From Macroeconomics to Monetary Economics:

Some persistent themes in the theory work of Wynne Godley

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I first met Wynne Godley in December 1999. Colin Rogers, from the University of Adelaide, was visiting Tom Rymes at the neighbouring Carleton University, and the two of them, plus my colleague Mario Seccareccia and myself, decided to set up our own regular workshop in the fall of 1999, reading and discussing recently published works in monetary economics. One of these was Wynne Godley's paper, "Money and credit in a Keynesian model of income determination", which had been published during the previous summer in the *Cambridge Journal of Economics*. Despite all of us being full professors, none of us could figure one of the equations of the paper, so I sent an email to the author, asking for some explanation. It turned out there was a small mistake in the equation. But Wynne was quite excited to see that four researchers, unrelated to him or the Levy Institute, were paying attention to his paper, so we agreed to have Wynne give a formal lecture at the University of Ottawa. Thus an error in an equation led to my first meeting with Wynne! Then, a few months later, another error, this time in a paper of mine, induced me to ask Wynne for help on a difficult accounting question. This eventually led to our collaboration on one book, one book chapter and four journal articles, as well as to an extremely large number of phone conversations and emails.

I have two regrets with regards to Wynne. Both are related to missed meetings. In the fall of 1985, during my first sabbatical, I was in Cambridge for about four weeks. Tom Rymes was there as well as a visitor, and I had a good time with other visitors, notably Peter Skott and Warren Young. I also met or met again famous post-Keynesians – Geoff Harcourt, Nicholas Kaldor, A.B. Cramp, John Eatwell. But when I suggested that I should get to talk with Wynne Godley, I was told not to waste my time meeting this "ignorant fool". Being still young and unsure of myself I did not pursue the matter any further, thus postponing my first meeting with Wynne Godley by nearly fifteen years. My second regret is another missed encounter. In the spring of 2010, I started planning

a visit to Northern Ireland, where Wynne lived with his daughter Eve and his son-in-law, getting advice from Gennaro Zezza, who had paid Wynne a visit a few months before, about how to get to the house of Wynne's daughter. I had to go to France in May and to Luxembourg in June, so hesitating a bit between the two dates, I decided to get organized to go and see Wynne in June, after my Luxembourg presentation. On May the 13th, I flew back from Paris to Canada – precisely the day that Wynne passed away. I had not seen him since May 2005, when we worked together for a week at King's college and when we both went to a post-Keynesian study group seminar, at the SOAS in London.

The reason I wanted to meet Wynne Godley in Cambridge back in 1985 is that I had read his 1983 book, written with Francis Cripps, simply called *Macroeconomics*. I had been fascinated by this highly original and ambitious work as well as the formal introduction of endogenous money through the need to accumulate inventories, but at the same time I was somewhat taken aback by its idiosyncratic presentation style and all the inflation accounting chapters. As far as I can remember, I first made a reference to this book in a survey that I made on circuit theory (Lavoie 1987), claiming that there were tight similarities between French and Italian circuit theory and the Godley and Cripps (1983) book – an assessment that turned out to be right since Wynne Godley himself became an *aficionado* and a good friend of Augusto Graziani, the leader of the Italian monetary circuit school. I also made two references to the book in my *Foundations of Post-Keynesian Economic Analysis* (1992), but I completely omitted to mention it in my survey of Cambridge views on endogenous money, prepared for the 1987 Kaldor conference in New York City and at the Levy Institute (Lavoie 1991).[1]

The present paper is in a sense a rectification of this omission. I wish to go through some of the main themes that appear in the *Macroeconomics* book of Godley and Cripps, as I see them following my experience in writing with Wynne our *Monetary*

[1] I have recently realized that when Godley (1999a, p. 396) linked up his own work to the post-Keynesian views on endogenous money in general, he did cite an article of mine among others (Lavoie 1984). For some reason, in the working paper version (Godley 1998), the reference is instead to Lavoie (1985).

