Prospects for Integrating Multisectoral & Monetary Models of Accumulation

James Juniper

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- 'Prospects for Integrating Multisectoral and Monetary Models of Accumulation'
  - Paper to be presented to the OPEG Workshop, 'Input-Output and Multisectoral Analysis', Walton Hall, 16-17 May, 2017.
  - Clearly, integration is both *desirable* & *challenging*
    - *Desirable*: can model/evaluate important aspects of policy agenda (Oz dual economy; ir impact on housing affordability)
    - Conditions for collapse of multi-sectoral multiplier to its one-sector counterpart unlikely to be met!
    - *Challenging*: e.g. marry Classical conception of value with SFC approach to mark-up pricing
    - Scepticism (e.g. Halevi & Varoufakis)
      - Hence, "cut corners" (hidden assumptions like equal rates of CU)
      - Yet central to understanding contemporary failures in policy
      - Do we have requisite theoretical resources (neo-Ricardian explosion in modelling of early 80's)?
      - Will focus on some neglected aspects of issue (lynch pin as central role of *money capital*)
    - Oz Context highlights these vicissitudes of policy

- The new scepticism? (Varoufakis, Halevi, Theocarakis, 2012)
  - Any system of ideas whose purpose is to describe capitalism in mathematical or engineering terms leads to inevitable logical inconsistency; an inherent error that stands between us and a decent grasp of capitalist reality. The only scientific truth about capitalism is its radical indeterminacy, a condition which makes it impossible to use science's tools (e.g. calculus and statistics) to second-guess it.
  - If a theory of value cannot be 'closed' properly (or embedded in a mathematically appropriate manner) within a theory of growth, then we have to cut corners to do it
  - The resulting models collapsed on shoals of indeterminacy forcing a choice:
    - Either accept models could not be solved; or,
    - introduce hidden (and sometimes not to hidden) assumptions that 'closed' their model at the expense of credulity e.g.
      - economy comprises a lone Robinson Crusoe-like figure
      - a single commodity
      - all exchanges occurred in a timeless universe and at a flash of a fleeting moment

- The Issue at Hand:
  - Varoufakis, Halevi, Theocarakis (2012) complain that no extant model can satisfactorily account for both determination of value and the dynamic process of accumulation
  - The one-sector mark-up pricing equation, in particular, is arguably one of weak links in the SFC modelling approach, especially:
    i. Given that issues of valuation are central to current policy debates:
       - Inflation management given cost-push, demand-pull, conflict theories of inflation
       - The role of asset-price inflation in driving consumer demand
    ii. Given early-80s work on integrating neo-Ricardian multi-sectoral models with their Keynesian macro counterparts (e.g. Jacob Schwartz, A. B. van Shenk)
       - i.e. I-O not just multi-sectoral equivalent to Keynesian-cross
       - Wright & Laibman on category error (contra Moseley?) emphasizing role of *money capital* (but must also account for role of (corporatized?) government in provision of money capital)
    iii. Given central role of *money capital* in monetary circuit (MMT + Circuitist models)

- David Laibman
  - quantification is not merely a methodological device; it is ontological, a feature of social reality itself – of both the outward, perceived experiences and the inner determinants of those experiences, related both to market forms and to other aspects of the progressive abstraction of human relations that marks the path of social development. The quantitative aspects of the objects of political-economic investigation must therefore be addressed, and gotten right, if political economy itself is to prosper and achieve its objectives. [6]
  - The burgeoning literature in Marxist economics, in the second half of the twentieth century, is filled with wordy arguments seeking profound status, as representing the most complete application of Hegelian categories to, or the most dialectically rigorous understandings of, concepts such as abstract labor, forms of value, the commodity, money, capital, etc. In some cases, the arguments amount to a denial of the quantitative dimension as such, and a tacit retreat from confrontation with the dominant ideology, and its withering critiques, on this terrain. [7]

