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Sheetal K. Chand

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02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 11

Sheetal K. Chand*

Macroeconomics – Which Way now? Old versus New Styles

This paper contrasts the new style of doing macroeconomics, where the emphasis is on propositions rigorously derived from neoclassical micro foundations, with the old style associated with the work of Keynes in particular. The paper argues that the latter type of model, which is based on more realistic albeit informal behavioural micro foundations, is better suited to the concerns of policy makers. However, emphasis on the new style has led to an abandonment of research on adapting the old paradigms to new concerns, with a consequent loss for practical policy making especially with respect to macro stabilization. A perspective on how the new style can and cannot be helpful is provided.
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Let me say at the outset how delighted I am to be sandwiched between two "New Macroeconomists" Torben Andersen and Steinar Holden, both of whose work I admire. I myself am an "old style" macroeconomist, who was brought up on Keynes's General Theory (1936), which I notice is no longer on graduate macro reading lists at prominent universities. During my years at the IMF the staple was the IMF's monetary model developed by Polak (1956), which also does not feature on these reading lists. This I find quite baffling in view of the defining contributions of these frameworks for the conduct of macroeconomic stabilization policy around the globe for more than fifty

* Department of Economics, University of Oslo, Post box 1095, Blindern, N-0317 Oslo, Norway. E-mail: s.k.chand@econ.uio.no
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02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 12

years. When I enquire why I am usually told something on the lines that they lack rigorous micro-foundations.

But is the quest for increased rigour in the form of sharply defined micro-foundations appropriate, and especially when dealing with stabilization problems in real time? I shall argue that the emphasis on this kind of rigour is misplaced. Not only does it account for much of the disconnect between current academic research on macro stabilization and the way governments and international organizations actually practice it, but it might even encourage potentially destabilizing structural reforms. While the academic research is in many respects exciting, I do not believe it has so far succeeded in developing effective substitutes for reasons I shall explain. There is, moreover, a lamentable consequence of current academic disenchantment with earlier frameworks in that it discourages research on preserving and improving them. This fate may be appropriate for large-scale Tinbergen type Keynesian models that Lucas (1976) critiqued with devastating effect, not to forget that Keynes also critiqued them, but I shall argue this is not so for the sort of models that Keynes (1936) himself espoused, or those that Frisch considered later in his career. The result of the disenchantment with the old and the lack of effective new substitutes is that practical policy making becomes increasingly ad hoc, with greater scope for confusion. This leads to inefficient economic management, which I claim is evidenced by the widespread economic crises of the past two decades around the globe, and the progressive build-up of the IMF's casualty case list. When theory does not support practical work and practical needs do not inspire theory, we are clearly at an impasse: the key issue then is how to break out of it. In my deliberately provocative remarks I will indicate some of the enduring concerns of macroeconomics, as I see them, and the extent to which the new macroeconomics does or does not address them; lament the fundamental disconnects between macro practice and current theory and suggest ways for overcoming them. Finally, I will stick my neck out and indicate, as requested by the conveners of this conference, probable outcomes of the fundamental disconnect.

What is macroeconomics about?

It is useful to begin with a reminder of the basic wants of individuals and then to examine their macroeconomic manifestations. The first column in Table 1 lists six basic individual wants that motivate individual behaviour in the economic area. These involve various aspects of income such as its amount and its purchasing power that are needed for sustained well-being. The second column identifies the macro correlates that correspond to them. Consider the first item: all individuals presumably will want jobs that will generate some income. From time to time some individuals will lose jobs and/or incomes. Is this an idiosyncratic event that washes out in the aggregate? Or is there a macroeconomic manifestation of unemployment and loss of income? If the phenomenon is macroeconomic what influences its variation? Can some form of public policy intervention ensure a more satisfactory outcome? Similar questions can be raised about each of the other items. For example, the individual would also be concerned about income retaining purchasing power. This is affected by the macroeconomic phenomena of inflation and exchange rate changes. What explains their variation, how can they be influenced? And so forth.

Answers to such questions determine whether there is anything distinctive about macroeconomics. In the Anglo-Saxon tradition, the systematic study of macroeconomics

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 13

Table 1.
Individual Wants and Their Macroeconomic Correlates

Individual wants	*Macro correlates*
• Want job/income	• Unemployment
• Want income to have purchasing power	• Inflation/exchange rate
• Want income to increase	• Productivity/growth
• Want purchasing power parity with neighbour	• Income/wealth distribution
• Want income when unable to work	• Social insurance

is generally dated from Keynes's General Theory (1936), where he argued that certain phenomena could not be handled through mere aggregation of individual behaviour and Walrasian market coordination.[1]

