Algorithmic Social Sciences Research Unit

ASSRU
Department of Economics
University of Trento
Via Inama 5
381 22 Trento, Italy

Discussion Paper Series

6 – 2012/II

TOWARDS A POLITICAL ECONOMY[♣] OF THE THEORY OF ECONOMIC POLICY[♥]

K. Vela Velupillai

October 2012

[♣] I am using this 'loaded' phrase in what I consider to be the enlightened sense in which it is used by Harcourt (1992) and Groenewegen (1987, [2008]), has tried to explain it (and *not* in the sense in which it is characterized in Alesina, 2012, where, moreover, there is a subtle variation of the term: *political economics*, rather than *political economy*).

[♥] This is the written text of an earlier oral presentation at the *Cambridge Journal of Economics Conference in Honour of Geoff Harcourt's 80th birthday*: **The Future of Capitalism**, held on June 25/26, at Robinson College, Cambridge. I am deeply indebted to Stephanie Blankenburg for inviting me to a superbly organized conference and for welcoming me with impeccable courtesy and generosity. I am also in debt to her, and to the Chairperson of my session, my 'old' friend, Tony Lawson, for invaluable critical comments, and to several in the audience who posed critical and interesting questions, some of which were important in sharpening loose claims in the original version. None of them are responsible for any of the remaining infelicities.

ABSTRACT

The theory of economic policy, *in its mathematical modes*, may be said to have had two incarnations, identified in terms of *pre-Lucasian* and *ultra-Lucasian* on a time-scale, whose origin can be traced to the Scandinavian works of the 1920s and early 1930s, beginning with Lindahl (1924, 1929), Frisch (1933) and Myrdal (1933). The end - mercifully (meant *perversely*) - of the ultra-Lucasian period, in Frances Fukuyama senses, might well have been the date of Prescott's *Nobel Prize Lecture* (Prescott, 2004). The codification of what may be called the `classical' theory of economic policy was initiated in the pioneering formalisations by Frisch (1949, a, b), and Tinbergen (1952), elegantly summarised in Bent Hansen's early, advanced, text book (Hansen, 1955). The launching pads for the ultra-Lucasian period were the *Lucas Critique* (Lucas, 1975), the elementary *saddle-point dynamics* based *policy ineffectiveness* `theorem' in a *Rational Expectations* context by Sargent and Wallace (1976) and the *Dynamic Programming* based *Time-Invariance* proposition in Kydland and Prescott (1977)♦. In this essay I try, first of all, to trace a path of the mathematisation of the theory of economic policy, from this specific origin to the stated culminating point. Secondly, an attempt is made to expose the nature of the Emperor's New (Mathematical) Clothes in which the mathematisation of the theory of economic policy was attired. Finally, it is shown that the obfuscation by the mathematics of efficiency, equilibrium and the fundamental theorems of welfare economics can be dispelled by an enlightened, alternative, mathematisation that makes it possible to resurrect the poetic tradition in economics and ‘connect the prose in us with the passion’♠ for policy *in the manner in which Geoff Harcourt has `connected' them.*

♦ There is, of course, the important contribution by Ramsey (1928) as another kind of ‘origin’.

♠ I have in mind the opening lines of Chapter XXII of E. M. Forster's **Howard's End** (italics added):

> "Mature as he was, she might yet be able to help him to the building of the rainbow bridge that should *connect the prose in us with the passion*. Without it we are meaningless fragments, half monks, half beasts, unconnected arches that have never joined into a man."

§1. A PERSONAL PREAMBLE - OPENING AN INNINGS

" Bring back Hassett!"[1]

I am on record, in an earlier modest attempt at paying homage to Geoff Harcourt, of regretting the missed opportunity of opening an innings with Geoff for Clare Hall. I forgot that my regrets are doubled by also missing the chance to open batting with him for King's College, of which we were both graduate students, albeit separated by more than a decade and a half. No conversation with Geoff, in all the almost forty years I have known him, as a mentor, friend, even - for a few brief years - a colleague (of sorts), was ever considered complete without some mention of events in the noble game - past and present. Lindsay Hassett and Arthur Morris, together with Ray Lindwall and Keith Miller were our shared heroes, but his wisdom and vintage went back to greater mortals than mine: Bradman, of course, but also the West Indian giants of the early 1950s, 'those two little friends of mine, Ramadhin & Valentine' and, then, the legendary three Ws.