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  - Interpretations of Marx's Value Theory
    - Temporal versus simultaneous
    - Dual system versus single system (McGlone & Kliman, 1997, Mongiovi, 2002; Mohun, 2003)
    - Hyper- versus super-integrated sectors (Wright, 2013, 2014)
 - Interpretations of Sraffa's work:
    - Special Case (linear) of General Equilibrium (Walsh & Gram, 1980)
    - Ricardian long-period (centre-of-gravity) pricing (Kurz & Salvadori)
    - Exemplary instance of the "return-to-surplus" approach advocated by Dobb (Garagnani, 2012)
 - Reconciliation with Post-Keynesian Macro
    - Kalecki's two-Departments approach
    - I-O as multisectoral version of Keynesian-Cross (Kurz, 1985; Trigg & Lee, 2005, who also confirm the relationship between Keynes's wage units and the labour theory of value)
    - Synthesis of models of Monetary Circuit with MMT via incorporation of government sector (Treasury & Central Bank)

A social accounting matrix for a 3-sector simple production economy depicted as a directed graph
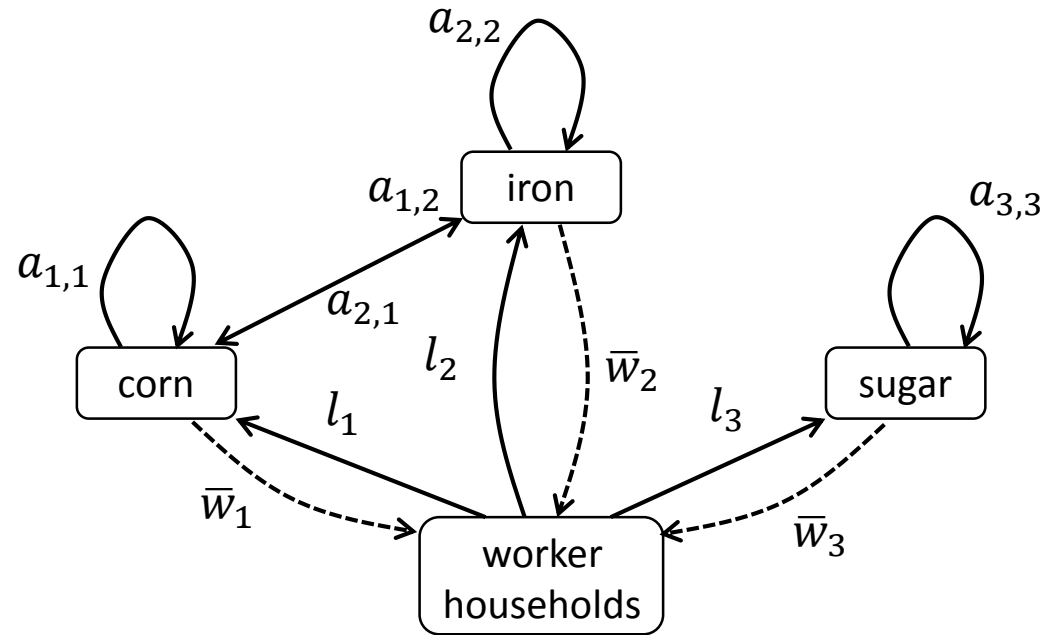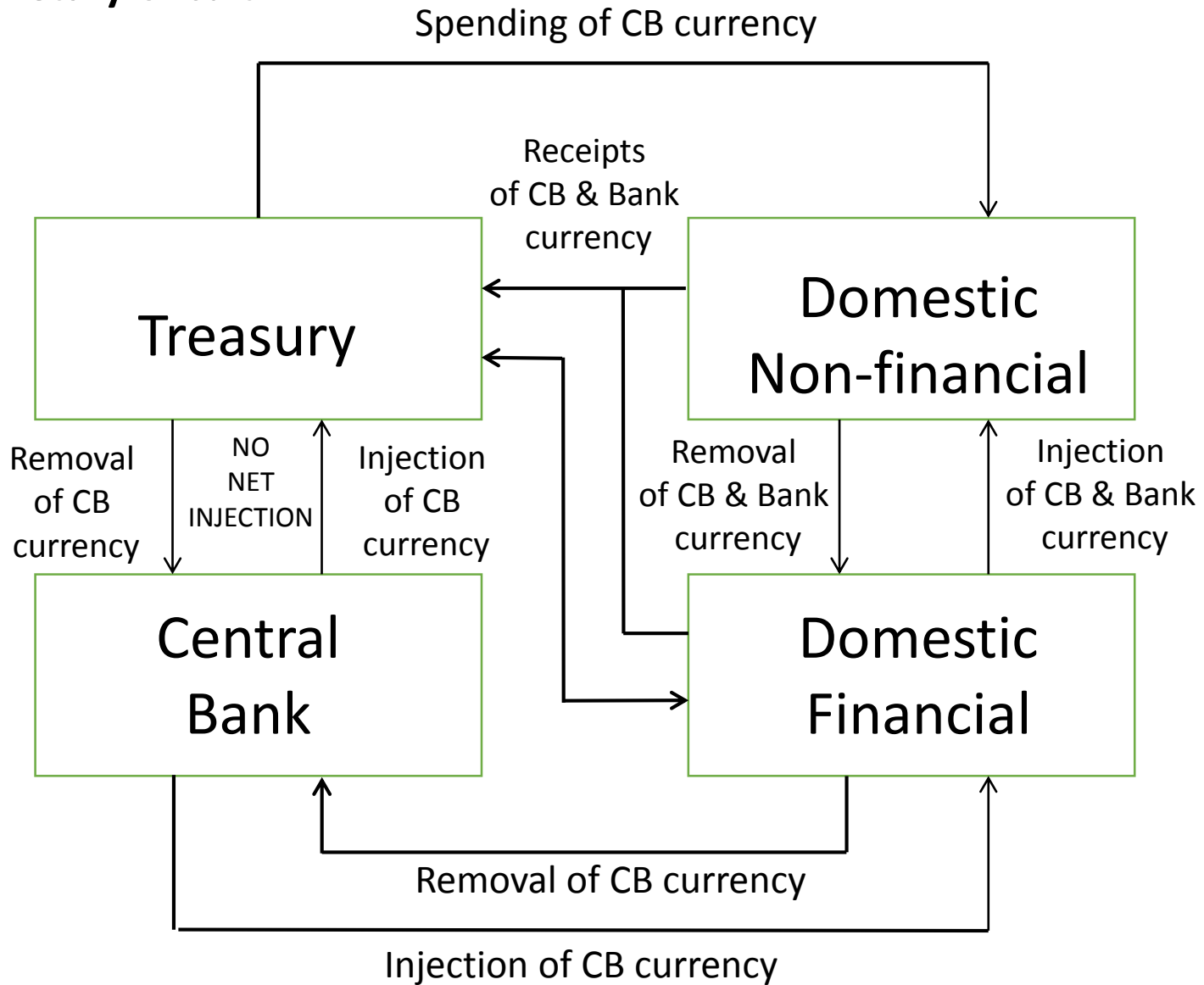

$$\begin{bmatrix} \mathbf{A} & \overline{\mathbf{w}}^{\mathrm{T}} \\ \mathbf{I} & 0 \end{bmatrix} = \begin{bmatrix} a_{1,1} & a_{1,2} & a_{1,3} & \overline{w}_1 \\ a_{2,1} & a_{2,1} & 0 & \overline{w}_2 \\ 0 & 0 & a_{3,3} & \overline{w}_3 \\ l_1 & l_2 & l_3 & 0 \end{bmatrix}$$