He questioned the relevance of classical theory both for understanding macro phenomena such as unemployment and for developing solutions. Keynes argued that interaction between agents who differed with respect to endowments, preferences, expectations, access to information, psychological states and so forth can generate purely macroeconomic problems. The market, although a wonderful mechanism, would from time to time fail to coordinate the interactions of myriads of individuals. Classical economists, who had correctly pointed out the huge benefits from social interaction and specialization, paid insufficient attention to the price tag: the individual's loss of control to macroeconomic developments. However much the individual may want job and income, and old-age insurance, macroeconomic circumstances may deny them. Frisch in the 1930's considered the case where an economic depression originated from one set of agents not daring to buy the other agents' goods, because they feared they would not be able to sell them later on (referred to in Andvig, 1988). "Involuntary unemployment" to use Keynes's unfortunate phraseology, would be another example of Frisch's concern.[2] What is meant here is excessive unemployment that arises when labour is willing to work at prevailing or even lower wages but firms are not willing to hire, because they are uncertain that they will be able to sell the extra output produced. This is a chicken and egg problem. If more workers are hired they would increase total demand and firms as a group would benefit: therefore, they should be willing to hire more labour. However, each firm is

1. Some go back to Irving Fisher. However, Frisch accorded the distinction of inventing macroeconomics to Wicksell.
2. Haavelmo (1950) questioned the use of this terminology arguing that involuntary outcomes are not a within system property, since all outcomes there would be the result of voluntary actions. They emerge on comparison with the outcomes generated under alternative systems, for example, the neoclassical system as comparator.

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 14

uncertain that others will also react in the same way. To break the coordination bottleneck Keynes suggested measures that add to aggregate demand.

Of course, if each agent is omniscient and has faith that others are also omniscient and would not take advantage of a faith-based decision of his own, interaction need not generate macro phenomena such as unemployment. But the facts indicate otherwise. Typically, agents are myopic, information constrained, and beset with uncertainties. As the history of economic crises amply illustrates, sole reliance on the decentralized responses of individuals may not be sufficient to bring about desirable outcomes. When different individuals interact they unleash dynamic processes that are likely to be path dependant. Some of the equilibria that the dynamic processes generate are undesirable, and deliberate coordination may be needed to escape them. That destabilization has not been more pervasive points to the critical role underlying institutions and constraints have played in restraining and influencing potentially destabilizing human behaviour. What is the nature of these institutions and how do they emerge and evolve? I shall come back to this issue later.

It would be nice if we could pin down each individual's behaviour in a convenient formula, aggregate them so as to determine macro level excess demands and supplies, and then in a proper dynamic framework show how macro phenomena arise. This ideal has yet to be attained for reasons that I will now go over.

What sort of micro foundations: Behaviouralism or neoclassical rationalism?

Consider first the issue of how to characterise individual behaviour. A reasonable postulate is that individuals act as best as they can to satisfy the various wants listed in Table 1. They interact with others who are similarly motivated in an environment fraught with uncertainties. The economy is frequently exposed to shocks, and different individuals will perceive and respond to them differently. The psychological state of the individual, whether depressed or optimistic, calm or anxious, etc, will also be relevant. The precise nature of the decision taken is therefore a highly complex matter. Some of the key factors influencing the decision-making process are summarized in Table 2. Under the column head "the real world" is a listing, based on introspection and the findings of behavioural psychologists, of influential factors that are likely to apply.[3] The second column itemizes the corresponding treatment in rationalist, neoclassical, theories. The third column is culled from Keynes's General Theory.

The neoclassical micro-foundations approach is distinctive. It embeds in a macro framework the notion of the individual as a rational calculating utility maximizer with full knowledge of the relevant stochastic processes. The result is a macro theory that is entirely driven by the micro postulates, effectively reducing macroeconomics to a branch of microeconomics. For example, a macro economy comprising neoclassical utility maximizers with rational expectations and full information will not engage in any real adjustments in response to an anticipated

3. See, for example, Gilad and Kaish (1986).

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 15

increase in nominal aggregate demand.[4] The logic of the model is incontrovertible, but in the real world agents do not fulfil these assumptions. Even if the increase in aggregate demand is pre-announced, agent responses may vary if only because of different degrees of belief in the announcement.[5] The ensuing dynamic processes are more likely to be on the lines Hume wrote more than two centuries ago of an increase in treasure quickening the pace of economic activity. Both output and prices would tend to rise initially before output eventually reverts to its former level, and the price level has fully adjusted to absorb the expansionary impulse.

