topic-agent-based-computational-economics-simulation-model-of-the-capitalist-business-cycle.

1 Topic: Agent Based Computational Economics simulation model of the capitalist business cycle.

Three papers:
endogenous-credit-money-from-cash-flow

1.1 1. Endogenous Credit Money from Cash Flow

Simplest abstract schematic model of typical cash flows for large numbers of **articulated, imbricated, ramified** and **layered** production units and financial institutions with choice from even larger numbers of more and less labor intensive techniques as basis for endogenous credit money.
emergent-cycles-from-disproportions-induced-by-gestation-period

1.2 2. Emergent cycles from disproportions induced by gestation period

Simplest abstract schematic model of disproportions between demand, supply and prices of commodities produced for consumption by other businesses and those for final consumption by workers and owners based on gestation lag between orders based on current prices and subsequent deliveries of products ordered with outputs from a "higher" layer not matching inputs required by a "lower" layer. Technical change to less labor intensive techniques accelerated after prices and average rate of profit crash enables initial investment to kick off the next cycle.
ramified-changing-technologies

1.3 3. Ramified Changing Technologies

Emergence of new final and intermediate products by increasingly specialized branching from existing techniques to define new techniques with cheaper inputs or superior outputs.
notes-for-paper-1

1.4 Notes for paper 1

liquidity

1.4.1 1.1 Liquidity

Initial study of practical cash flow forecasting and liquidity risk management to extract the simplest essential features necessary for a schematic model that includes endogenous credit money. Mathematical description of time series for forecasts and yield curves etc is expected to require tensors.

Starting text: Brian Coyle, "Cash Flow Forecasting and Liquidity Financial Risk Management"

1. Cashflow-Forecasting-and-Liquidity-Risk-Management-Series-.chm

Other *starting* texts: TBD from /Lehman_Bib/start/:
liquidity_risk.md Liquidity_Risk_Management/ Valuation/
and other folders and other references not yet found

2. Liquidity-Risk-Management-in-Banks-Economic-and-Regulatory-Issues.pdf

3. Modeling-Liquidity-Risk-With-Implications-for-Traditional-Market-Risk-Measurement-and-Management.pdf

4. An-Introduction-to-Banking-Liquidity-Risk-and-Asset-Liability-Management.pdf

articulation

1.4.2   1.2 Articulation

Liquidity from stocks or cash and credit provides the essential buffering and lubrication for flexible joints between articulated division of social production among autonomous units operating successive stages of production processes with inputs consumed by other producing units and final consumers purchased as outputs from other producing units and workers.

imbrication

1.4.3   1.3 Imbrication

The overlapping pattern (like feathers or roof tiles) of production, consumption, demand, supply, purchases, sales, credit and debt requires a large scale Agent Based Model to simulate the essential features that interact to produce both coherence growth with business cycles. Micro foundations of macro model by autonomous agents with actual social relations of production.

ramified

1.4.4   1.4 Ramified

The branching division of labour with larger numbers of inputs and production stages as production shifts to less labor intensive techniques needs to be included from the start even with initial choice from only a large static list of existing known technologies. This avoids creating unnecessary obstacles for later attempt at much more difficult problem of actually including unpredictable discoveries in paper 3. But also avoids getting bogged down in paper 3 before delivering papers 1 and 2.

abstraction

1.4.5   1.5 Abstraction

Capture only the essence by abstracting from everything that is not essential for producing a model with cyclic growth so as to eventually produce a working simulation model. Avoid all detail that would be needed for greater realism and actual practical models including:

1. Spatial distribution and non-homogeneity of resources, production units, transport links, workers, owners and governments. This eliminates such

issues as currencies, rent, seasonality, quality, taste, fashion, skills, experience, propensities, inheritance politics etc that are either complicated or impossible to model.

2. Historical development of social relations of production. Assume just individuals with a distribution of portfolio wealth. The distribution can change as portfolios grow and shrink but the people don't change in the initial schematic model.

3. Changing technologies. Innovation still occurs by choosing to adopt different techniques from among the large static range available depending on current and expected future prices of inputs and outputs. But we defer actual invention until paper 3.

4. Realistic production and consumption functions. Sufficient to treat final consumption like production and use simplest possible technologies that can be handled by Mixed Integer Linear Programming techniques.

This corresponds roughly to the extreme simplifications used to illustrate neoclassical fables about non-cyclic growth with only the minimum necessary additions to enable business cycles genuinely enogenous to the micro foundations rather than imposed arbitrarily and derived from finance rather than from production relations.