We reminisced about Cricket's giants, as we did, in the same breath, the majestic contributions to economics of our common Cambridge teachers, mentors and friends: Sraffa, Goodwin and Joan Robinson, above all, but also Kahn and Kaldor, Godley and Dobb and those beyond - Hicks and Myrdal, Kalecki and Hudson, Tsuru and Morishima. Geoff Harcourt is my last living link with the golden age of economic theory - and the equally vintage era of willow on leather.

Some Cambridge Controversies in the Theory of Capital (Harcourt, 1972) was published by CUP in 1972. My (paperback) copy of that classic was bought at a now defunct left-wing, nonprofit, bookshop in Lund, on 28th October, 1972, for the princely sum of SEK. 26.35, just about what I could afford with my part-time earnings as a cement factory labourer, trying to do a doctorate at the University of Lund. I had begun studying economics, as an

[1] Geoff Harcourt's spontaneous reaction to my laments about the state of test cricket `these days'! Lindsay Hassett was the diminutive Australian test cricket captain who famously `lost the ashes' to England in the `Coronation' year, 1953, Hassett was a brilliant batsman, in the later stages of the `Bradman era', Bradman's successor as captain of Australia and every bit as shrewd as his illustrious predecessor in the tactics of the noble game. But he was a gentleman, with a capital `G' and was magnanimous in victory and nobly humble in defeat, who never resorted to any unethical methods to win a game. In these respects Hassett reflects Geoff's own Gentlemanly personality in admirably similar ways.

undergraduate, in 1971 and was allowed to proceed to doctoral studies from the academic year 1972. One of the compulsory doctoral courses, in those enlightened years, was on *Capital and Growth Theory*, with Geoff's above classic and his **Penguin Readings**, edited with Neil Laing (Harcourt-Lang, 1971), as lead texts.

They were, together with Björn Thalberg's Cambridge and Oslo based lectures on macroeconomics, the decisive influences on my visions of economics, as it would be for a *relevant theory of economic policy*. Moreover, it was due to a personal act of kindness and decisive intervention on my behalf, by Geoff Harcourt, that persuaded Kaldor to admit me as a doctoral research student, initially to be supervised by him, at Cambridge. Nothing before, or after, changed my intellectual outlook and life as much as that one act of generosity by Geoff did, and achieved.

The rest of the paper is organized as follows. In §2, a kind of story of the way the notion of rules was sanctified in the theory of economic policy is outlined. The backup for this sanctification is the mathematization of the theory of economic policy, which is discussed in §3. Finally, the main conclusion that a demonstration of the essential incompleteness of economic theory entails a return to the tradition of political economy in the theory of economic policy is outlined in §4.

§2. THE 'SANCTIFICATION' OF *RULES* IN THE *THEORY* ECONOMIC POLICY

> "The neoclassical tradition, like the Christian, believes that *profound truths can be told by way of parable*. … *Even as parables, they must be expunged from the Bible proper* …, though no doubt they will continue to be told in the commentaries and Sunday School lessons for a long time to come."
> Harcourt (1972, pp. 122, 124; italics added)

Wicksell (1936, [1898]), more than a century ago, in what I consider to be the fountainhead of modern macroeconomic theory and policy, **Interest and Prices**, readily acknowledged that the 'subject did not appear to [him] to be ripe for *methods of precision*'(ibid, p.xxx; italics added). A little over a century later, in his Nobel Memorial Prize Lecture, titled *The Transformation of Macroeconomic Policy and Research*, Prescott (2004; italics added) was less sanguine, outlining what I have come to refer to as the *Three Newclassical Dogmas on the theory of economic policy*:

i. "[T}he meaning of the word *macroeconomics* has changed to refer to the tools being used rather than just to the study of business cycle fluctuations[2] (p.371).