Several ingenious attempts have been made to reconcile the unrealistic macroeconomic implications of neoclassical microfoundations with the facts, usually through introducing a deus ex machina. Lucas (1972) argues that nominal demand shocks will cause output movements because agents confound a general price increase for a relative price change. Given the extensive media coverage of macroeconomic issues, this is difficult to justify. Fischer (1977) and Phelps-Taylor (1977) introduce frictions through ad hoc specifications of wage-setting behaviour. Agents adjust prices or wages at set regular intervals. This assumption conveniently facilitates analysis, but is it realistic? What is noteworthy about these attempts is their insistence on using the neoclassical micro foundations approach for positive analysis. But that objective may be questionable, and the several attempts to explain anomalies between neoclassical theory in a positive mode and reality are reminiscent of Ptolemaic patch-ups. The Copernician alternative would be to fundamentally reformulate the theory, which is precisely what Keynes had attempted with his behavioural psychology interpretation. Unfortunately, it has not yet been possible to properly formalize this more realistic conception, but there is promising ongoing work (see the review in Rabin, 1998).

Contrary to Keynes's emphasis on realism all the way, Friedman (1953) argued in an influential methodological contribution that realism in assumptions is unnecessary for the purpose of generating testable propositions and predictions. As long as these survived rigorous empirical testing, the theory was good and it did not matter that it was derived from idealized assumptions that were divorced from reality. However, Keynes would have rejected Friedman's positive methodology for not recognising the distinctive nature of macroeconomics as a social and moral science that prevents it from generating successful predictions on a par with the natural sciences.[6]

Keynes states (1938), "The object of statistical analysis is not so much to fill in missing variables with a view to prediction, as to test the relevance and validity of the model." This position accords with the dominant view in the philosophy of science that a central purpose of science is to provide satisfactory causal explanations that are supported by good predictions rather than focussing solely on the latter. Philosophers of

4. See Lucas (1972).
5. Johansen (1982) pointed out with respect to investment behaviour, "… if investors hold different anticipations about the future, then total investment may turn out to be very different from the case in which all investors hold the same anticipations, and the reactions to changes in policy instruments may be very different."
6. Hendry (2000) draws a useful sharp distinction between prediction, which he regards as inappropriate for a subject like economics but not for science, and forecasting, which can be undertaken in any number of ways and need not be tied to specific theories as with predictions.

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 16

Table 2.
Individual's decision making process: alternative formulations

The real world	*NC. Micro foundations*	*Keynes*
• Psychological state	Rational/emotion free, maximizing robot	Psychological propensities
• Social influences	Pure self interest	Herd behaviour/defunct economist
• Uncertainty	Von Neumann- Morgenstern (VN-M) expected utility	Non-probabilistic
• Limited information	Full information	Superstition
• Limited brains	Rational expectations	Rule of thumb
• Procrastination	Inter-temporal optimal option values	Eventually

science have had a field day criticising Friedman's methodology.[7]

Perhaps the most glaring drawback for Friedman's approach is that the predictions that were supposed to validate the method have been singularly unsuccessful. Macro-economics, whether of the Monetarist, Keynesian, Real Business Cycle or some other variety, does not predict well, and certainly not with the precision of the natural sciences, and sometimes can be terribly wrong.[8] This reflects a fundamental difference between the social and natural sciences, which Keynes adverted to in his insistence that economics is a moral science, and which Frisch later appeared to endorse in his decision models. Different criteria need to be applied when gauging success in economics than in, say, physics. Good economics like good physics requires satisfactory causal explanations, but whereas success in physics would be based on prediction validations, in economics it should be judged by the ability of its prescriptions to improve actual economic outcomes.

Rigorous micro foundations continued: The aggregation problem

A key issue in modelling the macro economy is how to aggregate the diverse behaviour of

7. See Hausman (2001).
8. However, some macro theories perform better than others, for example, Friedman's and Phelp's development of the expectations augmented Phillips curve. The aim should still be to get the one that describes, explains and predicts the best.

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 17

different individuals. Those who argue for a rigorous micro foundation usually adopt a representative agent approach. Kirman (1992) critically evaluates this procedure, and it is worth summarizing some of his main arguments regarding the conditions under which an agent can and cannot legitimately represent a collection of individuals. To begin with an aggregate of individuals cannot act like a single individual maximizer, nor does individual maximization engender collective rationality. But even overlooking this aspect, it is generally invalid to assume that the reaction of the representative individual to some change will be the same as that of the group that he or she represents. The representative's preference ordering between different choices is also unlikely to be reproduced by all of the individuals represented. This effectively rules out the use of the representative agent's preferences as a basis for deciding whether one situation is better than another. Since the scope for providing welfare comparisons is often presented as a major justification for the rigorous micro foundations approach, this criticism is quite devastating.

Kirman finds that the only way to salvage the representative agent model is to assume that all individuals are identical in every respect. But then, as he points out, there can be no competing wants and no basis for trade. This shuts out most of the macroeconomic problems listed in Table 1. A paradox is thus generated. Either the representative agent is not representative, or all agents are identical in which case there is no need for macroeconomics.

