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System Dynamics and Economic Modelling

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System Dynamics

- System Dynamics Models identify the relevant pieces of a system's structure and simulate the behaviour generated by that structure (Radzicki, 2009)

- Stocks, Flows, Feedback (positive-negative loops) and limiting structures (what Minsky called thwarting mechanisms)

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Positive Loops: Generate self-reinforcing behaviour

Vicious cycles are examples of positive feedback loops (Fisher's debt deflation, speculative bubbles, Kaldor-Verdoorn laws of productivity, multiplier-accelerator models)

Negative loops: Generate goal-seeking behaviour and bring about stabilizing properties – oscillations

Correcting gaps, adjusting to desired levels (output adjustment via excess demand, investment adjustment to desired investment, utilization adjustment to normal level etc.)

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- Non-linear differential equation systems with which can generate cycles, explosive and implosive behaviour, catastrophes.
- Sensitivity to initial conditions, basins of attraction, oscillatory behaviour
- Minsky models (Keen 1995, 2013, Ryoo 2010, Sordi and Vercelli 2014, Kapeller and Schutz 2012),
- Models of debt and crisis (Asada 2001, Isaac and Kim 2013),
- Hysteresis (Setterfield 2006, 2011)
- Debt-deflation processes and debt write-offs (Keen and Yilmaz, 2016)
- Goodwin cycles (Goodwin 1967, Veneziani and Mohun 2006, Grasielli et al 2011)

Keen & Yilmaz (2016)

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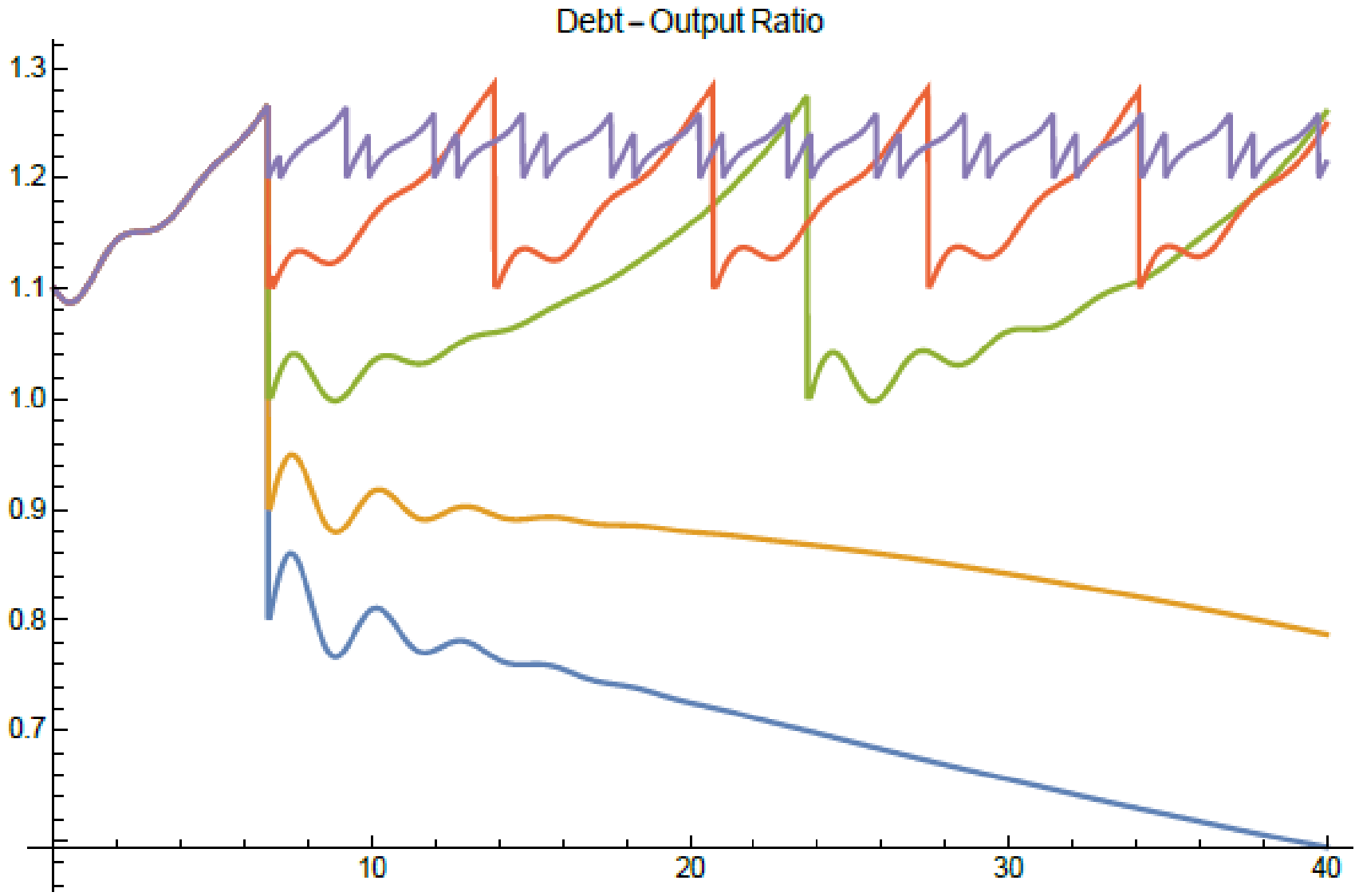

