

# SFC As a Unique Offering

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## This Talk

- ▶ Essentially my answers to interested, but skeptical, economists when they ask what SFC-type modeling is all about.
- ▶ Idea is to bracket both the development of the discipline with a series of common queries and rejoinders.
- ▶ It helps to think about the attributes of SFC modeling you can most easily explain and defend while explaining and defending.
- ▶ The objective is not methodological purity, nor it is conquest over the mainstream.
- ▶ The objective is to be constructive to our mainstream colleagues and useful to policy makers while retaining what is truly unique about this way of thinking.
- ▶ Thus my stance is thus unabashedly 'constructive dissent', *pace* Lavoie (1992 & 2015).

## What (for me) *is* unique about the PK way of thinking?

1. Principle of effective demand.
2. Time, dynamics, the traverse.
3. Doctrines of reasonable rationality & ontological uncertainty: agents aim to achieve certain stock-flow norms.
4. Faithfulness to the data; macro models in particular hewing closely to format & spirit of national accounts.
5. A political core of state-intervention being desirable for macro-financial stability. The economy is *not* self-adjusting.

## How are these unique elements realised in SFC and AB-SFC type models?

1. Demand-driven models integrating real markets with flow-of-fund analysis.
2. Clear recognition of interdependencies of sectors and variables. Eg, portfolio choice & household consumption.
3. Irreversible time, targets for sectors, cost-pricing.
4. Sectoral models mimicking coherence of national accounts & their adding-up constraints. Estimating these.
5. Models begin from the government, and typically end there, too.

## How is this realised in SFC models? The data

- ▶ These models began life empirically rather than theoretically, with Godley at the UK Treasury.
- ▶ Checking for flow consistency, stock consistency, and stock-flow consistency generates insights *before* you do any modeling. More on that in a minute.
- ▶ Sectoral models generate macro-financial insights (Zezza et al, 2016, Burgess et al, 2016 )
- ▶ Godley's (1999) *Seven Unsustainable Processes* as a model for PK scholarship in macroeconomics and policy.

## How is this realised in SFC models? The data, again

- ▶ The 50 year arc of Godley's argument: The macro-economy is coherent at the balance-sheet level.
- ▶ Sustained deviations in key ratios in 1 sector impact other sectors.
- ▶ In long run, these divergent processes are unsustainable. The trend reasserts itself.
- ▶ Close to being a 'mean-reverting' type of argument.
- ▶ Here we find common cause with our mainstream cousins

Finding your people.



Godley, (1999, pgs 2 & 3) writing on the US economy:

*During the past seven years a persistently restrictive fiscal policy has coincided with sluggish net export demand, so rapid growth could only come about as a result of a spectacular rise in private expenditure relative to income.*

*If . . . private expenditure at some stage reverts to its normal relationship with income, there will be, given present fiscal plans, a severe and unusually protracted recession*

# Looking at some of Godley's 1999 ratios for Denmark

Figure 8 - Real Private Expenditure and Disposable Income

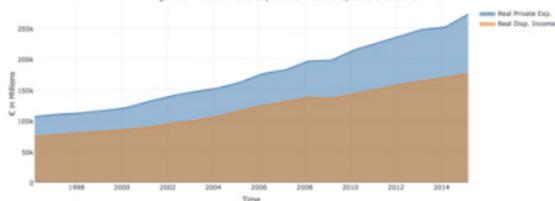
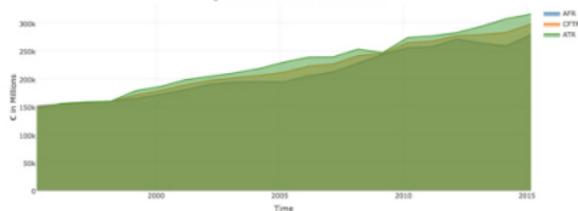


Figure 5 - Combined Fiscal-Trade Ratio



Comparison of Adjusted Fiscal Ratio

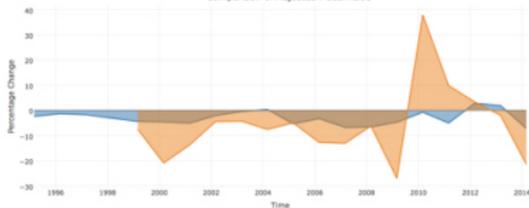


Figure 10 - Private financial balance & net lending to Priv. Sect



## An important, if slightly murky, concept: the stock flow norm

Despite a large literature, the etymology of the idea is vague. Most likely it is Godley's alone.