Given the problems with aggregation and the difficulty in formalizing a realistic view of the individual, it is natural to ask whether we could do without micro foundations. Why not simply focus on macro aspects? When the early astronomers wanted to explain the motions of the planetary system, they studied the planets themselves and not the atoms from which they are composed. Had the research strategy insisted on full micro-foundations at the outset, the gravitational forces influencing planetary motion would probably have been discovered much later, since their effects at the atomic level are miniscule.

But economics is quite different from astronomy. It does not deal with physical objects that are out there waiting to be discovered if only sufficiently powerful instruments were available. The objects of macro analysis are derived concepts such as national income, consumption and investment. They are categories that represent the activities of myriads of individuals, and are related to each other through identities generated by a consistent accounting framework. The macroeconomic identities result from the aggregation of similar identities that concern the behaviour of each of the myriad agents. Some understanding of micro behaviour therefore is vital and the aggregation problem has to be squarely faced.

However, the extremely restrictive representative agent construction is not required to derive "nice" properties such as downward sloping demand functions and stable equilibria at the macroeconomic level. Kirman reviews some fascinating research that shows that agent heterogeneity can under broad conditions be compatible with nice macro properties. His conclusions are appropriate (1992, p.134), "…the fact that behaviour at the macroeconomic level exhibits regularities does not mean that it is useful or appropriate to treat the economy as a maximizing representative individual."

Keynes, the Tinbergen approach, and the Lucas critique

Before addressing the issue of how best to undertake macro analysis, it is important to

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 18

clarify the issue of autonomy in structural relations. The desire for formalization and fascination of economists with the natural science model led to a seemingly innocent re-interpretation of Keynes so as to fit his theories into a more scientific mould. On the theoretical front Hicks (1937) contributed the IS/LM framework, which Keynes was apparently not at all enthusiastic about, but which became a macro theory staple for several decades. Unfortunately, IS/LM, and its subsequent reincarnation as the so-called neoclassical synthesis, trivialized Keynes's contribution. Mathematically, it reduced it to the introduction of an over-determinacy in the standard Walrasian framework that resulted from fixing nominal prices. This puts the burden of equilibration on quantitative adjustment, which was widely construed as the central contribution of Keynes's macro-economic theory. But this way of looking at it completely obscures the central roles played in Keynes's theory of uncertainty, of the behaviour of heterogeneous agents and their interactions, and the resulting coordination problems.

On the empirical front, Frisch and Tinbergen had developed an approach which was highly influential for several decades, but which Keynes regarded poorly from the outset, as did Frisch subsequently. The Frisch-Tinbergen approach, with IS/LM providing the key theoretical underpinning, consisted of specifying structural, or cause and effect, relations to explain human behaviour in the aggregate, for example a function to explain aggregate private consumption, another for private investment and so forth. These were estimated using econometric techniques that were developed in tandem, especially at the Cowles Commission, and to which Haavelmo made fundamental contributions. Models estimated on these lines were widely used for making predictions and for evaluating the effects of alternative policies.

Keynes especially objected to the Tinbergen approach as being psuedo-science. It is worth quoting in some detail Keynes's (1938) remarks in a letter to Roy Harrod, "I think we are a little bit at cross purposes…. My point against Tinbergen is a different one. In chemistry and physics and other natural sciences the object of experiment is to fill in the actual values of the various quantities and factors appearing in an equation or a formula; and the work when done is once and for all. In economics that is not the case…Tinbergen endeavours to work out the variable quantities in a particular case, or perhaps in the average of several particular cases, and he then suggests that the quantitative formula so obtained has general validity. Yet in fact, by filling in figures, which one can be sure will not apply next time, so far from increasing the value of his instrument, he has destroyed it…. *The psuedo-analogy with the physical sciences leads directly counter to the habit of mind which is most important for an economist proper to acquire.*" (Italics added)

Despite Keynes's critique, the Frisch-Tinbergen approach, which ironically came to be relabelled the Keynesian approach, was widely employed. It was not until its spectacular failure to account for the stag-flation in the mid-seventies, providing natural fodder for the Lucas (1976) critique, that the approach fell out of favour. The so-called Keynesian approach was faulted, not for being too scientific, but for not being scientific enough insofar as it conferred causal status on relationships that lacked autonomy. Lucas (1976) allowed that the empirically estimated macroeconomic relations of the Keynesian approach could have some predictive value, but only if the policy regime were kept unchanged. Change the policy regime and individuals will systematically adjust their

