

Lucas Miracles (Iván Werning, May 18th, 2023)

In macroeconomics, there is a before and after Robert E. Lucas, Jr.

How can Lucas's contribution be summarized? If you're reading this, you probably know that Lucas led the "revolution" of Rational Expectations in macro during the 70s. One version says this: Lucas understood the importance of two papers by John F. Muth and transported and adapted them to the terrain of macro.

This is wrong. The "Muth → Macro" view is inaccurate. In Lucas's case, Rational Expectations were almost a corollary (certainly important) of a relentless conviction to refound macro on the General Equilibrium (GE) theory of Arrow-Debreu. How can we fit macro under the micro paradigm of GE? In two ways: by compressing macro to fit into what already exists, and stretching GE theory to make more room.

To me, this vision explains the comparative advantage that Lucas had over his contemporaries. It's what made his series of papers feel like a "revolution" at breakneck speed. With it, he left us a lesson that transcends his particular ideas or models of money, expectations, and non-neutrality.

Indeed, Lucas's secret weapon was understanding that the GE apparatus was much more flexible than believed at the time. Instead of a static world trapped in an Edgeworth box, Lucas saw the arrow of time given by Arrow-Debreu to model dynamic adjustments and shocks. With a little more effort, one can include frictions to labor mobility to, for example, conceptualize unemployment (as Lucas did with Prescott). From this GE vantage point, rational expectations were implicitly already adopted in a famous article by Kenneth Arrow from 1958 (translated in 1964), where agents trade in financial assets, but have the correct expectations about future spot prices conditional on the realized state of nature.

Thus, Lucas was a visionary not for importing rational expectations into already known macro areas, but for understanding that GE theory was the basis for completely refounding macroeconomics. And from those heights one can see many new territories to explore and conquer. By no means was he alone (many others were pushing in this direction, like Phelps), but Lucas was at the forefront of this intellectual wave. He was its most fervent and clear exponent. His style was also more polished: instead of bringing a bit of GE to macro, as was customary (e.g., Tobin), Lucas tore everything down and started from scratch with a simple GE framework, completely coherent and unified.

Lucas also expanded GE theory to fit more macro into it. Following the line of Phelps, Clower, Sidrauski, Patinkin, he introduced money and imperfect information and formalized the idea of economic policy in these models. Without going into details, this includes some of his best-known papers: such as the islands of 1972 or his "econometric" critique of 1976.

It is easy to forget that, to forge this path, Lucas had to fight along the way. Today it is easy to appreciate these insights, but I don't think it was easy back then, to go against the grain of tradition in macro in this style. It is famous that his 1972 islands paper was rejected by the AER. We owe it to Lucas that he was not discouraged, that he decided to keep his style, to move forward. But let us appreciate that he played his cards without knowing how the story would go, without knowing that Lucas would be "the great Lucas" that we know today.

Another crucial aspect of Lucas' contribution was his methodological and pedagogical side. Perhaps ultimately more influential than his papers, although often living within the papers, these offerings provided a gateway to his way of thinking. The book by Nancy Stokey with Bob Lucas (along with Ed Prescott) is already one of the classic textbooks for PhDs (on the level of Mas-Colell and a few others). Later, Lucas wrote that "my own economic instincts are so thoroughly Bellmanised that I can barely imagine this non-recursive possibility". In reality, he helped Bellmanized an entire generation!

I could continue, but I promised to limit myself to painting broad features of Lucas' style of doing economics.

Writing about growth processes in his paper titled "Making a Miracle" (1993), Lucas showed fascination with the simple yet astronomical possibilities of compound interest (growing at 7% double income every decade). Today we could say the same about everything Bob Lucas left us. By refounding macroeconomics on general equilibrium and contributing to pedagogy the way he did, Lucas did not just take a personal leap in *levels*, but instead gifted us all with a strategy for *growth* in the field. With the help of compound interest over almost six decades, Lucas performed a miracle.