Economics (2007) book. We shall see that many of these themes discussed in 1983 reappear nearly 25 years later in either the same form or in a slightly different shape. I shall restrain myself to some of the main theoretical issues that appear in these two works, omitting purposefully the more practical literature that Wynne was involved in, most notably the so-called New Cambridge hypothesis in the 1970s and the forecast of unsustainable processes in 1999 and thereafter. In what follows I shall examine three themes: Godley's big picture, his views on money and credit, and his views on pricing and profits as well as their link with inventories. These will constitute the three sections of the paper.

Despite its huge importance, both in relation to practical issues and in relation to the justification of some of the theoretical positions taken by the proponents of neo-chartalism or modern monetary theory, I will not deal with the famous fundamental identity, which Wynne has helped so much in making known, that links the accumulation of net financial assets by the private domestic sector with the government deficit and the current account balance. Neither will I deal with a theme that Wynne has defended throughout, even when it was not fashionable at all, a theme that has become of paramount importance during the current global financial crisis, that is, the dominance of fiscal policy and the relative weakness of monetary policy in depression times. Finally, another major theme will be left out, that of open-economy macroeconomics, which as Wynne said, needs to be tackled using models of closed systems (Godley 1999b).

Broad themes

The *Monetary Economics* book, published in 2007, was the arrival point of a long voyage. For a long time, Godley (1996, p. 14) had been groping "to show how the whole system fits together and cast banks in a realistic role". Already in 1993, Godley (1993, p. 79) puts forward a summary "of a substantial monograph in the course of preparation in collaboration with Ken Coutts". We are also told that there exists "a simulation model in which banks' operations are fully articulated with income, expenditure and transfer

flows together with asset demand functions" (ibid, p. 72), and that the model "has already been tested by simulation experiments" (ibid, p. 80). Thus, by then, one can say that Wynne had a fully-integrated model of the economy on his computer. But only the main equations of the model are being shown in the 1993 paper, with a steady state solution, along with justifications of the behavioural equations imposed on the various sectors – households, corporations, banks, and the government.

A full model, looking very much like the description found in the 1993 paper, with all its equations, and with a verbal description of a couple of experiments, will only be presented three years later, in Godley (1996), with the appearance, for the first time, of a full transaction flow matrix based on flow of funds at current prices. The 1996 paper does not show a balance sheet matrix however. This is surprising because a complete stock matrix had appeared ten years earlier, in the Coutts, Godley and Gudgin (1985) paper. Perhaps in part because Godley had moved out of Cambridge in 1994, working at the Levy Institute in the United States, his partner in the writing of a full monograph had changed by then, as we are also told that the 1996 paper is part of a research programme, undertaken in collaboration with George McCarthy, and that the paper "owes a special debt to Ken Coutts and Anwar Shaikh" (Godley 1996, p. 1). Indeed, it is Anwar Shaikh who brought my attention to this 1996 paper during one of his visits to Ottawa. After having read the paper, I remember telling my colleague Mario Seccareccia that this was how we ought to handle monetary economics from now on, despite being somewhat perplexed by the large number of equations.

It is only one year later, in an intermediate paper (Godley 1997), that one finds the simultaneous presence of both the balance sheet matrix and the transactions flow matrix. This is an important step, as it solidifies and provides support for the stock-flow consistent approach, that is, a macroeconomics based on comprehensive accounting and without black holes (Godley 1996, p. 7), which was already in the books when Godley and Cripps (1983, p. 44) wrote that macroeconomists ought to exploit the fact that "every money flow comes from somewhere and goes somewhere". The 1997

working paper is lesser known, but as I understand it, it gave rise to its much modified published version, the *Cambridge Journal of Economics* 1999 paper.[2] The latter paper, in my opinion, brought back Wynne Godley into the limelight among his post-Keynesian colleagues, after having been partly forgotten after the dismissal of the New Cambridge research team, when its public funding got cut off in the early 1980s. In both of the 1997 and 1999 papers, Godley says that he owes "a special debt to George McCarthy" because of his help and guidance "in all manner of ways", "through a long treck". Acknowledgements are also made in both papers to Anwar Shaikh, Robert Solow and Lance Taylor. These papers were then followed by a "Draft treatise/textbook", which was sent to a number of people in February 2000, and where McCarthy is again thanked "for extensive help with making these models at an early stage". This draft already contained, in some fairly similar form, the first four models of chapters 3 to 6 of *Monetary Economics*. Ultimately, 14 years after its first announcement, the monograph was completed![3]