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 19

behaviour to better promote their interests in the new environment.[9] The macroeconomic relations of the Keynesian approach estimated for a given policy regime would cease to be valid, and now not just for prediction but also for policy formulation itself. They would give misleading indications as to how policies would play out. The issue here concerns the autonomy of structural relations, which Haavelmo from the outset insisted should be of as high a degree as possible so as to facilitate the analysis of policy changes, etc.[10] But Lucas went further when he insisted that the desired autonomy can only be obtained if the relations of the macroeconomic model are derived from rigorous neoclassical micro-foundations – the so-called deep theory approach, which attempts to encapsulate individual preferences in the form of parameters that are invariant to policy regime changes.[11]

At this juncture Keynes would surely have parted company with Lucas. In keeping with his behaviouralist views, he would have rejected Lucas's deep theory approach and argued instead for *deep psychology.* Before we can accept Lucas's deep theory as the starting point, we will need to ascertain whether human behaviour can, say, be pinned down in the form of a constant relative risk aversion (CRRA) expected utility function for a representative agent that is widely employed in current neoclassical micro foundations. In his letter to Roy Harrod Keynes insisted, "I mentioned before that it (i.e. economics) deals with motives, expectations, and psychological uncertainties. One has to be constantly on guard against treating the material *as constant and homogenous* (italics added)." Keynes's critique is thus deeper and broader than Lucas's critique. Whereas the latter only applies to macro structural relations, Keynes critique extends also to micro level representations such as the representative agent with a fixed utility preference function.

Psychology is critical for describing, explaining and hopefully predicting the behaviour of individuals pursuing their interests in an uncertain interactive environment. Many different psychological aspects are involved aside from those that directly concern preferences, some of which I list in the postulate below.[12] The tongue-in-cheek listing provided here attempts to capture the flavour of Keynes's behavioural argument and its macro implications:

Postulate: In the short-run, *uncertain, confused, misinformed, misguided, anxiety-ridden, greedy but occasionally inspired* individuals, interacting with each other like a bunch of manic depressives will generate uniquely macroeconomic phenomena. From time to time these could threaten acute destabilization that overwhelms the automatic equilibration mechanisms of the economy. Recovery may eventually take place, but the human cost could be substantial. Properly

9. However, in an exhaustive examination of empirical studies, Ericsson and Irons (1995) find very limited evidence of Lucas's critique in the data.
10. Moene and Rødseth (1991) note, "If Haavelmo's prescriptions had been followed, the now famous Lucas (1976) critique – that a Phillips curve estimated under one policy regime would break down if the government changed to another policy rule – might not have been necessary. The Lucas critique is a special case of Haavelmo's criticism of making policy simulations with relations that do not possess the required degree of autonomy"
11. For a comprehensive discussion of central differences between the approaches employed by Keynes and neoclassicists see Vercelli (1991).
12. In principle they are measurable, for example using a variety of self reporting scales developed by psychologists. However, research on how such factors interact with each other to influence decisions is still limited. For some suggestive research focussing on the manic depressive aspect see Andvig and Moene (1994).

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 20

conducted macroeconomic analysis and policy interventions based on it can help reduce the human cost.

What role then for neoclassical, rationalist micro foundations?

If our Keynes based behavioural argument is correct, there is no role for the traditional neoclassical micro foundations in a positive analysis. At best they might indicate what the individual, on sober reflection, would regard as the ideal way to make decisions. A general equilibrium theory based on these premises can be useful in indicating the nature of the optimum that would prevail in the absence of frictions and other distortions. It provides a counterfactual to the actual state, and can suggest reasons such as the mode of economic organization, various frictions and distortions, and information asymmetries as to why the counterfactual state's superior properties are not being achieved. Furthermore, the extended analysis within a well understood, standardized, framework of the implications of alternative institutional arrangements and policy changes can be very useful.[13] For example, alternative tax reform packages will bear different implications for the economy and social welfare. Examining these in an idealized model setting with clean lines can help decision making concerning which of the reform packages to choose, but with the strong caveat that the implications derived may not apply in a real world context.

The lack of realism caveat would also temper the normative use of the model. It is often argued that even though the superior neoclassical organizational mode may not be feasible, since it is based on assumptions that can never be fully attained, it provides a beacon that lights up the direction in which reforms should move. There is merit to the argument, but once again it has to be treated with circumspection. It is too facile to conclude that because frictions prevent the attainment of the theoretically highest optimum, they should all be removed. It would instead be more appropriate to examine functions that the frictions fulfil, some of which could be valuable.[14]

The following example concerns frictions that used to exist in many countries between financial intermediation and the housing market in the form of heavily regulated lending. Their effect was to make housing, which for most people is a long-term investment, relatively illiquid. From a neoclassical perspective this is inefficient. There is value in the properties, which if tapped both releases resources to add to consumption or investment and better tailors the investment and it's financing to the risk preferences of households. The logic appears irresistible, and financial intermediaries who stand to gain become strong advocates in favour of elimination. The barriers get removed, liquidity is improved, speculators are attracted, property values escalate, and households engage in more leveraged borrowing as has happened in many countries that deregulated.