ii. Before the transformation what is evaluated is a policy *action given the current situation*. .. After the transformation, what is evaluated is a policy *rule*... Before the transformation, optimal policy selection was a matter of solving what the physical scientists called a control problem. .. After the transformation …the time inconsistency of optimal plans necessitates following rules (pp.372-4).

iii. Some of [the needed] tools .. crucial to the study of business cycles are Lindahl's extension of general equilibrium theory to dynamic environments; Savage's statistical decision theory as *uncertainty* is central to business cycles; Arrow and Debreu's extension of general equilibrium theory to environments with uncertainty; Blackwell's development of *recursive methods which are needed in computation* and in representation of a dynamic stochastic equilibrium; Lucas and Prescott's development of *recursive competitive equilibrium theory*, and, of course, the *computer* (p.392).

His fellow newclassical[3] advocate of 'rules rather than discretion' is equally categorical that 'we are directed by, if not prisoners of, the mathematical tools we possess' (Sargent, 1987, p.xix), especially in the context of economic policy:

> "*In terms of economic policy*, thinking of stochastic processes promotes regarding *policies as stochastic processes* for the variables under the control of the policy maker. .. [O]ne is prompted to think of policy-making as a process producing a strategy which is to be used repeatedly over time and which results in a stochastic process for the policy maker's instrument of control. This is a good example of an area in which *the tools that we are using influence the very questions that we ask and the way that we pose them*. Thinking about *policy* in terms of repeated strategies or *rules* or *regimes* is natural for someone who *thinks about dynamic economics in terms of stochastic processes*."
> Sargent, loc.cit., p. xxi; italics added.

What of economists who did *not* think of dynamic economics in terms of any kind of mathematical process? For example, the founding fathers of the macroeconomic theory of economic policy, Wicksell, Lindahl and Myrdal[4] did not think of dynamic economics in

[2] *Macroeconomics*, from the outset, was much more than 'just .. the study of business cycle fluctuations'. Monetary theory and banking policy were the defining origins of the subject, especially in Wicksell (1898), to which, much later, the theory of employment and business cycle theory were grafted, as it became clearer, particularly in the works of Lindahl, Myrdal and Keynes, that its defining scope was the interaction of real and monetary variables, in studying the pathology of aggregate dynamics. I am sure Geoff Harcourt would want me to include Kalecki to this triumvirate – and all and sundry may castigate me for leaving out Hayek, Robertson and Frisch; but this is not a doctrine historical exegesis on the origins of macroeconomics (see, however, Velupillai, 2008).

[3] At the time the original draft of this text was prepared Tom Sargent had not yet become Prescott's fellow economics nobel laureate!

[4] In personal conversations with me, Mrs Gertrud Lindahl told me, in 1982, the following story. Ernst Wigforss, the Finance Minister of the newly elected Social Democratic government of Sweden, in 1933, a good personal friend of her husband, Eric Lindahl, and of

terms of any kind of mathematical dynamic process – stochastic or deterministic. Yet they were able to devise, and help implement, sensible, effective, measures, based on national accounts defined, collected, tabulated and constructed precisely for the purposes of monetary and fiscal policies. Indeed Lindahl, in a perceptive critique of two of the 'patrons' of newclassical, Chicago, visions of policy, Friedman and Simons, was able to point out:

> "The papers collected in the section on monetary policy ... leave the reader in a state of embarrassment. ... [T]here seems to be an urgent need for a more rational policy. But the papers by Henry C. Simons and Milton Friedman, although intellectually interesting as attempts *to solve the insoluble problem* of almost entirely substituting *rules for authorities*, do not give much guidance for the realization of this aim. Even if one highly sympathizes with the idea that the monetary authorities should be bound by certain rules -- in the first place to maintain a stable price level -- one feels *the problem must be taken up in a more practical way*."
> Lindahl, 1952, p. 507; italics added.

And, then, what of those who choose to view and model dynamic economics in terms of other kinds of mathematics, say nonlinear, nonstochastic, dynamics? Is there anything that can be modeled or formalized by stochastic processes that cannot be done by nonlinear, nonstochastic, dynamic processes? In fact, respecting the data types of economics – which are defined on the rational numbers or, at best, the algebraic numbers – I conjecture that only nonlinear, nonstochastic, dynamic processes can encapsulate them in a formalization that maintains fidelity to the conceptual basis of economic categories[5].