Eg. Leite, *Metroeconomica*, 2015 cites Godley and Lavoie, *Monetary Economics*, 2007, who cite Godley and Cripps, *Macroeconomics* 1983, who cite Roe, *Economic Journal*, 1973, who cites McKean, *Journal of Political Economy*, 1949, who is arguing for a national balance sheet to help understand liquidity problems of businesses.

## McKean, (1949)

*“In interpreting his balance sheet, the businessman uses various ratios, not just one ratio, to help gauge his liquidity position. He does not, of course, blind himself to other guides-e.g., changes in individual items, price levels, liquidity of receivables, and illiquidity of payables”*

*“During periods of contraction, alert businessmen, bankers, and investors, recognizing impaired liquidity positions due to altered collectibility of claims and renewability of debts (as well as having unfavorable anticipations), probably require higher asset-debt ratios of themselves and of those to whom they extend credit”*

*“Again the economist can follow suit. Within the nation’s economic balance sheet, several ratios can be observed-not mechanically but in the light of changes in individual items, price levels, and the moneyness of assets and liabilities.”*

## Intuition & Example

Godley and Cripps, (1983): “stock variables will not change indefinitely as ratios to related flow variables”

$$\textit{Consumption} = a * \textit{Disposable Income} + b * \textit{Wealth}.$$

Let  $c = (1 - a)/b$ . **c is a stock flow norm.**

$$\Delta \textit{Wealth} = b * (c * \textit{Disposable Income} - \textit{Yesterday's Wealth})$$

Godley and Lavoie, (2007: 74)

*“[c is] the assumed wealth to income target ratio which is implicitly imbedded into the consumption function.*

*Whenever the target level of wealth is higher than the realized level, households save, in an attempt to reach their target.”*

## Estimating $c$ using flow of funds data

Consumption  $\sim$  a. Gross Disposable Income (B6G) + b. Lagged Wealth, defined as housing (N11N) + Net financial Assets (BF90).

Take these results with a *barrel*, not a pinch, of salt.

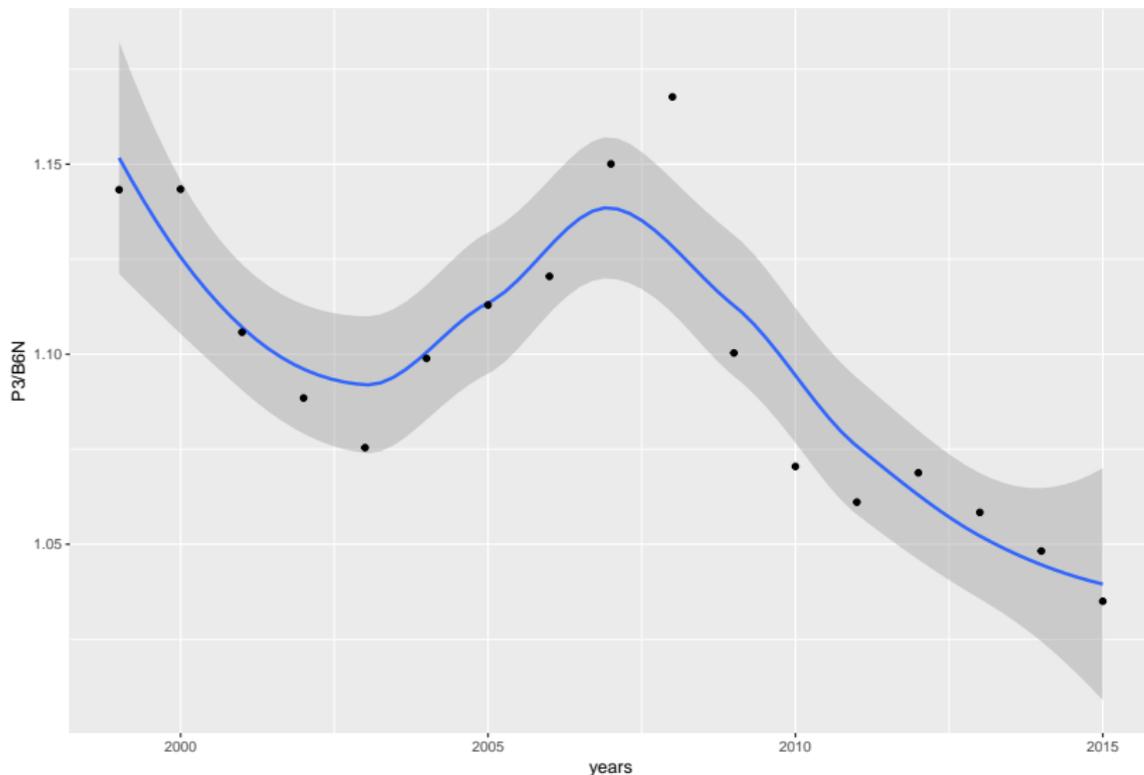
$c$  is very close to 1 for UK using data from 1995 to 2015, higher for France, lower for Germany, higher for Denmark.