My view of Wynne's theoretical work is that his work is a quest for the Holy Grail of Keynesianism. When I was a graduate student in France, Keynesians kept mentioning the need to integrate the real and the monetary sides of economics. Integration was all the talk, but little seemed to be achieved. Stinted by the rise of monetarism in the 1970s, Godley wanted to discover how money got into the economy. I understand the Godley and Cripps book as an exercise in finding some way to amalgamate the real and the financial sides. This is clearly stated in the introduction to their book, where Godley and Cripps (1983, p. 17) claim that "our present synthesis may be broadly characterized by saying that we make a 'monetarist' financial system (based on the behaviour of stocks of money, financial assets and debts) drive a 'Keynesian' flow system based on the response of expenditure to income", and it is reiterated in the epilogue, when they

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[2] The 1996, 1997 and 1999a papers all have the same structure. The 1996 paper has the most complicated balance sheet: in addition, to cash, demand deposits and time deposits, it has equities and bonds. The 1999a paper removes equities, while the 1997 paper had removed both equities and bonds thus getting rid of the difficulties associated with capital gains.

[3] I still remember the looks of puzzlement and friendly sarcasm when in 2001 I told staff members of the Levy Institute that Wynne and I were joining forces to get this book done.

claim "to have provided a framework for an orderly analysis of whole economic systems evolving through time" (ibid, p. 305). Retrospectively, it seems that it would have been better to avoid the word "monetarist", as the use of the word and that of long-run or steady state positions, plus the critiques addressed against the Keynesian orthodoxy of the time, which was said to be "incomplete and inadequate" because "it did not properly incorporate money and other financial variables", led several contemporary Keynesians to wonder whether Godley and his associates were not some kind of Cambridge Monetarists. The confusion was so great that Francis Cripps, following the presentation by Godley at the Keynes Centenary conference, felt obliged to state that "what they were doing was Keynesian monetary economics; it was not neoclassical let alone general equilibrium monetary economics" (in Worswick and Trevithick 1983, p. 176).

In their attempt to integrate the real and the monetary sides, Godley and Cripps and their colleagues "found quite early on that there was indeed something deficient in most macroeconomic models of the time", including their own, "in that they tended to ignore constraints which adjustments of money and other financial assets impose on the economic system as a whole" (Godley and Cripps 1983, p. 16). Interestingly, Godley was aware of the work being carried out at about the same time by Tobin and his Yale colleagues, as well as that of others such as Buiter, Turnovsky, and Blinder and Solow, who emphasized, as Godley and Cripps (1983, p. 18) did, that "money stocks and flows must satisfy accounting identities in individual budgets and in an economy as a whole". Still, Godley thought that their analysis was overly complicated. I also suspect that Godley and Cripps (1983, p. 15) were annoyed by several of the behavioural hypotheses found in the work of these more orthodox Keynesians, as they "could only give vague and complicated answers to simple questions like how money is created and what functions it fulfils". The Cambridge authors thus wanted to start from scratch, with their own way of integrating the real and the financial sides, thus avoiding these "tormented replies".

In line with the New Cambridge approach, Godley and Cripps (1983, p. 43) contend that stock-flow norms "are crucial to determining how actual economic systems work" and that they "exhibit a fair degree of stability". They focus their attention on two stock-flow norms: the desired inventory to sales ratio and the desired financial assets to disposable income ratio. The stability of the latter has often been questioned in the past. However, it seems that it has not been realized that this wealth to income ratio target is constant as long as one assumes a constant propensity to consume out of disposable income and a constant propensity to consume out of wealth, as most Keynesians would when constructing a model. The link between this stable stock-flow ratio and the stable propensities to consume is first made, as far as I know, in Godley (1996), and then reappears in subsequent work.

