which is directly connected to the President’s office. This high-ranking position, along with the previously mentioned honors (and this very volume), are well deserved recognitions of the crucial role he has

\(^5\)The links to the codes can be found at [http://ideas.repec.org/e/pwa88.html](http://ideas.repec.org/e/pwa88.html).

\(^6\)Barros et al. (2009).
played for more than 20 years as a researcher, as a teacher (training generations of economists), who has profoundly influenced policy making in Latin America.

References