## Results

	UK	DE	DK
<b>(Intercept)</b>	-27181.757 (21520.611)	-17511.699 (13769.128)	36239.279 (25086.610)
<b>B6G.UK</b>	1.004*** (0.021)		
<b>VUK</b>	0.000 (0.005)		
<b>B6G.DE</b>		0.861*** (0.010)	
<b>VDE</b>		0.001 (0.002)	
<b>B6G.DK</b>			0.923*** (0.041)
<b>VDK</b>			0.007 (0.007)
<b>N</b>	22	20	20

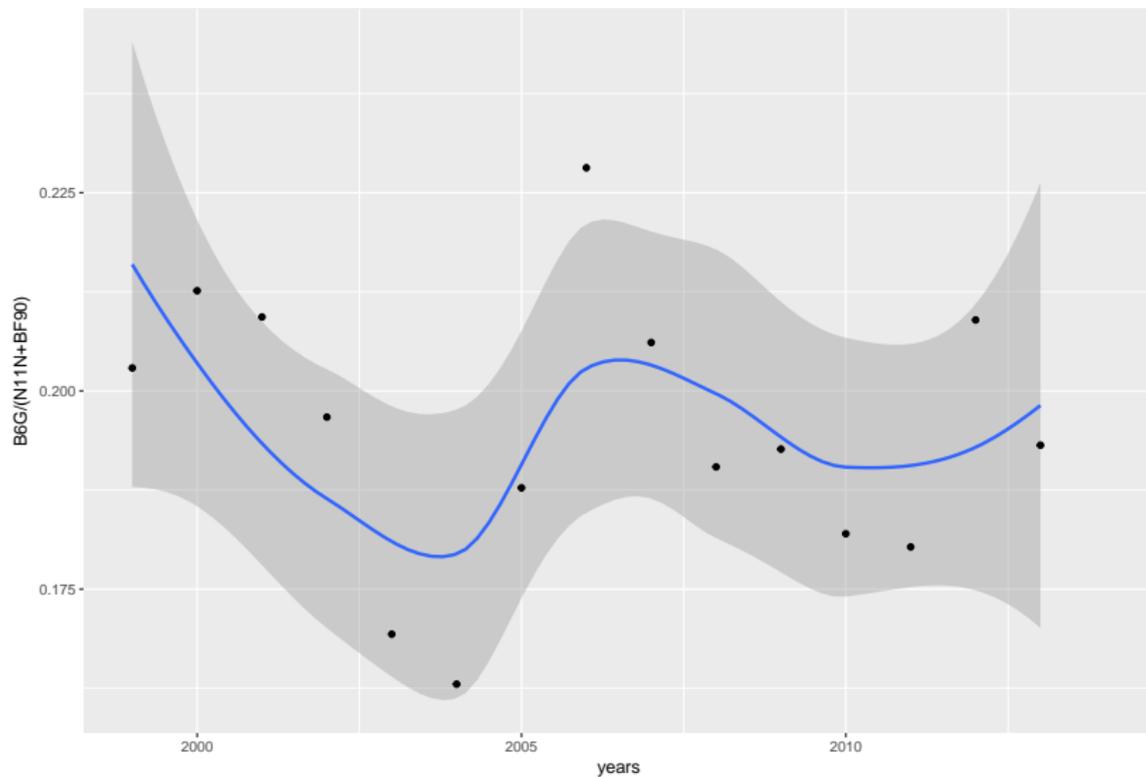
# Looking at Danish consumption data for a traverse of sorts

Denmark: Total consumption over net disposable income



# Another view

Denmark: Gross disposable income over total wealth



OK, so you're pretty good with the data. So what?