An advanced text book on **Diffusions, Markov Processes and Martingales** (Rogers & Williams, 2000, p.1), defines, on the first page, *Brownian motion*:

Gunnar Myrdal, had come to them with a 'plea': 'Please give me a theory of policy that can justify the underbalancing of the budget, so that I can counter the 'attacks' by the leader of the opposition, Gösta Bagge, who is also the Professor of Economics at Stockholm. He will harness the full power of the balanced-budget doctrine to undermine my policy proposals.' Thus Myrdal (1933), built on the foundations provided by Lindahl (1924, 1929) came into being, and was, subsequently, the basis for the Frisch-Tinbergen-Hansen-Theil formalization, in terms of the target-instrument dichotomy of the theory of economic policy (see Frisch, 1949a, 1949b; Tinbergen, 1952; Theil, 1965 and, in particular, Hansen, 1955) – a tradition summarized with spectacular irrelevance in Preston & Pagan (1982), just as the defining core of the newclassical paradigm came of age with Kydland & Prescott (1982).

[55] Despite the ill-argued view put forward by Lucas and Sargent (1979 [1981]), p. 314:
"It is an open question whether for explaining the central features of the business cycle there will be a big reward to fitting nonlinear models."

A real-valued stochastic process $\{B_t: t \in \mathbb{R}^+\}$ is a Brownian motion if it has the properties

1.$B_0(\omega) = 0, \forall\omega$;

2.the map $t \mapsto B_t(\omega)$ is a continuous function of $t \in \mathbb{R}^+$ for all ω;

3.for every t, $h \geq 0$, $B_{t+h} - B_t$ is independent of $\{B_u : 0 \leq u \leq t\}$, and has a Gaussian distribution with mean 0 and variance h.

The authors, then, go on to ask, and give four answers to the question, 'Why study it?' (ibid, p.1):

"(i) Virtually *every interesting class of processes contains Brownian motion* - Brownian motion is a martingale, a Gaussian process, a Markov process, a diffusion, a Lévy process, ...;

(ii) Brownian motion is sufficiently concrete that *one can do explicit calculations*, which are impossible for more general objects;

(iii) Brownian motion can be used as a building block for other processes Indeed, a number of the most important results on Brownian motion state that *the most general process in a certain class can be obtained from Brownian motion by some sequence of transformations*;

(iv) Last, but not least, Brownian motion is *a rich and beautiful mathematical object* in its own right."

Suppose I now defined a Turing Machine and made the same four claims and ask an economist to choose between the two formulations?[6] Which of the two formulations should the economist choose, for modelling dynamic economic processes? What kind of considerations should the economist take into account before deciding for one or the other of the two formulations to model dynamic economic phenomena? I would urge the economist, in his or her deliberation phase to remember the nature of the domain and range over which economic variables can, at best, be defined. I would also urge the economist to keep in mind

[6] To be quite rigorous and complete, I should add the usual formal definition of a *formal dynamical system* (cf., Hirsch & Smale, 1974, pp.159-160) and consider the `coupled' system of the Turing Machine and the formal dynamical system. Such a coupled system can satisfy the four claims as easily, if not also capable of displaying itself as a more `beautiful mathematical object in its own right'.

that the Brownian motion, is a *Weierstrassian monster* - i.e., continuous-everywhere, differentiable nowhere, nonstochastic dynamic process, in its origins.

The added advantage of the nonlinear, nonstochastic, modeling of the processes of economic dynamics, added that is to maintaining fidelity to the data types of national income accounting, is that – when coupled to a the computational processes of a Turing Machine – this approach enables one to give precise content to Lindahl's intuition on trying *to solve the insoluble problem* of almost entirely substituting *rules for authorities*'.

As Geoff Harcourt noted, in a slightly different context (Harcourt, 2006, p.146; italics added):

> "My contention is that, according to which view is 'correct', makes a drastic difference to our understanding of the world, and *how specific policies may be perceived, recommended and evaluated*."