Money and banking

The big difference in the theoretical work on money conducted by Wynne Godley in the early 1980s and the mid 1990s is the explicit introduction of asset choices in his later work. In the Godley and Cripps (1983) book, portfolio choice is discussed, but it is not modelled. We are told that there must exist a hierarchy of interest rates: "bank lending rates must be higher than bond yields (otherwise banks would not want to lend to the private sector) and rates on interest-bearing bank deposits must be lower than bond yields (otherwise neither the public nor banks would want to hold bonds)" (Godley and Cripps 1983, p. 160). This hierarchy in interest rates will remain embedded in the explicit models to be built later (as in Godley 1993, p. 73).

What struck me most when I first read his 1996 paper was that Godley was putting together a monetary flow analysis, linking monetary income and expenditure with a flow demand for credit, and a portfolio analysis, that explained the various demand functions for financial assets, including the demand for a stock of money. Brought up in the tradition of the monetary circuit theory, where monetary flows and the flow demand for credit are most important and where stocks of financial assets were a side issue, I always had some difficulty in seeing how this approach could be

reconciled with the more traditional Keynesian portfolio approach based on stocks of financial assets. But Godley's 1996 paper integrated the two views, showing how flows and stocks would gradually change in line with each other through time. Godley's models could simultaneously determine the stock of money held by households and the flows of credit, investment and income. The same integration had already been achieved in the Godley and Cripps (1983) book, but the integration was only partial, the difference being that most of the book assumed that all financial assets held by households were detained in the form of bank deposits. With the introduction of the public sector, Godley and Cripps (1983) assumed that the non-bank private sector chose between government securities and bank deposits, but this choice was only described in words and not explicitly modelled.

In the French and Italian monetary circuit theory, as described earlier by Parguez (1980) and Graziani (1990), the production process starts with banks granting advances to production firms to pay for wages and intermediary products. This is initial finance. Firms are then able to pay back this initial finance as long as households don't accumulate new money balances in banks. Godley and Cripps (1983) have a similar view. For them, production takes time, and firms must borrow from banks to finance their new production. In both monetary circuit theory and the Godley and Cripps representation of the simplified circuit, the outstanding debt of firms towards banks will be equivalent to the money balances held by households. There are two innovations from Godley and Cripps (1983), compared to the monetary circuitists. The first one is that Godley shows that the outstanding debt of firms will be equal to the end-period inventories valued at cost. The second innovation is that he has an explanation of the size of the money balances. As recalled earlier, they were some stable proportion of disposable income. In his 1990s work, the proportion of money balances as a share of financial wealth was given an additional Tobinesque explanation.

As Godley points out on a number of occasions, he himself owed his formalization of portfolio choice and of the fully-consistent transactions-flow matrices

to James Tobin. Godley was most particularly influenced and stimulated by his reading of the paper by Backus et al. (1980), as he writes in Godley (1996, p. 5) and as he told me verbally several times. The discovery of the Backus et al. paper, with its large flow-of-funds matrix, was a revelation to Godley and allowed him to move forward. But as pointed out in Godley and Lavoie (2007, p. 493), despite their important similarities, there is a crucial difference in the works of Tobin and Godley devoted to the integration of the real and monetary sides. In Tobin, the focus is on one-period models, or on the adjustments from the initial towards the desired portfolio composition, for a given income level. As Randall Wray (1992, p. 86) points out, in Tobin's approach "flow variables are exogenous, so that the model focus is solely on portfolio decisions". By contrast, in Godley and Cripps and in further works, Godley is preoccupied in describing a fully explicit traverse that has all the main stock and flow variables as endogenous variables. As he himself says, "the present paper claims to have made ... a rigorous synthesis of the theory of credit and money creation with that of income determination in the (Cambridge) Keynesian tradition" (Godley 1997, p. 48). Tobin never quite succeeds in doing so, thus not truly introducing (historical) time in his analysis, in contrast to the objective of the Godley and Cripps book, as already mentioned earlier. Indeed, when he heard that Tobin had produced a new book (Tobin and Golub 1998), Godley was quite anxious for a while as he feared that Tobin would have improved upon his approach, but these fears were alleviated when he read the book and realized that there was no traverse analysis there either.