- ▶ Can show things about the economy others can't.
- ▶ This alone is hugely important for workaday central bankers and policy makers.
- ▶ Even in mainstream models, persistent disequilibria can result in large financial imbalances giving rise to Minsky-type effects. Tracking these is therefore non-trivial for policy makers.

## Ok, so aren't all macro models stock-flow consistent?

*any correctly specified closed mathematical macro model should be internally consistent and therefore stock-flow consistent. This is certainly true of DSGE models.*

- ▶ Yes but trivially and with very few financial assets or prices.
- ▶ History of economic thought (Maloney, ) suggests RBC type consistency was in fact borrowed from Godley-type models.
- ▶ Modern SFC models include Horizontal vs Vertical consistency & adding up constraints
- ▶ The primitive Walras, Taylor's (2008) critique of 'magic' ratios. (At least our magic ratios come from the data).

# OK, but we have most of the main ideas in really modern models

Nope! Consider the modeling of the following paradoxes from Lavoie (2015)

*Table 1.4 Holism: some post-Keynesian macro-paradoxes*

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Paradox of thrift (Keynes, 1936)	Higher saving rates lead to reduced output
Paradox of costs (Kalecki, 1969; Rowthorn, 1981)	Higher real wages lead to higher profit rates
Paradox of public deficits (Kalecki, 1971)	Government deficits raise private profits
Paradox of debt (Fisher, 1933; Steindl, 1952)	Efforts to de-leverage might lead to higher leverage ratios
Paradox of tranquillity (Minsky, 1975)	Stability is destabilizing
Paradox of liquidity (Dow, 1987; Nesvetailova, 2007)	New ways to create liquidity end up transforming liquid assets into illiquid ones
Paradox of risk (Wojnilower, 1980)	The availability of individual risk cover leads to more risk overall
Paradox of profit-led demand (Blecker, 1989)	Generalized wage restrictions lead to a slowdown in growth even when all economies seem to be profit-led

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## Ok, but this is just accounting, not economics

You get quite far just by getting the accounting right, but economic theory comes in in two places:

1. How you concatenate the data, what sectors you model are determined by your theoretical bias
2. How you actually specify the model for estimation/calibration/simulation.

OK, but these models have to be unstable, look at the parameters values

- ▶ A serious problem. Not one we can solve right now. Ciuffi & Rosenbaum (EJEEP, 2014) a good first try.
- ▶ Why? We are not dealing with stationary data.
- ▶ There are ways to think about econometrics with non-stationary data.