§3. THE VARIETY OF MATHEMATIZATIONS OF THE THEORY OF ECONOMIC POLICY

> "By insisting that truth comes only in the guise of a mathematical model, we may so desiccate the factors that we are trying to include in our models that they become very poor vehicles for interpreting the processes at work in our economies."
> Harcourt, 1992, p. 197.

To characterise 'the variety of mathematization of the theory of economic policy', say from Myrdal (1933)[7] to Prescott (2004), it is at least necessary to outline the conceptual development of the *economic theory of policy*, in the relevant period. I believe the following summary classification is not a complete distortion of the historical 'lineage':

1. Targets-Instruments/Static-Dynamic[8]
2. Proportional/Derivative/Integral Stabilization Policies – Phillips (1950, 1954, 1957)
3. Optimal Policies – Frank Ramsey (1927, 1928) to Cass-Koopmans (see Romer, 2006)
4. Policy Ineffectiveness/Credibility/Time Inconsistency – Lucas (1981), Sargent-Wallace (1976) & Kydland-Prescott (1977, 1982)

[7] It should really be from Ramsey (1927, 1928), but in the interests of space and other unmanageable issues I will have to leave considerations of the way Ramsey's intellectual, conceptual and mathematical seeds came to be transplanted in an alien philosophical and epistemological soil – and harvested for purposes I cannot imagine that great Cambridge logician and philosopher would have approved.

[8] See above, footnote 4 and as mentioned there, codified in a spectacularly untimely text by A.J. Preston & A. R. Pagan (op.cit).

5. Inefficiency of Policy in an Intertemporal (Overlapping) Equilibrium Model – Nonlinear Dynamics (Grandmont, 1982)
6. Efficiency of Policy Underpinned by the *Fundamental Theorems of Welfare Economics* – New Keynesian & New Classical (Lucas & Stokey, 1989 and Woodford, 2002)

Against the backdrop of the above sequence of the way the economic theory of policy came to evolve, despite the many regrettable omissions, it is possible to characterize the varieties of mathematical formalisms that have been harnessed to encapsulate them. But before I list them I must add the caveat that it was not always the case that the economic concepts were devised and defined before a mathematical formalism for them were found; it was more often the other way about[9].

Thus the classical theory of economic policy, known as the 'target-instrument' approach, was formalized in terms of ordinary and stochastic differential and difference equations and the related Phillips approach, underpinned also by the famous analogue computing machine, the *MONIAC* (Velupillai, 2011), belongs to the same mathematical tradition. On the other hand, 'Ramsey economics' (Samuelson, 1969), began with the calculus of variations and is now part of the folklore of textbook teaching via optimal control theory. The last three, part of the dominant orthodoxy for the past quarter of a century, have come to be referred to as *Recursive Macroeconomics* (Ljungqvist & Sargent, 2004). Their mathematical underpinnings are in *dynamic programming*, *Markov decision processes* and (*Kalman*) *filtering theory*, made to work for policy-related questions in a framework where the fundamental theorems of welfare economics (FTWE) are the defining bases, in so-called Dynamic Stochastic General Equilibrium Models (DSGE) whose core is, in turn, the Recursive Competitive Equilibrium (RCE) of real business cycle theory (RBC). The FTWE are, in turn, derived from, and underpinned by, the mathematical triptych of *separating hyperplane theorems* (in particular, the Hahn-Banach theorem), *fixed-Point theorems* and the *Uzawa Equivalence theorem* ('proving' the equivalence between the *Brouwer fix-point theorem* and the Arrow-Debreu version of the *Walrasian Equilibrium Existence theorem*).

However, from any formal notion of computation, based on a model of computation, it is easy to show that every one of the above formalizations is seriously incomplete in formal senses. Recursive undecidabilities, formal incompleteness and both constructive and

[9] As feared by Harcourt in his perceptive observation with is the lead quote in this section.

computable ambiguities permeate every one of the above mathematical formalisms. These claims are formally demonstrated in a series of papers I have authored (or co-authored) over the past decade a half (cf., Velupillai, 2010), often in the context of the theory of economic policy (see, in particular, chapters 6. 7 & 16 in Velupillai, loc.cit).

