Developments in the use of Mathematica for Computable General Equilibrium analysis

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The use of Computable General Equilibrium modelling in evidence-based policy requires an advanced policy making frame of reference, advanced understanding of neoclassical economics and advanced operations research capabilities. This paper examines developments in the advanced operations research capability of a modern generalised mathematical software platform. Intertemporal general equilibrium modelling has become feasible over recent decades due to the development of powerful computer software and hardware. Software for this purpose has traditionally been highly specialised in its ability to define optimisation problems, presolve, and submit the modified mathematical specification to industrial strength optimisation algorithms. In the last two years, general purpose mathematical software has achieved industrial strength. For example, Mathematica now provides interior point optimisation, a technology that has taken three decades to evolve from mathematical research into a general application. It is now possible to take advantage of the many other attributes of general purpose modelling suites, for example graphics for data visualisation that greatly enhance the execution of research and communication of results to policy makers. This paper outlines techniques for the application of Mathematica to data mining of the GTAP database and in using interior point optimisation for Computable General Equilibrium modelling.