A social accounting matrix for a 3-sector capitalist economy depicted as a directed graph
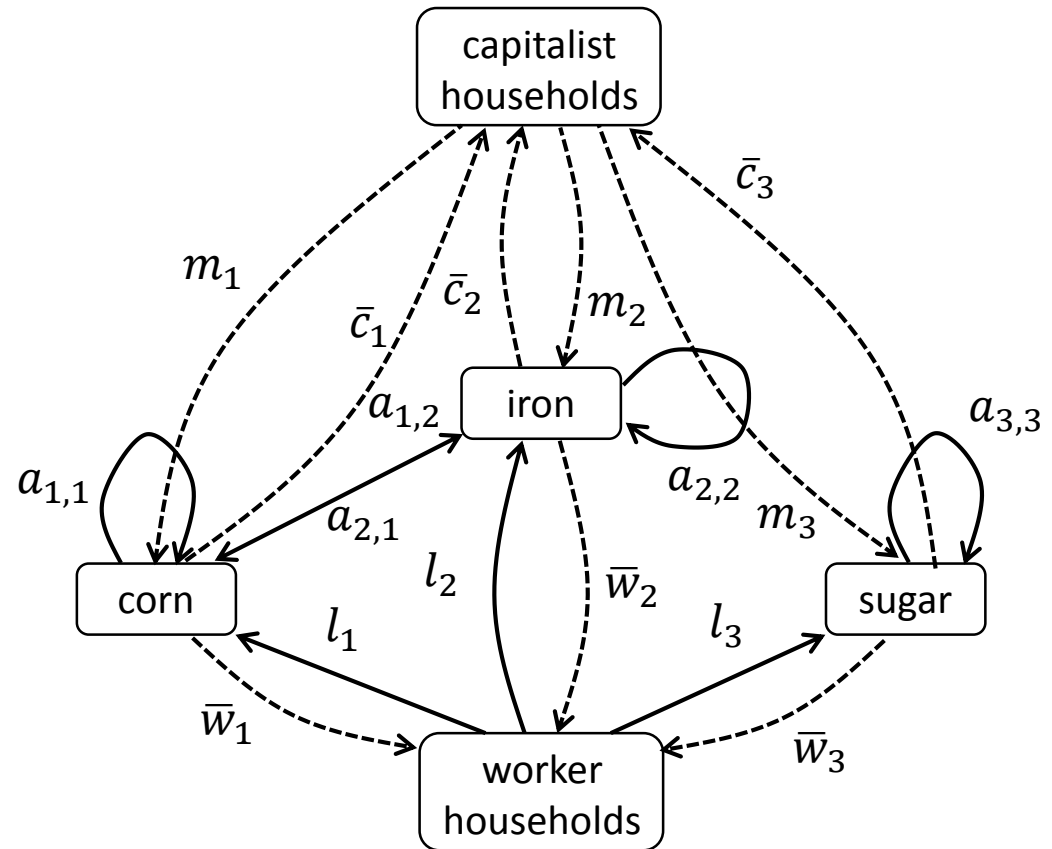
$$\begin{bmatrix} \mathbf{A} & \bar{\mathbf{w}}^{\mathbf{T}} & \bar{\mathbf{c}}^{\mathbf{T}} \\ \mathrm{l} & \mathbf{0} & \mathbf{0} \\ \mathrm{m} & \mathbf{0} & \mathbf{0} \end{bmatrix} = \begin{bmatrix} a_{1,1} & a_{1,2} & a_{1,3} & \bar{w}_1 & \bar{c}_1 \\ a_{2,1} & a_{2,2} & 0 & \bar{w}_2 & \bar{c}_2 \\ 0 & 0 & a_{3,3} & \bar{w}_3 & \bar{c}_3 \\ l_1 & l_2 & l_3 & 0 & 0 \\ m_1 & m_2 & m_3 & 0 & 0 \end{bmatrix}$$

The Monetary Circuit

Source: Tymoigne & Wray, 2013: Fig. 6 (modified.), p. 30

Duménil & Lévy: Keynesian and Marxian macroeconomics: Toward a synthesis

	SHORT RUN	LONG RUN	V. LONG RUN
DIMENSION (Macro)	Keynesian Equilibirum	Post-Keynesian Traverse	Historical RoP & Growth Rate
PROPORTION (Relative Values)	Industries of Configuration	Classical Prices of Production	Historical Input Ratios