Keen & Yilmaz (2016)

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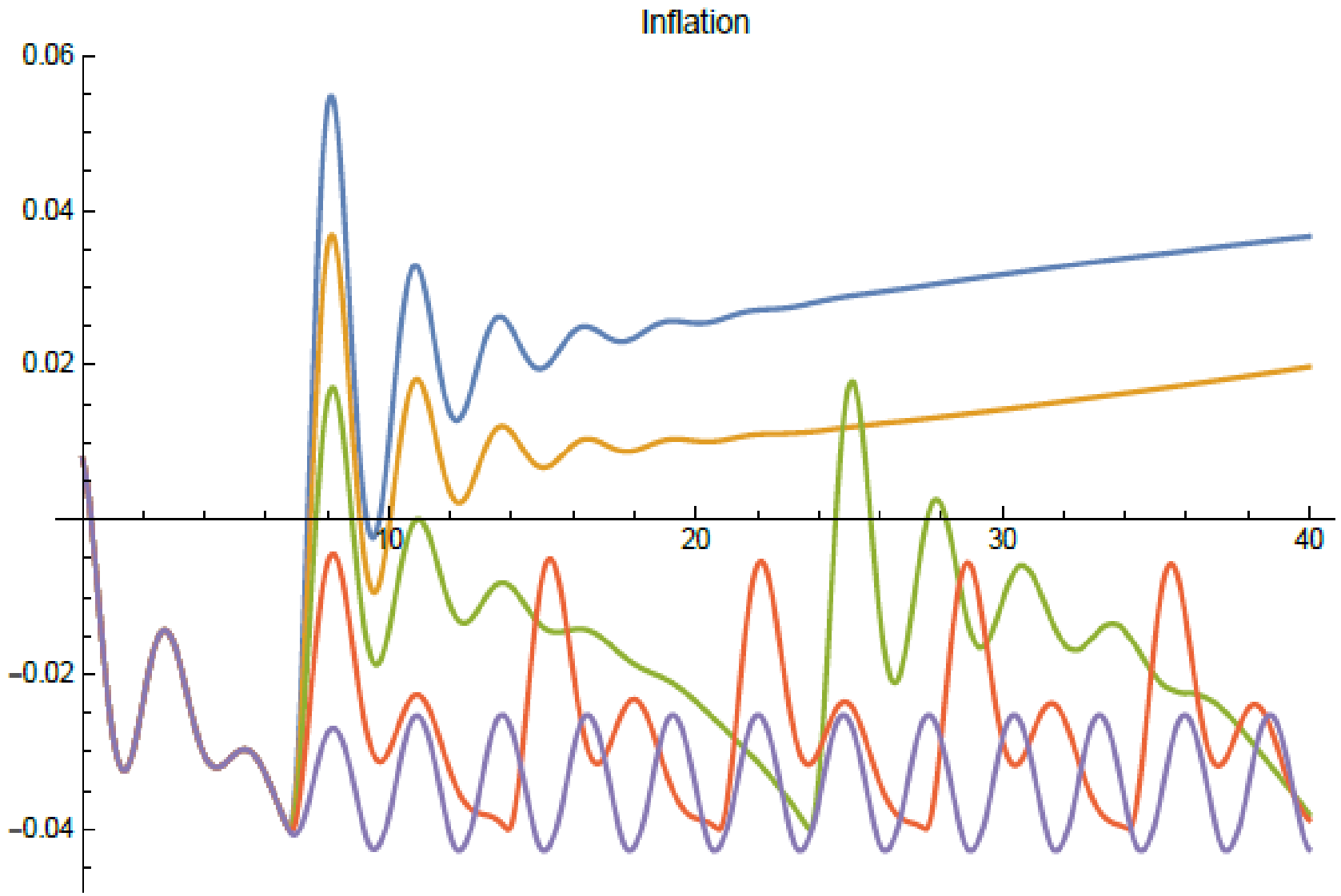