Another major difference between Tobin and Godley are their views about the role of banks. Again this is discussed in detail in Godley and Lavoie (2007, p. 497-499). Banks in most of Tobin's writings are veils that provide households with a greater variety of asset choices: "the raison d'être of Tobin's banks, so far as I can see, is to enlarge the asset choice of households and facilitate the agility with which it can be made" (Godley 1997, p. 49). By contrast, in Godley's view, banks play a distinct and essential role, since "bank loans are required to enable industry to function at all" (ibid, p. 49). Godley's banks are Kaldorian, responding to the financial needs of their credit-

worthy clients. As pointed out earlier, this is linked to his view of the production process, which as we said, is similar to that of the French and Italian monetary circuitists. Within this framework, bank loans act as a necessary buffer for the fluctuations in inventories. The link between inventories and bank loans is preserved all the way from Godley and Cripps (1983) to Godley and Lavoie (2007).

There is another feature of banking behaviour that survived the 25-year transition. Godley and Cripps (1983, p. 160) describe the mechanism through which deposit and lending rates will remain around bill rates. If the Treasury-bill rate goes up, this will induce households to acquire bills from the banks and get rid of their money deposits. But if this is the case, the deposit to loans ratio will drop down, and banks will feel that they are less liquid, holding relatively fewer of their assets in the form of safe bills. Banks will thus be induced to raise their deposit rate, so as to preserve their liquidity ratio norm, and consequently they will also raise their lending rates to maintain their profit margins. The mechanism is first formalized in Godley (1996, p. 21), and it can be found in a similar form in later works, including Godley and Lavoie (2007). It is interesting to note that Alfred Eichner (1986) had identified a very similar mechanism through his empirical work, arguing that interest rates tended to be higher when the deposit to loan ratio was high relative to its trend level, thus also arguing along the lines of some sort of bank liquidity mechanism. It is not clear that such a mechanism still exists in the real world, as banks tend to use securitization or liability management, marking up the overnight rate target of the central bank to set the prime lending rate. Unless banks desire to achieve a target deposit to loan ratio, a sudden increase in the amount of required loans will have no impact whatsoever on interest rates or interest rate differentials, a point that was made to me by John Smithin when we were together riding a cab in Berlin in 2001.

Godley was always puzzled by the standard neoclassical assumption, found in both the IS/LM model and among monetarists, of an exogenous or fixed stock of money, the worse example of which is Friedman's money helicopter drop. As Godley (1997, p. 4)

says, "governments can no more control stocks of either bank money or cash than a gardener can control the direction of a hosepipe by grabbing at the water jet". In Godley and Cripps (1983), the essentials of a monetary economy are described in any case without a government or a central bank, so that we have a pure credit economy, where private agents can only hold their wealth in the form of bank deposits. Thus, "in such a world there is only one way in which the stock of money can be changed – namely by banks increasing or decreasing the total value of their loans" (Godley and Cripps 1983, p. 76-7). Godley shows clearly that loans make deposits, but he also shows that changes in the desire to hold deposits have a feedback effect on outstanding loans. Thus, in that simple world, there can be no discrepancy between the stock of money and outstanding credit, just as there can be no discrepancy between saving and investment in the national accounts.

Also, "there cannot be any problem about equating what is usually called the 'supply' of money with the 'demand' for it. Money is created when banks make loans" (ibid, p. 82). Thus, as the circuitists would put it, "the act of money creation is also an act of expenditure and (therefore) of income creation" (ibid, p. 83). This is reiterated later in the book, even with a government sector, as Godley and Cripps (1983, p. 126) claim that there cannot be "any discrepancy between the amount of money created and the amount of money which people in some sense want to hold". Bank loans will need to increase either because firms desire to hold more inventories relative to sales and because firms expect more sales, or because households desire to increase their wealth to disposable ratio, thus desiring larger bank deposits. But this desire to save more and hence to acquire more bank deposits will generate a reduction in the sales of production firms, and hence an increase in their inventories and the amount of loans required to finance unsold stocks. Thus an exogenous increase in the demand for money will generate a concomitant increase in the supply of loans and hence in the supply of money. All these ideas are found again in chapters 7 and 9 of Godley and Lavoie (2007), where the interdependence between loans and deposits and their necessary equality is explored in a similar simplified model. In the more sophisticated model of Godley

(1999a), where banks hold several assets and liabilities, the necessary equality between bank deposits and bank loans vanishes, although their interdependence does not.