- Capacity Utilization (V. LR, LR, SR)
- $D_{t+1} = Y_t + N_{t+1}$
- Financial savings = the difference between income and total demand (consumption and investment) = source of instability
  - Borrowing (1)
  - Paying back loans (2)
  - Depositing on bank accounts (3)
 - Using these deposits for demand (4)

- Vicissitudes of policy over last 40 plus years
  - Focus on Oz, but representative of other OECD members
    - Left have failed to explain ubiquity of move away from full employment after collapse of Bretton-Woods
  - Idealism: force of ideas
    - e.g. debates over Phillips Curve in early 70s stagflationary period
    - Mitchell (2016) 'Groupthink" wrt government as H'H, belt-tightening, neutrality of money, Ricardian equivalence under RatEXp
  - Materialism:
    - Workers weakened in class struggle in run up to demise of real existing socialism in early 80s
  - Post-Keynesian/MMT
    - Rea-wage repression (itself unexplained)
    - Turn to shareholder value (retained earnings applied to share repurchases & dividend payouts)
    - Fiscal conservatism (see above)
    - Wealth driven consumption plus asset price inflation
    - Financialisation (profit/VA share up) has reduced funding for long-term, productive investment
    - Minskyian effects (loss of diversification, deferred payback, increasing reliance on external finance)
    - Securitisation: CDOs, CDSs, role of ratings agencies, lead to destruction of underwriting system

- Hawke-Keating Government in Oz:
  - Opened doors to neoliberalism
  - Berated progressives & TUs for not 'understanding' twin-deficits hypothesis: $(G - T)\uparrow \Rightarrow CAD\uparrow$, hence, return to "stop-go" policies
  - Instead, with monetary sovereignty, can ignore CAD, & if $(T - G) \uparrow \Rightarrow$ non-Govt. Sector deficit$\uparrow$ (mainly, I - S) (i.e. fragility)
  - NB. Keating vehemently rejected John Pitchford 'soft' argument that deficit low & 60% private
- Many on left are now 'deficit-doves'
  - in sense that BoPs weaknesses used to question feasibility of full employment
- the merging of multisectoral and monetary models is both desirable and challenging. In justifying both these descriptors:
  a. I highlight problems with integrating money capital into Classical models of pricing; and,
  b. I provide an history of macroeconomic policy in Australia
- To focus, in this way, on problems associated with:
  i. the so-called "dual economy" (i.e. resource-based States and regions do well during commodity booms, but drag down the national growth rate when commodity prices start to decline)
  ii. housing and construction activity and asset-price inflation within an economy characterised by strong wealth effects on consumption.

- An integrated modelling approach: Necessity & Challenge
  - Features described above:
    - have combined to restrict options for monetary policy in Australia, especially in a neoliberal environment of fiscal conservatism
  - This is because, in this context, interest rate setting must be directed at multiple objectives:
    - control of instability in the price of goods and services *and*
    - asset prices
    - output and employment
  - Moreover, non-conventional monetary policies such as overt monetary financing or quantitative easing
    - do not help to overcome this dilemma
  - Meanwhile, the use of macro-prudential controls (e.g. to reduce investor-demand for housing)
    - has not done much to overcome the decline in housing affordability in Australia.

- SFC Modelling
  - SFC models have evolved considerably since they were first mooted by Godley and Lavoie
  - Modelling strategy brought together Kaldor-Kaleckian modelling of accumulation with Tobinesque asset demand encompassed by double-entry accounting for BS, F-O-F, & Transactions
  - Steve Keen's approach—SFC without enough behavioural equations (reflects origins in Goodwin model?)
  - Defense of CT models, yet time-delays as well as time-lags (i.e. via transfer functions) imply hybridity (integro-differential equations)
- Typical SFC components:
  - CU & Profit in Investment equation, wealth effects on consumption, accounting for financialization & securitisation
- Dos Santos & e Macedo on relation b/n SR & LR in SFC model:
  - possible to be stagnationist in SR but exhilarationist in LR (despite PS sectoral deficit & adverse consequences of financialization—myopia & fin. engineering)!
- Feasible new proxies for Minkyian instability?
  - Can't even model deferred pay-back or loss of diversification, let alone Minsky's critique of Money Management Capitalism! Passarella on change in nature of monetary circuit ⟹ proxy vars.?
  - Securitisation even harder to model effectively