## OK, but aren't these just badly specified structural econometric models?

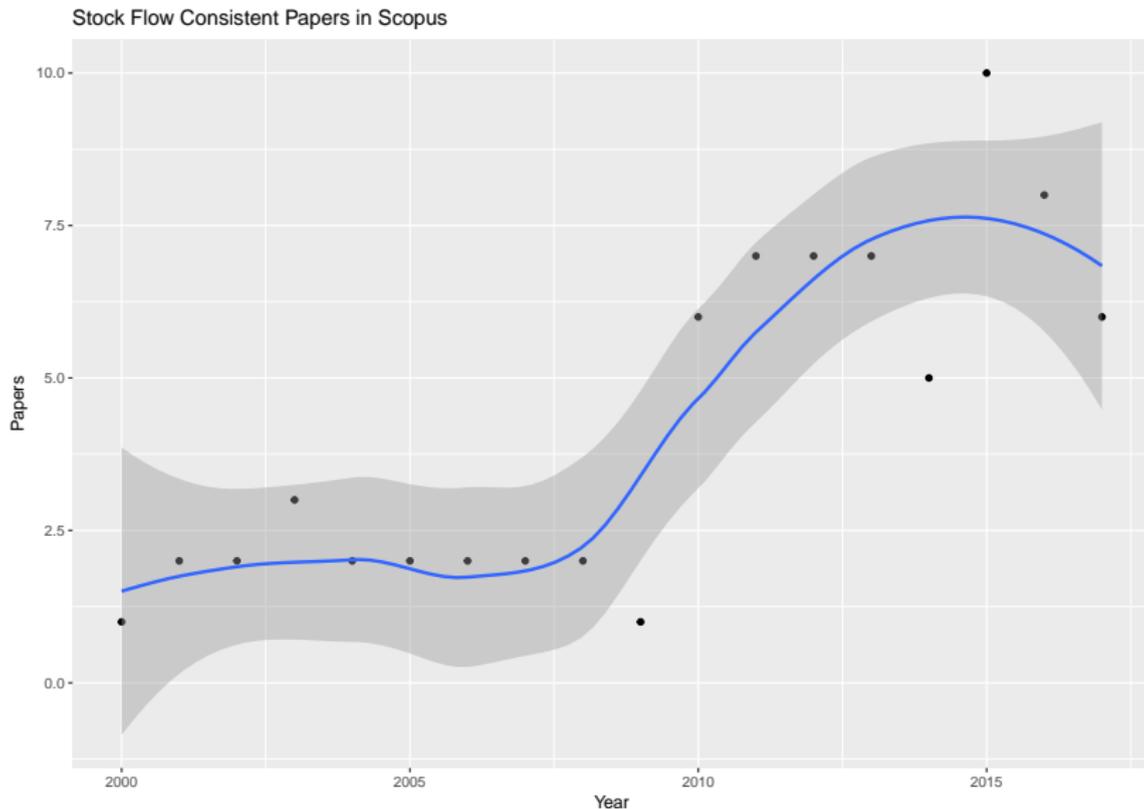
- ▶ Simon Wren Lewis and others: Burgess et al (2016) is essentially a crap structural econometric model
- ▶ The models tend to have large numbers of parameters, making them difficult to estimate other than through individual OLS regressions of behavioural relationships, thus they look 'toy like' to DSGE-type modelers.
- ▶ Movement towards more elaborate methods is essentially window dressing/virtue signalling but may help get the ideas across.

## Working in SFC 2007-2017. Large changes, topics converging to the mainstream

Set up a google scholar alert for “Stock Flow Consistent’. What topics come in?

1. Fiscal Policy, financialisation, distribution, innovation, credit creation, housing, realistic banking systems, shadow banking, monetary circuits, agent-based approaches, exchange rates, ecological economics.
2. With what methods? Estimation of reduced form models using VECM/VAR/SVAR/OLS, Simulation using R & Eviews and Runge-Kutta or other solution algorithms.

# Stock Flow Consistent Modeling Papers



## This one time, on a plane

I knocked out 20 pages of thoughts on where SFC modelling could go. It was 2011, the paper was called 'Words to the Wise'. I never got around to publishing it, but it made some vaguely strategic points. SFC in 2011 needed to:

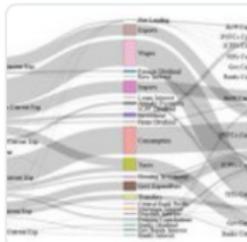
- ▶ cope with newer estimation strategies (Ciuffo & Rosenbaum, EJEPP)
- ▶ micro-foundations (agent-based, etc.) (Caiani et al, JEDC, van der Hoog et al, 2015)
- ▶ deal with model complication/complexity/stability (Mitchel et al, Metro, Dallery et al, ROPE)
- ▶ Role of prices still not well understood
- ▶ Dealing sensibly with uncertainty (Dafermos, JPKE, DeSliva & DosSantos, CJE)
- ▶ Clear policy impacts: austerity, macro prudential policy. (Papadimitriou et al, 2015)
- ▶ Connect to policy makers, show relevance (Zezza et a, Burgess et al, Fennell et al, 2015, <https://define-model.org>)

# Summary: Progress is possible



**Bank of England**  @bankofengland · 27 Oct 2016

Stock-flow consistent models: an extra tool for monetary and financial policymakers. [bankofeng.uk/D7Rt305vIKN](http://bankofeng.uk/D7Rt305vIKN) #BankUnderground



## **A dynamic model of financial balances for the Unit...**

Stephen Burgess, Oliver Burrows, Antoine Godin, Stephen Kinsella and Stephen Millard. How can large open economies deal with persistent imbalances now...

[bankunderground.co.uk](http://bankunderground.co.uk)



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That's so what.