In the short period there may be a discrepancy between the stock-flow ratio targeted by firms and the wealth (bank deposits) to disposable ratio targeted by households, but the variations in output will eventually make these two ratios compatible with each other. Furthermore, at any period of time, there may be a discrepancy between the planned demand for money and the amount actually being held. But, in contrast to what several orthodox and heterodox economists have affirmed, this discrepancy is not due to some hypothetical excess supply of money that would arise as a consequence of an excessive supply of credit that would make bank deposits grow beyond the desires of households. As already pointed out by Godley (1996, p. 18), the discrepancy is caused instead by the fact that "mistaken expectations about disposable income turn up as differences in holdings of [money deposits] compared with what was targeted". Money deposits act as a buffer to absorb the consequences of these mistakes. The point is further explored in Lavoie and Godley 2001-2002, pp. 294-296). When, for instance, disposable income is underestimated, the end-of-period wealth will also be underestimated, so that the actual holdings of money will exceed the planned demand for money, hence signifying that the supply of money exceeds the planned demand for money. But this discrepancy is entirely due to mistaken expectations by deposit holders; it cannot be said to be the cause of some excess demand on the goods market. This thus vindicates Kaldor's (1982) position that there can never be an excess supply of money.

Profits and cash flows

When Godley left the Treasury and joined the Department of Applied Economics at the University of Cambridge, and when he wrote his book with Francis Cripps, the United Kingdom was facing high rates of inflation. The impact of inflation on real variables was thus of great concern to him. The Godley and Cripps (1983) book devotes several chapters to inflation processes, inflation accounting and to the conditions required to

achieve inflation neutrality, in particular the kind of fiscal stance that will keep real demand constant despite wage and price inflation. While all these issues are present in the Godley and Lavoie (2007) book, they don't resonate so hard.

Still, present in the latter book – in fact an entire chapter is solely devoted to these issues, just as it was in the earlier book – is the concern with price setting and the distinction between profits and cash flows. This distinction is all the more important when wage inflation runs high and when firms have to carry large inventories as a proportion of sales, because the value of inventories – unsold production – will be large and its increase will reduce the cash flow of firms. The distinction, as we shall see, also has a link with bank credit granted to firms and hence to the importance of truly describing a monetary economy. The interest of Godley for prices and pricing is well-known from the book that he co-authored on industrial pricing (Coutts, Godley and Nordhaus 1978). But this interest goes back further, with his first published paper in 1959, and of course also to his encounters with two figures of the Oxford Economists' Research Group on pricing, P.W.S. Andrews who was his teacher at Oxford University and Robert Hall (from Hall and Hitch) who was his senior colleague at the Treasury. Some of the discussions that slowed down the progress of our book were related to finding the best way to present pricing decisions and the various possible definitions of profits.

Godley's understanding of pricing is very close to that of Andrews and is thus one variant of the more generic full-cost pricing procedure, that is, the claim that firms set prices by adding a costing margin to some measure of unit costs. In the Godley and Cripps book, in my opinion, there are two features which obscure the presentation of pricing and income distribution. First, Godley, being used to work with statistical data provided by real statistical agencies, makes use of indices such as base-period market prices or base-period costs. The use of these indices, and the additional variables that they require, makes even harder the comprehension of ideas which are relatively difficult by themselves. It is only soon after we met that it dawned on Wynne that since

we were building theoretical models, without tackling actual statistical data, we could assume that we knew volume measures, that is, we knew how many widgets were being produced! The second obscuring feature was the lack of clarity about whether Godley and Cripps (1983, ch. 9) were dealing with ex post unit costs when discussing pricing, thus making use of identities, or whether they meant to determine prices from some behavioural equation. I dare say that this distinction is clear in the Godley and Lavoie (2007) book.

