Economic Dynamics: Two Years from Completion

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isee systems
The Economic Dynamics Collection

• Just what George has described
  • A curated collection that Jay selected of work that he had written
  • From the same Lunches, but with a twist
• The Social Dynamics collection is largely a standalone works
  • Referencing different models
    • Some pedigree, but no real dependence
• The Economic Dynamics collection centers around the National Model Project
  • Many graphs and insights were derived from that work
  • Jay wanted others to be able to replicate the results
    • But the graphs are not from any single model
  • Tried several approaches to writing this up
    • Two failed first chapters – more gracious in no

• Jay’s Request
  • Take the current model and make sure it can do these things
    • Modest, but potentially fraught, undertaking
    • ...don’t change much... but maybe add some more supply chain dynamics...
Two Steps

1. Get the national model ready
2. Collate the papers into a publishable form
The National Model was long in the making

- Jay started thinking about this around the time *Industrial Dynamics* was published
- Later he developed a significant research project at MIT
  - Lots of people worked on it over the years including Alan Graham, Peter Senge, John Sterman, Nat Mass, Jim Hines and lots more
- When I got to MIT I asked Jay to work on it
  - He said no
    - I asked again
      - He said no
        - Third time was a charm
          - Worked on equilibrium analysis
          - Lots of other people working on the model
The First Migration of the National Model

- Jay retired and stopped using his MIT office
- Moved the model from Dynamo to Vensim
  - Quite straightforward translation
  - The model does not use anything special
    - It is the only model of Jay's I know of that uses arrays
- Technical Support for Jay
  - Running on a DEC workstation
    - Windows NT on Alpha
  - Had to build the software on his computer
    - Basement office
    - Floppy disks
    - Cookies
  - Would call up with bugs
    - I would walk him through fixes

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\begin{align*}
  \text{FA} &= \text{BB} + (\text{PVQ} \times \text{SVQ} + \text{CVQ} \times (1 - \text{SVQ}) + \text{HM}) \times \text{CPA} \\
  \text{CVQ} &= \text{Initial}(\text{PVQ}) \\
  \text{PVQ} &= \text{Integ}(((1/\text{TPVQ})) \times (\text{VQ} - \text{PVQ}), \text{VQ}) \\
  \text{VQ} &= \text{TVQ} \times \text{XMQ} \\
  \text{FINANCIAL ASSETS} & \quad | \\
  \text{DOLLARS} & \quad | \\
  \text{CONSTANT VALUE OF EQUITY} & \quad | \\
  \text{PERCEIVED VALUE OF EQUITY} & \quad | \\
  \text{VALUE OF EQUITY} & \quad |
\end{align*}
\]
The Second Migration of the National Model

- Equations are still not a problem
  - Added a couple macros not in Dynamo
- Still using A, I as variable names
  - Jay’s comments are perfect as variable names
- No diagrams to be had
  - Automated stock and flow to the rescue
Still to do

- Clean up and consolidate the diagrams
  - More software improvements
- Get the model behaving
  - Have notes from 2002
- Tie the paper graphs to the model
  - May be tricky

- Then step 2
Postscript

• Jay’s running joke was that the National Model was two years from completion and had been for the last 10
  • It is still true today