These results make nonsense of the claims in Lucas (1981, chapters 13 & 15), Prescott (2004) and Sargent (1987), all of whom underpin their case for rules on the virtues of formal computational possibilities, but derive their propositions against 'discretion' on the basis of mathematical models that are computationally meaningless[10].

There are some concepts that are impossible to formalize; there are implications, from even those that can be formalized that are not only ambiguous but also provably unknowable. That there are pervasive uncomputabilities and undecidabilities in every kind of formal mathematics is, by now, almost 'common' knowledge, although that does not imply it is part of the repertoire in the *theoretical technology* (*pace* Lucas, 1981, p. 9) within the citadels of the newclassicals.

It is in these senses that every nihilistic claim by the newclassicals is totally ideological – precisely because it cannot be underpinned by 'rigorous' derivation on the basis of any kind of mathematical formalization. It is, in the wise words of a mathematician of supreme merit, who also contributed enlighteningly to mathematical economics (Schwartz, 1961, 1965), that:

> " Too large a proportion of recent 'mathematical' economics are mere concoctions, as imprecise as the initial assumptions they rest on, which allow the author to lose sight of the complexities and interdependencies of the real world in a maze of pretentious and unhelpful symbols."
> Schwartz, 1986, p. 23.

[10] Incompetence and ignorance of the varieties of mathematics and their many different kinds of mathematical and non-mathematical logical foundations and, indeed, non-logical foundations, is not a monopoly of orthodox economists. Nor are misconceptions on the foundations of models of computation confined to the nihilist advocates of rules in economic policy contexts. A typical – and regrettable – example of the latter case is Bjerkholt (2009), where even the notion of an algorithm, defined on the basis of Turing Machines, is comprehensively incorrect.

§4. TOWARDS A POLITICAL ECONOMY OF THE THEORY OF ECONOMIC POLICY

> "In any event, 'those animal spirits which,' as Trevor Swan once put it, 'cannot be bottled' are a vital part of the story and reflect *an honest imprecision as opposed to what is often only an artificial, rather forced, precision in much orthodox theory*."
>
> Geoff Harcourt (1980), p. 28; italics added. *Discussion*, **American Economic Review – Papers and Proceedings** (p. 28), Vol. 70, # 2, May, pp. 26-28.

Geoff Harcourt has, as always, precisely (sic!) captured the theme of this paper: no amount of mathematical formalism, of any variety, can 'bottle' the genie that is incompleteness and the spirit of undecidability.

On the other hand, if we are not reasonably faithful to the traditions of the classics of our subject, we may distort their culled wisdom and force them into the straitjacket of irrelevant mathematics. No better example of this can be found, in the frontier literature on macroeconomic theory and economic policy than the way the hallowed Wicksellian distinction between the money (or market) rate of interest and the natural rate of interest were interpreted. We have, on the one hand, the thoroughly misleading interpretation by Leijonhufvud (1981, p. 155; italics in the original) – thereby influencing Woodford[11] (2002):

> "The central concepts of Wicksell's analytical apparatus are, of course, *the market rate* and the *natural rate* of interest. The terms are names for two values of the same variable."

Nowhere in the Wicksellian classics, nor in any of the monetary macroeconomic writings of Lindahl or Myrdal have I found any evidence to substantiate this assertion. Indeed, Myrdal's claim – worked through with Lindahl's complete endorsement – in his classic of 1931 (Myrdal, 1931 [1939], p. 35) is diametrically opposed to Leijonhufvud's facile claim:

> "This monetary equilibrium, which is stated precisely with respect to a certain accrual or hypothetical price situation, has by no means the same character as the conditions of perfect general equilibrium of prices in the static analysis of price formation. Wicksell emphasised this."

These two conceptual visions imply quite diametrically opposite approaches to the theory and applications of policy – whatever mathematical formalism is, or was, used. In the first case,

[11] Despite claims to the contrary, there is no evidence whatsoever that this author has read any of the original Swedish texts that are referred to in the book.

the policy maker works with a benchmark model, the orthodox one, of variations of the SDGE type, with all the paraphernalia of stability, existence and uniqueness of one or another equilibrium, with some one or other efficiency property. In the other case, the driving force in the macroeconomy is cumulative, unstable and can only be tamed by active, discretionary, interventions by the political authorities.