Godley's original proposition is that firms set prices on the basis of historical unit costs, that is on unit costs that take into account the fact that part of the sold goods this period will have been produced at some unit cost in the current period while the rest will have been produced in the previous period at some other unit cost, plus (unitary) interest payments arising from the cost of financing the holdings of these inventories for the period.[4] Assuming that the inventories to sales ratio is smaller than unity, this means that the proportion of goods sold but produced in the previous period is equal to the inventories to sales ratio. But this proportion cannot be known in advance, since firms do not know how many widgets they will manage to sell. The proportion used in the calculation of historical unit costs, when prices need to be set by firms before they are actually being sold, must thus be either based on an expected level of sales or be equated by convention to the normal or target inventories to sales ratio. The latter solution is closest to normal-cost pricing in the Andrews tradition, since cost is based on some normal rate of capacity utilization and on a normal level of inventories. But whatever solution is adopted, pricing based on historical costs shows that Godley was very much concerned with disequilibrium phenomena, while steady states were less interesting to him despite their apparent clear-cut appeal.

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[4] In the simplified version that appears in the main text of Godley and Cripps (1983), but not in the formal appendix, it is assumed that there is a one-period lag for all of the sales, so that everything sold this period has been produced in the previous period. Some authors make this assumption, but it leads to all sorts of problems, instability and over-determination, since present sales can be no different from past production. The flexibility provided by inventories, of which John Hicks (1989) became so much aware, also disappears.

A key feature of historical unit costs is that if unit costs this period go up by 10% after a period of steady costs, prices will increase by less than 10% in the current period. But, all else equal, by how much should they rise? Godley's answer (also found in Coutts, Godley and Nordhaus 1978) is that this depends on the normal proportion of goods sold this period that have been produced this period. This will be the complement of the normal inventories to sales ratio. So if this normal ratio is 30%, then 70% of the current 10% unit cost increase will be passed onto prices, so that prices would rise by only 7%. Godley thus argued that the time lag between costs and prices could not be just about anything. He was against the econometric determination of time lags in pricing studies. He thought that the normal or average inventories to sales ratios that could be obtained from raw data provided the necessary information.

A contentious issue, at least in the mind of Godley, was the adoption of a proper definition of profits. At least four definitions could be used. Net business profits, or what we came to call entrepreneurial profits, are simply equal to sales less actual historical costs (including required interest payments on inventories). Gross business profits, or total business profits, not unlike the famous EBITDA, are equal to sales less actual historical costs, excluding interest payments. National income and product account profits, NIPA profits, are total business profits less stock appreciation or inventory valuation adjustment (IVA), which represents the increase in the value of the opening stock of inventories. Finally, the cash flow of firms is equal to entrepreneurial profits less the change in the value of inventories, or looking at it from another angle, it is equal to sales less current costs and interest costs. Thus, the accountant may tell the business owners that they are making big-time profits when in fact the firms needs to keep borrowing just to keep afloat or to be able to distribute dividends. This will happen when changes in the value of inventories are looming, either because the number of units in inventories is quickly rising, or because the production cost of each unit of inventory is exploding, presumably due to cost and price inflation. As ironically put by Godley and Cripps (1983, p. 71): "how can the trader live? His accountant is telling him he is making a profit; but far from having money to buy bread for himself, he is out of

pocket on a substantial scale". This problem was an important one for Godley, one that starting businesses face and one that arose during the days of double-digit inflation.

