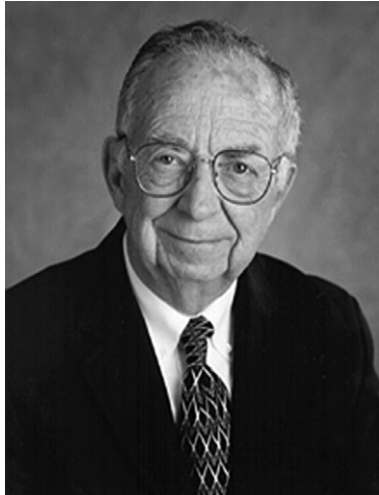


IN MEMORIAM: ROBERT SUMMERS¹
1922–2012



Robert Summers was an economist who maintained a balance between theory and applied econometrics. His association with the IARIW and the Review were in the field of international economic comparisons of purchasing power parities, output and incomes. Summers' contributions are discussed in three periods: his work prior to joining collaborative studies on international comparisons in 1970; his contributions to the United Nations' International Comparison Program (ICP) through 1980; and the development of his widely used data set, the Penn World Table or PWT.

a) EARLY CAREER

After his army service in WW II, Summers completed his undergraduate work at Reed College and with his oldest brother decided to pursue graduate work in economics. However, neither brother wanted to have an advantage because their middle brother, Paul Samuelson, was already well known in the field. So they took their mother's maiden name. Summers became a doctoral student at Stanford, attracted by the strong statistical tradition and their economists, especially Kenneth Arrow. He joined Yale as an Instructor, and there met and married Kenneth's younger sister, Anita Arrow.

¹The suggestions of Bettina Aten and Prasada Rao are very much appreciated.

Summer's dissertation had a substantive focus on the lifetime earnings profiles of a sample of income earners. However, its contribution was heavily econometric, employing what he termed a *capital intensive approach* to understanding small sample properties in simultaneous equation estimation. (Summers, 1965). By *capital intensive* Summers meant that rather than seek an analytic solution to the problem, he would employ Monte Carlo techniques to make a large number of estimates from which properties could be derived. This type of bootstrapping was quite innovative at the time.

Bob's interests often ran in non-traditional directions. With the assistance of his oldest son, Larry Summers, gathering the data, they asked the question of whether the overall winning percentage of a baseball team was statistically different depending on the team played. In baseball terms, did one team have the number of another team and win an unusually high percentage of games regardless of their record against all teams. The answer, incidentally, was no. He also looked at the trade-offs between risk and expected return in the small market for contingent remainders. When an individual is to receive a bequest contingent on say, the death of a relative, a market exists for the remainder-person to sell his right for an immediate discounted amount. (Summers, 1967).

b) THE INTERNATIONAL COMPARISON PROGRAM (ICP)

In 1970 Summers joined the Penn group under Irving Kravis that jointly produced the first three rounds of the ICP. The first ICP issue that Summers worked on was how to deal with missing prices. Within an expenditure group or basic heading like vegetables, there would be prices of lettuce, carrots, Brussels sprouts and the like, but not individual weights, and many missing observations because all countries did not price all vegetables, e.g., no Brussels sprouts in Belgium! If there were only two countries items were dropped from the comparison if there was a missing price for the item. But what about the case of more countries? Such was the case of the 1970 ICP with 10 countries and many missing prices. The solution that Summers proposed is the Country-Product Dummy or CPD method that was presented at the IAIRW meeting in Ronneby, Sweden, and later published as Summers (1973). The CPD method was a least squares regression of the log of price on two class or dummy variables, item and country. This formulation used all prices if at least one other country priced the item, provided an estimate of the purchasing power parity for a country's basic heading expenditure group even if countries did not price all items in the group. Summers also introduced methods of weighting of CPDs.

This simple yet elegant solution to missing prices is the recommended practice in the current 2011 ICP for 190 countries and continues to be applicable in a variety of formulations including its use with additional variables in hedonic form.

Summers was the econometrician of the Penn group and made a number of unique contributions to the ICP reports, including the difference between countries grouped by regions or clustered by economic characteristics. He adapted the Geary system of price and quantity comparisons to the ICP inputs of relative prices and expenditures, and estimated the differences between Geary and

other systems such as the EKS, Walsh and van Yzeren methods. In the 1975 ICP report, Summers estimated a complete linear expenditure system across countries to test its inherent plausibility and to compare the results to those of the Geary aggregation.

(c) PENN WORLD TABLE (PWT)

One standard finding in all ICP benchmarks is the Penn effect, a label brother Paul Samuelson gave to the initial ICP finding that the price level (the PPP to Exchange Rate ratio) increased with the level of per capita income. Summers pioneered different ways of expanding the ICP benchmark results to more countries. One version was a simple estimating equation with the exchange rate converted GDP as one of the variables. In Kravis, Summers and Heston (1978) this result was extended to over 100 countries.

The next step in the evolution of PWT was Bob's vision to have a table over space and time. He introduced an econometric approach that merged national accounts deflators with the implicit benchmark deflators between two ICP rounds. His term 'consistentization' did not catch on, but the problem he was tackling remains one of the main issues in ICP research today.

PWT was strongly supported by Nancy and Richard Ruggles, who were the IARIW at the time. The tables were initially in printed format and then with RIW blessing were later disseminated on floppy diskettes with Summers and Heston (1988) before they went digital in Summers and Heston (1991). This along with the boom in the empirical growth literature helped increase the use of PWT in academic research and for class assignments in trade, development and econometrics courses. Search engines now generate over four million hits a year, with a million pages downloaded and 10 to 15 thousand unique visitors a month, with seasonal fluctuations reflecting term paper deadlines. Summers was a Fellow of the Econometric Society, and in 1998 was named a Distinguished Fellow by the American Economic Association for his work on the ICP and PWT. PWT 7.1 is the last version produced at Penn. It will now be the joint project of Robert Feenstra at the University of California at Davis and Marcel Timmer and Robert Inklaar at the University of Groningen. The continuation of PWT is a fitting tribute to Bob's career.

Summers was devoted to his family, a good citizen of the University and his community, and a person of great personal integrity. His life was a wonderful balance of scholarship, civic responsibility and warm personal relationships.

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