Suppose next an event causes interest rates to rise. The neoclassical representative agent will have done the appropriate inter-temporal calculations and rationally anticipated such a possibility. However, myopic, information constrained, insecure households, fearing a

13. It can also be good pedagogy.
14. As Haavelmo (1950, p.8) put it "In the final analysis it is, therefore, not a question of whether or not these are constraints upon the market point but rather a question of how these constraints have come about."

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 21

future rise in interest rates may have borrowed even more than they really could afford. In this way some of the conditions for a financial crash are created. It may be that the traditional firewalls evolved to prevent that sort of outcome. The firewalls may be inefficient from a resource allocation perspective and could be improved upon, but this should not be done at the expense of the stabilizing influence they exerted. However, what needs to be emphasised is that the need for the latter will not appear evident when you start off with the neoclassical representation of the individual. Basu (2003, p.896) put it succinctly, "If no one is irrational, there can be no need to protect the irrational".

Relying on neoclassical priors leads to a mind-set in which frictions are regarded as akin to "bad cholesterol" that prevents the attainment of a superior welfare optimum. If instead we had a behavioural view of agents operating in a more realistic setting, we might find that some of the frictions are in fact playing the "good cholesterol" role and that in their absence the outcome could be worse. Many other examples can be given of how the indiscriminate elimination of frictions has resulted in destabilization and systemic failure, for instance in the former centrally planned economies, the savings and loans crises in America, and so forth. The point is not that inefficient frictions should be preserved, but that before they are removed the reasons for their presence should be established and effective strategies put in place for containing any risks attendant to their removal.

The Right Macroeconomic analysis for stabilization?

It is now time to bring together the threads of the methodological review to answer the question of how macroeconomic analysis should be undertaken so as to help the policymaker, especially when confronting macroeconomic stabilization issues. The discussion so far reveals that so-called Keynesian type structural formulations are inappropriate because they lack autonomy. Nor is the neoclassical micro foundations approach for supplying needed autonomy useful, since it lacks realism.

It is indicative of the limited progress made that the methodological issues raised here were addressed much earlier by Frisch. Andvig (1985) indicates how Frisch's thinking underwent profound changes in his concern to promote superior social outcomes.[15] A starting point would be the Frisch-Tinbergen approach, and his soon to occur doubts about the lack of autonomy of the estimated relations. Frisch proceeded to experiment with theoretical constructions that would reproduce empirical observations, and developed an inspiring formulation of dynamic processes reminiscent of Wicksell's rocking horse. The approach distinguishes between external shocks that affect the particular equilibrium of the dynamical system and its internal dynamics, as given by its homogenous solution. In this context he pioneered in developing the technique of calibration, which has now become an active tool of research in real business cycle theorizing. But this too he regarded as limiting. A given set of empirical observations could be consistent with many alternative theories, which would all be more or less

15. See also Andvig (1988).

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 22

observationally equivalent. One could select a theory that tells an appealing story and through appropriate calibration ensure its consistency with the observed facts. But one could do the same with other theories, and how should one select amongst them? The major drawback with the calibrated fitting of data to a story is that it is a technique that does not control for any other plausible factors that are not mentioned in the story but that may have influenced the data. Calibration does not appear to provide a sound basis on which to formulate policy in real time.[16]

Frisch abandoned calibration and focussed thereafter entirely on the purposive nature of macroeconomics in his so-called decision models. If the intention is to satisfy the sort of wants noted in Table 1 and promote overall welfare, priorities must be established. He believed a social welfare function could be derived from interviewing policymakers. This should be maximized subject to a set of autonomous restrictions that would comprise definitions, accounting identities, and technical constraints such as input-output relations that indicate the feasible production set for the economy. Following this selection phase of identifying objectives would be an implementation phase. Here the economist would try to figure out how best the objectives can be met, using a pragmatic approach. Interaction with policy makers would indicate which potential instruments were available and what aspects of behaviour should be retained or modified.