- Dos Santos & Macedo e Silva (2009) Levy Ec. In. WP
  - Focus: "financialization" in SFC & Minskyian models
    - Avoid short-comings of extant literature
      - Neo-Kaleckian (B&M, 1990) Reg. Theory (Boyer, 2000)
      - Long-run as (*CONSTRUCTED!*) sequence of short-runs
    - Deploy diagrammatic reasoning based on DSZ model
      - Behavioural assumptions: (i) C dep. on level & distrib'n of income plus wealth; (ii) I dep on π & CU; (iii) $T \propto Y$; (iv) firms can finance $(I - RE)$; RatExp in SR
    - Interpretations of results depart from heterodox convention
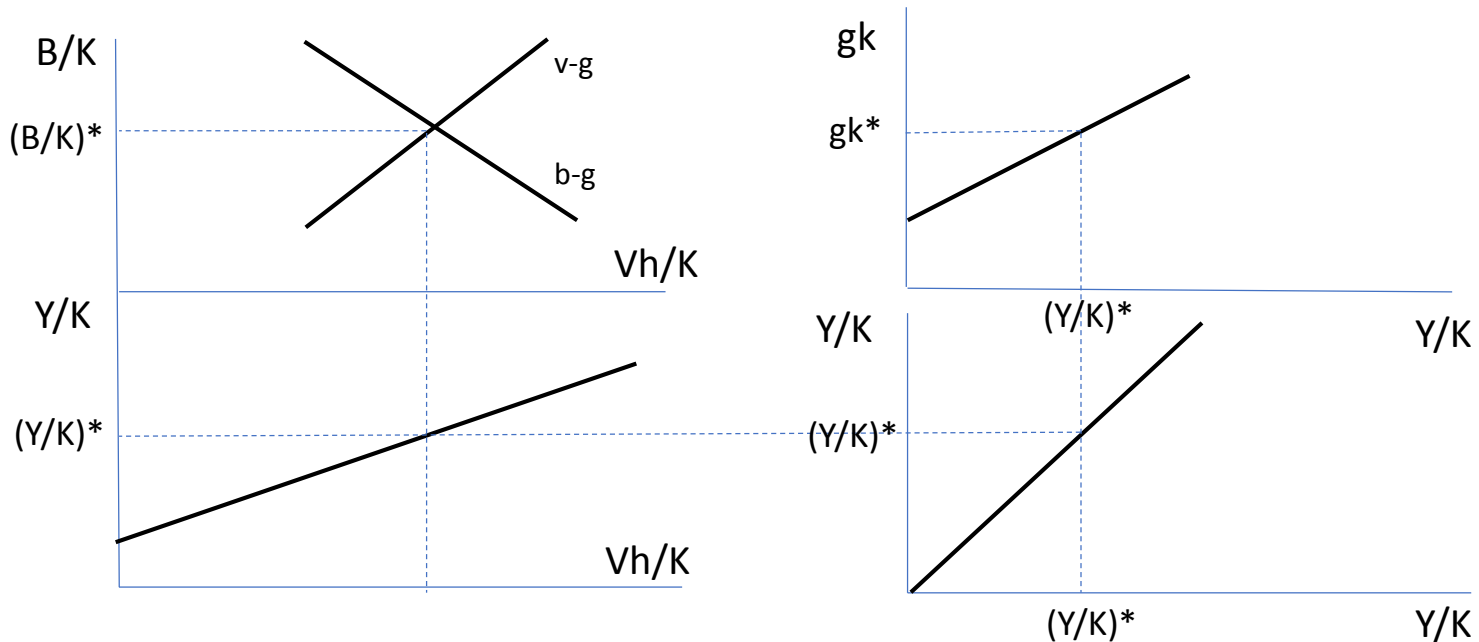
- **Extensions of the basic model:**
  - **Open economy:**
    - Monetary balance of payments models 'evolved' under RatExp to bring together PPP, covered and uncovered interest parity
    - Their poor performance led to ad-hoc modifications in accordance with notions of the "real exchange rate", which amount to form of double-dipping (i.e. PPP already incorporates the law of one price)
    - i.e. so-called "Keynesian" models (e.g. those with overshooting) allow for sticky prices in SR, with capital flows eliminating any ir differential in LR
    - Post-Keynesians emphasize the fact that
      - UIP & RIP are rejected in much of the empirical evidence
      - But PPP (absolute or relative) lacks empirical confirmation
    - In response,
      - Fama (1984) blames all on time varying risk premium
      - Cumby & Obstfeld (1984) conclude UIP & (ex-ante) PPP don't work in a world of diversified assets & commodities
      - Mishkin (1984) rejects RIP
    - Mitchell, Watts, Wray conclude that for flexible exchange rate economies:
      - ***There is no consistent evidence that fiscal deficits create catastrophic exchange rate depreciations***