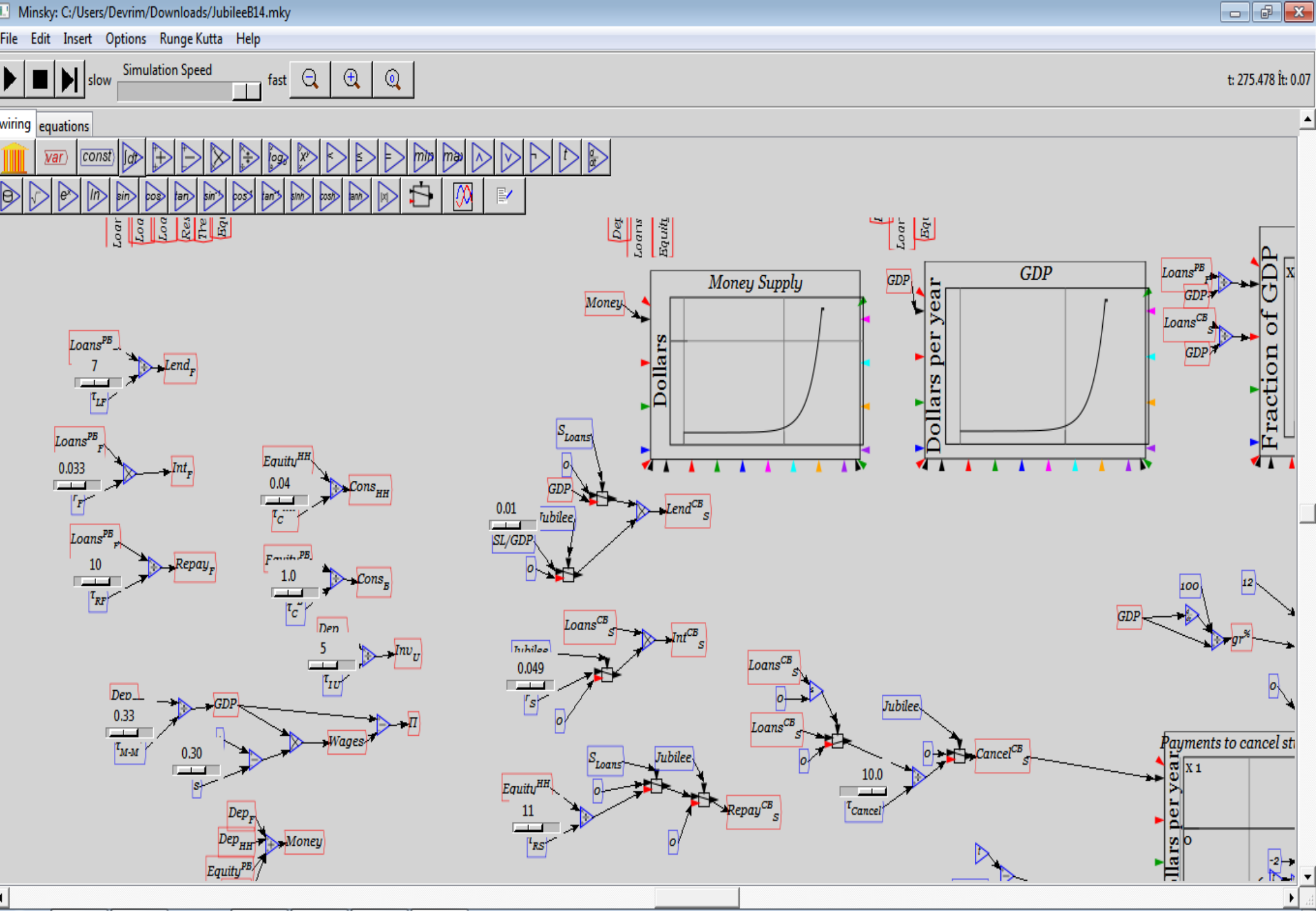
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