What is noteworthy about the decision model is its limited reliance on behavioural relations at the outset. These would become important at the implementation stage but since they did not have the appropriate degree of autonomy, would have to be dealt with flexibly. The availability of adequate instruments was instead stressed, with success measured by the ability to meet the welfare criteria that were set.[17]

The proposed use of Frisch's decision model is thus analogous in spirit to what Keynes appears to have had in mind. Once again, Keynes put it distinctively when he stated in the General Theory (1936, p. 297), "The object of our analysis is not to provide a machine or method of blind manipulation, which will furnish an infallible answer, but to provide ourselves with an organised and orderly method of thinking out particular problems…" He elaborates further in his letter to Harrod, "*Economics is the science of thinking in terms of models joined to the art of choosing models which are relevant to the contemporary world*…The object of a model is to segregate the semi-permanent or relatively constant factors from those which are transitory or fluctuating so as to develop a logical way of thinking about the latter, and of understanding the time sequences to which they give rise to in particular cases (italics added)." Thus if the problem is to reduce high unemployment now, and prior analysis has shown that demand side influences are more active in the short-run, Keynes's advice would be to set aside longer reacting supply side factors and concentrate instead on quick acting fluctuations in aggregate demand.

Following Keynes's reasoning models should be kept relatively simple, without very long causal chains, since the basic behavioural relations of the model are already likely to exhibit a high degree of variability, and there

16. For a perceptive modern critique of the limitations of calibration see Hansen and Heckman (1996). Hoover (2001) and Sims (1996) also provide critical evaluations.
17. Instruments were abundant in the immediate post-war period in Norway owing to the highly regulated nature of the economy, but have since declined.

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 23

would seem little point in compounding the variability. For instance, empirical analysis shows that the principal influences on consumption are income, wealth and the real interest rate, but their relative effects, which depend on many other factors, varies. Attempting to extend the causal net to include the latter may not lead to much gain in explanatory power. If the best that can be hoped for are broad indications of likely consequences, then it is preferable to generate these in a transparent, compact model rather than through a black box formulation.

A useful model would be based on an insightful list of causal influences derived from several different sources: rigorous backward looking econometric work, real business cycle calibrationist models, introspection, behavioural psychology, informal observation of macroeconomic aggregates, and anything else that promotes understanding. This in essence is Keynes's approach in the General Theory. Relying on informal behavioural micro foundations, he developed a style of macroeconomic analysis that is looser, more fluid, and avowedly less similar to the style widely employed in the natural sciences, or now enjoined by new classical micro foundations. The advantage is that it confers flexibility, which is very useful when dealing with rapidly changing phenomena as in a stabilization context. The drawback is the scope for controversy regarding the interpretation of the models and their implications, which has been endless for Keynes's General Theory. Formalization is desirable, but much more research is needed before this can be done satisfactorily. [18]

A simple model built around some fundamental identities and with a limited number of broad, transparent, relations provides a framework that facilitates the informed discussion of policies to promote desired outcomes. This in essence is what Frisch proposed in his decision models. The fundamental national income accounting identities provide the model's skeleton. It can be articulated to the extent needed to identify the different type of goods or assets of interest to the analyst. However, a problem is posed in integrating the income and product accounts with the financial accounts and balance sheets, which may not have been so important for Frisch given the highly regulated financial sector then prevailing. This has to do with the stock-flow problem of critical importance to the determination of the model's dynamic equilibrium. It is manifest in the IS/LM formulation, where IS refers to flows per unit of time while LM concerns balance sheet transactions that hold at a point in time. Their unsatisfactory integration in his model gave Hicks a great deal of concern later in his career. He argued that the resolution of this problem is critical to the development of a satisfactory dynamics of use in policy making. Here, once again, real business cycle models and other neoclassical variants that are based on explicit intertermporal optimization avoid the problem. Agents, in maximizing their intertermporal utility functionals, choose an optimum

18. Keynes, while an accomplished mathematician, dismissed mathematical formalization in policy-oriented economics on the grounds that "…we can keep (verbally) "at the back of our heads" the necessary reserves and qualifications and the adjustments we shall have to make later on, in a way in which we cannot keep complicated partial differentials "at the back" of several pages of algebra." (1936, p. 297). Frisch (1970) shared some of Keynes concerns, coining the term "playometrics" to refer to the frivolous use of mathematics to derive extended implications of unrealistic axiomatic systems in economics and provided some telling examples. However, he remained a very strong proponent of the use of mathematics when done properly.

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 24

consumption path (flow) to bring about whatever stock accumulation profile that would maximize their intertermporal welfare. But the automatic reconciliation of stocks and flows thereby achieved throws out the baby with the bath water. Balance sheet shocks, such as extreme housing asset valuations and their adverse implications for savings flows, etc are all thrown out.