- Motivating thoughts:
  - The insight of the temporal value approach, into fact that labour values can vary within period specified by the average turnover period of the production, is acknowledged
  - However, prices-of-production are interpreted as a logical rather than as an ontologically-framed or substantive conception of prices as "centres of gravity" (i.e. along the lines of a "reproduction rice")
  - Net financial asset issue by government, which can be shown to match the budget deficit, is a source of *money capital* that must be taken into account by the Laibmanians (but what is the commodity counterpart to this particular source of expenditure?)
  - But is the Mosely approach defensible? Probably, but less coherently.
  - Global turn to Neoliberal policy regime happened too fast to be explained as merely a theoretically-driven reaction to oil shocks (i.e. expectations augmented Phillips Curve)
  - The Autonomist emphasis on "general intellect" (Grundrisse) and transition from formal to real subsumption (Capital) is probably correct in seeing "precariousness" as capital's solution to problems introduced by the knowledge economy (dystopian rather than utopian vision of knowledge workers)
  - Actually achieved by abandoning full employment and embracing 'market-based' mechanisms & "entrepreneurship" (lower & less stable growth but wealthy become wealthier)
  - SFC norms imply distinction b/n SR & LR (latter as succession of SRs, but what kind?)
  - SFC Model of economy can thus be stagnationist in SR, but exhilerationist in LR! Is Australia in this basket? (Stockhammer & Onaren)

- newly developed computational approaches to modelling failed to live up to their promises
  - e.g. multi-agent modelling of along Sante Fe Institute lines,
  - John Horton Conway's notion of how agents following simple rules can give rise to complexity characterised by emerging chaos and self-organization
- Although game-theoretic approaches to computational semantics are defensible
  - And despite evolutionary models of altruistic behaviour,
- Game theory seems the last refuge of methodological individualism
  - And is unable to account in computational or cognitive terms for the evolutionary value of human consciousness and anticipatory behaviour
- Controversies in capital theory and other problems of aggregation, including
  - Sonnenschein–Mantel–Debreu theorem
  - Arrow's impossibility theorem etc.
  - Lead to a questioning the adequacy of micro-foundations
- Interesting developments coming out of computer-land?
- Coecke et al., (2014)
  - notion of a universe of processes
  - described by a mathematical theory of resources
  - e.g. . systems informed by Chemistry, thermodynamics, Shannon's theory of communication channels, and even the theory of quantum entanglement
- Application of permutation and product categories to:
  - signal flow graphs and Petri nets (Bonchi et al., 2014, and Bruni et al., 2013, respectively)
  - model hybrid systems characterised by interaction, concurrency, and decentralized control
  - But operating at a level better suited to microeconomic analysis?