"Circular Flow: Drawing Further Inspiration from William Harvey"

by Keith Rankin, 4 April 2012

In the 1750s Dr Francois Quesnay founded the first school of economics, known in English as the Physiocrats. Quesnay's basic model is believed to have been inspired, given his medical knowledge, from William Harvey's conclusions relating to the circular flow of blood through the body.

In the wake of Keynes' *General Theory*, representations of a circular flow of payments appear in most first year macroeconomics textbooks, enabling students to appreciate the need for balance in a closed economy while allowing for net exports as a balancing item for an open national economy. Such circular flow models are able to convey to students of economics the sense of macroeconomic equilibrium in a way that static aggregate demand - aggregate supply models cannot.

The development of circular flow modelling appears to have reached its educational apex though the hydraulic modelling process most famously attributed to Bill Phillips, the creator of Moniac. Indeed that gave rise to the concept of "hydraulic macroeconomics", as coined by Alan Coddington in 1983.

In this paper I will argue that circular flow approaches have been under-explored in economics' education, and that the resulting gap in our thinking has made it difficult for economics to adequately incorporate financial phenomena into its models. Thus, while we get financial economics as a sub-discipline in which financial assets are treated as analogues of the goods and services of 'real' economics, we fail to explore some other quite important relationships between financial behaviour and real economic phenomena.

The simple flow model presented draws its inspiration directly from the human body, or at least its upper half. It its core form, this is a closed economy model, analogous to the global economic and financial system. And, not unlike classical economics, it posits classes of households. In classical terms, we might call the two classes the 'saving class' (S) and the 'subsistence class', although for the latter I prefer the prosaic 'lower income class' (L) who essentially spend their income as they earn it. The L-class can be thought of as the labouring or working class, albeit in a modern welfare-state context.

The body's heart and lungs are analogous to the model's 'production centre' (P); firms as producers of nutrients, which are goods and services.

The head represents the saving class (S), who make the important decisions that determine the health of the system as a whole. The right hand represents government (or governments, G), and the left hand represents the lower-income non-saving classes (L).

In the body, blood cells travel from the heart, through the arteries, laden with nutrients, and return to the heart through the veins. Blood cells are the circulating medium – analogous to money – that carries goods and services from the production centre, and information to the production centre. The nutrients – simultaneously output and income – are thus distributed throughout the body, following various distributional rules; rules which include market pricing and taxation.

Nutrients flow from the production centre to the saving class (S), the low-income class (L), and to governments (G). Blood cells (money) return unladen, in the form of orders for goods and services. The system is in equilibrium when the quantity of blood cells returning to the

production centre equals the arterial outflow. Excess incoming blood places the heart under (inflationary) pressure, and a deficiency of incoming venal blood cells creates unemployment in the production centre.

In its normal state, neither G not L overspend; they live in accordance with their incomes. Equilibrium is established within the S-class, through the investment of their savings. Thus the financial system, as a system, is embodied within the S-class.

The body as a whole grows when the savings class in particular decides to acquire more nutrients in the form of capital goods and fewer as consumer goods, thereby enlarging the resource base available to the production centre.

Living standards rise when the average income of the low-income class rises, either because of general growth, or because of reduced inequality. Living standards may also rise if the normal amount of work effort required is reduced, for example as a decrease in weekly working hours. Thus the well-being of society as a whole is the well-being of the L-class.

Instability is more probable when there is an expansion of nutrients flowing as income to the saving class, because the embedded financial system has more work to do to ensure that the blood cells are returned to the heart as expenditure, given the propensity of saving class households to run financial surpluses.

The desire of the saving class to purchase capital goods is enhanced by consumption spending of the lower-income class, and by government spending. Thus, growing class inequality, understood as increased income to the S-class only, reduces the investment returns available to the saving class.

Governments will normally purchase a stable mix of capital goods and collective goods. The low income class, by definition, purchases wage goods.

Our model differs from the human body, in that it is possible for arterial blood to be channelled directly from one node to another, in the forms of transfers, credit and interest. Such inter-nodal flows represent a short-medium-term stabilisation process, when the saving class desires fewer or more goods and services than its income entitles it to.

Arterial flows from the S-class to the L-class, and from the S-class to governments (G), represent inter-class credit. G and L are debtor classes and S is the creditor class. Interest flows in reverse, from G and L to S, representing additional goods and services available to S but largely unwanted by S. Thus interest is commonly recycled back to G and L, as increased credit/debt. Inter-nodal debt repayment, like interest, is a flow of goods and services from L and G to S.

Public transfers are flows of nutrients from governments to the low-income class, whereas philanthropic transfers flow from the S-class to the L-class.

In the long-run, major corrections must take place if the inter-nodal flows of credit are persistently unidirectional. Over time nutrients flowing out of S as credit (financial surpluses) should be balanced by deficits, in which S, as a class, runs deficits (ie spends more than its nutrient income, or transfers rather than lends its surpluses to L).

The flow model outlined here offers an explanation for the global financial and economic phenomena of recent years, by emphasising the decision-making role of the saving class.