Keynes's models, the initial IS/LM representation and its open economy Mundell-Fleming extensions (see especially Mundell, 1968), provide examples of convenient platforms in the above sense. Such models are eminently practical. They are based on simple but powerful insights, which have a degree of validity under fairly general conditions. The behavioural relations of the models are basic and are intended to represent a fair degree of autonomy, but these are not immutable. Thus consumption and tax revenue generally respond to income to a greater extent than do investment or government expenditure. A plausible theory for determining nominal GDP would make the first two endogenous and the latter two exogenous. But the assignment could change if the budget is always balanced and government expenditure follows revenue, etc. It is no surprise, therefore, that the flexibility and realism of such models makes them the preferred choice in practical policy making. What they may lack in precision they can make up through regular monitoring, modifications and course corrections as required for promoting the purposive goals.[19]

A specific example would be the IMF's monetary model, which is a pioneering example of inherent stock-flow dynamics. It employs the simple insight that a country that has a balance of payments problem is living beyond its means. Reducing the balance of payments deficit will require bringing its expenditures in line with its income, which means restricting access to financing. Doing so through the imposition of bank credit ceilings will bring about adjustment in the needed direction. While the monetary model could be solved mechanically to generate seemingly precise settings for the control instrument, in practice the controls are introduced flexibly.[20] They are based on detailed negotiations with the country representatives that take into account various needs and contingencies. As a further safeguard, they are subject to frequent monitoring and the job of improving the balance of payments gets done. The improvement may not be sustainable, but that is a different issue.

Practitioners have to use some such framework. But this particular framework is too limited. The world has changed, as have some of its priorities, giving rise to new trade-offs and concerns, but the model has not been renewed. How should it be adapted to the new world of floating exchange rates, the deregulation of financial markets, or to new concerns such as restraining the rise in poverty? Lacking the needed elaboration, the handling of these additional topics is necessarily ad hoc, with the result that they may not even be consistent with the traditional balance of payments orientation of IMF credit ceilings in country programs.[21]

19. The neoclassical purist will argue that this smacks of fine tuning and is bound to fail. This can only be regarded as an extreme view since hardly any government will stand by and allow an unstable situation to get out of hand.
20. Although the Polak model provides the underpinnings, the IMF staff use an even simpler formulation built around a system of interlocking accounts, and in which nominal income is assumed to be exogenously given (see IMF, 1987).

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 25

Research is needed, but surely not in the direction of providing spuriously rigorous micro-foundations, since this is unlikely to improve on the basic insight of the causes of the balance of payments problem. Unfortunately, the needed research does not get done, because interest has been diverted to a seemingly much more scientific formulation of models, and practical policy-making suffers, with adverse effects on the community.[22] Keynes goes on to remark in his letter to Harrod, "Good economists are scarce because the gift for using 'vigilant observation' to choose good models, although it does not require a highly specialised technique, appears to be a very rare one." Frisch, who had greater faith in econometrics than did Keynes, echoes the remark when he states that econometrics is a powerful and dangerous tool "…it should only be put in the hands of really first-rate men…" (Cited in Bjerkholt (1998)).[23] The dearth of first rate men, or women for that matter, and the enormous demand for economic advice puts pressure on developing mechanical aids that will generate the "right" solution. Unfortunately, the nature of the subject and the current state of the arts does not permit a convenient "method of blind manipulation" as Keynes put it.

Which Way Now?

Predicting future trends of any subject and even more so for a social science is risky. Nonetheless, it does seem clear that with the self-selection of so-called "rocket scientists", their considerable self-investments in the demanding new psuedo-scientific techniques, and their spread through the ranks of academia, the disconnect between theoretical research and practical work will possibly become even more pronounced. Frisch's (1949) remark is apposite, "…we are facing a race between economic research and economic facts. It is no exaggeration to say that it is a race of life and death." But the situation has a dynamic. Acute macroeconomic problems will likely mount, more crises will result and the IMF's casualty case list will expand.

Disillusionment with the current fashionable tools and conceptual frameworks may then set in that could lead to a salutary change in the research agenda, especially with regard to stabilization policies. This could result in greater recognition of the unique nature of macroeconomic phenomena, and increased work on improving and extending the scope of basic frameworks such as the IS/LM and IMF monetary models. The often heard remark that a piece of macroeconomic analysis cannot be taken seriously since it lacks adequate micro foundations would be toned down. Work on unrealistic micro foundations, especially of the representative agent type with standard neoclassical utility functions, would be redirected to more realistic representations, with more time spent on analysing the roles played by various frictions. Above all there would be greater collaboration with psychologists to develop behaviour compatible stabilizing institutions so as to lessen the burden on that rare creature – Keynes's hard to find economist.

21. I have attempted to show in Chand (2003) how the poverty ratio, which can be highly volatile in the short-run, can be incorporated as an objective of stabilization policy in the IMF model.
22. The distinguished array of chief economists that the IMF has employed in recent years have all been on the cutting edge of modern macroeconomic research, which perhaps explains their lack of interest in renovating the Mundell-Fleming IS/LM open economy model let alone the Polak model.
23. I will refrain from repeating a remark attributed to Stiglitz about the quality of IMF economists.

02 NOPEC 30 (1) Chand 10-09-04 12:50 Side 26

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