Wynne Godley expressed great reluctance in accepting the definition of NIPA profits. Although he was fully aware that national accountants needed such a definition to equate the value of production to factor incomes, it took a long uphill battle to persuade him to include the NIPA definition in our book. Godley was convinced that the business definition of profits was closest to reality. He also argued that the business profits to sales ratio or, in other words, the share of profits so defined, was invariant or, it turned out, *nearly* invariant to large fluctuations in inventories and unit costs. This he found to be an interesting property, which he could link to his theory of conflicting-claims inflation. He grudgingly accepted to include the NIPA definition only when I showed him that the NIPA profits to sales ratio was *completely* invariant to fluctuations in inventories and their costs (Godley and Lavoie 2007, p. 278) – a rather surprising result.

Godley also always insisted that coherence required that inventories be valued at production cost. National accountants value everything at market prices, except government services and inventories, which are indeed valued at production cost. If the flow-of-funds matrix is to be fully consistent, the value of inventories needs to be equal to the wage costs encountered in producing the goods and initially kept as money balances by the workers, and this means that the advances provided by banks to finance the production of the good will also be equal to the value of inventories, so that the flow of bank credit will equate the flow of bank deposits. Unfortunately, when reading other contributions, I have noted time and time again that the few sophisticated models that deal with inventories do not respect this accounting constraint.

Conclusion

As all those that worked with him, I learned a great deal from my 10-year collaboration with Wynne Godley. I used to tell him that I had learned more during the six years that led to the publication of our book than during the previous twenty years of my academic

career. It was sometimes a frustrating experience, as no doubt my predecessors such as Ken Coutts and George McCarthy can attest, because Wynne could be incredibly stubborn on some issues, while changing his mind in the most fleeting way on some others, especially on matters of presentation.

One of the difficulties that we faced when writing our book was to choose our targeted audience. Eventually, after several long phone calls, we decided to seek out a post-Keynesian audience, despite the advice of a few of Wynne's friends. There was a stage where Wynne was aiming at a larger group of economists, as he was when writing his middle-term assessments of economic conjuncture. The same desire transpires in Godley and Cripps (1983, p. 305) when they say that their "logical framework is neither 'monetarist' nor 'Keynesian'; it is non-denominational both in theoretical and in political terms". Certainly the same can be said about the stock-flow consistent framework that informs Godley and Lavoie (2007). The framework, with its flow and stock matrices, can be put to use by orthodox economists. But we came to realize that post-Keynesians perhaps best needed the discipline of stock-flow consistency, and that in any case, since the rest of our message and our assumptions were essentially Keynesian, it was more realistic to presume that only fellow post-Keynesian or heterodox colleagues were likely to listen to us.

Wynne, notwithstanding some of his heterodox critics, was a true Keynesian. Godley and Cripps (1983, p. 305) conclude their book by saying that its main result is "to re-establish the quintessentially Keynesian principle of effective demand as the determinant of real output and employment". The principle of effective demand, applied both to the short period and to the long period, is in my view one of the essential two characteristics of post-Keynesian economics, the other one being a concern with the operation of economic systems through historical time, with the present dependent on the past. An analysis conducted in historical time was precisely a most fundamental concern of Wynne Godley who always wanted to track the

interdependent evolution of variables through recursive relationships and sequences (Godley 1993, p. 61), a concern that he also attributed to the older John Hicks (1989).

Wynne Godley often expressed his great admiration for several of his former colleagues, notably his former co-authors, but he had a particular appreciation for the work and ingenuity of Nicholas Kaldor. He often regretted in print (Godley 1993, p. 63; 1996, p. 3) and in conversations however that Kaldor did not bother to attempt to put all of his ideas within a comprehensive scheme.[5] Godley was no doubt a post-Keynesian of the Kaldorian variety, as exemplified by his work on money and credit, the main themes of which I have tried to develop here in the second section. I had myself high regards for the work of Kaldor, and was grateful to the fact that, unsolicited, he had offered his help following his reading of the preliminary version of a paper of mine (Lavoie 1984) at a time when I did not have tenure. Wynne and I were thus fated to get along, because we were both influenced by the monetary circuit view and concerned with pricing issues, and because my own previous work was "a mix of Kaldorian and Kaleckian economics" (Lavoie 1992, p. 4).

[5] Very few post-Keynesian authors have attempted to do so, among which most notably are Alfred Eichner and Edward Nell.

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