This is the reason why I have emphasized the mathematical vacuity of the claims by the adherents of *rules*, with their pretense of precision and objectivity. Underlying the formal mathematical models and their rules (sic!) of derivation, there is a wealth of economic tradition and history[12], conveniently selected and distorted to fit the needs of ideology and mathematical straitjacketing.

In what sense can the mathematics of ambiguity, incompleteness and undecidability be said to imply a return towards a political economy of the theory of economic policy?

I believe it is necessary to demystify the mathematical formalisms in which current orthodoxy frames its economic theory to give it an air of objectivity that it does not deserve – and, moreover, cannot carry in the foundations of the mathematics it uses. When this is done – and it can be done – and the economic theory of orthodoxy is shown for what it is, an ideological justification of particular vision and commitment to a political agenda, then it will be time to confront its policy prescriptions in the political sphere.

This is one route – perhaps even the only one – towards debunking ignorant assertions like those of Lucas (1987, pp. 107-8) and reasserting the essential incompleteness of economic theory:

> "If these developments [i.e., the reincorporation of aggregative problems .. within the general framework of 'microeconomic' theory] succeed, the term 'macroeconomic'

[12] As Sarvapalli Radhakrishnan eloquently framed it in his Hibbert Lectures at the University of Manchester (in 1929 & 1930, Radhakrishnan, 1932):

> "If we are not to lapse into individualistic rationalism and ultimate negation, if we are not to be led astray by our wandering whims, if our personal intuitions are to be guided by the accumulated wisdom of the race, only tradition can help us. It takes centuries of life to make a little history, and it takes centuries of history to produce a little tradition, and we cannot lightly set it aside ..... . But loyalty to tradition is one thing, and bondage to it quite another."

> will simply disappear from use and the modifier 'micro' will become superfluous. We will simply speak, as did Smith, Ricardo, Marshall and Walras, of *economic* theory."

I suppose it is a measure of success for a doctrinaire Chicago economist to be right about 50% of the time – given that they do not seem to have bothered to read Smith or Ricardo, not even as far as the title of these classics.

That would only be a first step in extolling the virtues of ambiguity in the interaction between politics and economics – and the second step would be a return to political economy and reverse the trend that was begun by the neo classicals – and being carried on, uncompromisingly, by the newclassicals.

Geoff Harcourt would (Harcourt, 2006, p. 157):

> "[T]that the post-Keynesian way does provide a relevant framework for thinking about both the light-bearing and the fruit-bearing aspects of what Keynes once called 'our miserable subject'. He immediately and always belied such a description with his own cheerful, optimistic and imaginative approach to the puzzles and issues that perpetually face us, its practitioners."

Geoff Harcourt's 'own cheerful, optimistic and imaginative approach' has always been a beacon of light in my struggles with the pretentious mathematical formalisms of orthodox theory – often clad in the *Emperor's New Clothes*.

REFERENCES

Alesina, Alberto. F (2007), *Program Report: Political Economy*, **NBER Reporter OnLine,** Number 3, pp. 1-5.

Bjerkholt, Olav (2009), *Some Unresolved Problems of Mathematical Programming*, chapter 1, pp. 3-19, in: **Economic Models: Methods, Theory and Applications**, edited by Dipak Basu, World Scientific, Singapore.

Frisch, Ragnar (1933), **Sparing og Cirkulasjonsregulering**, Fabritius og Sønners Forlag, Oslo, 1933.

Frisch, Ragnar (1949a), *Price-Wage-Tax-Subsidy Policies as Instruments in Maintaining Optimal Employment*, **Report to the United Nations Commission on Employment and Economic Stability**, UN Document E/CN.1/Sub.2/13, 18 April, 1949.

Frisch, Ragnar (1949b), *Mathematical Appendix to a Memorandum on Price-Wage-Tax-Subsidy Policies as Instruments in Maintaining Optimal Employment*, assisted by: Svein Brenna, Thor Johnsen & Sven Vigger, **Stencil memo 23 September 1949**, The University Institute of Economics, Oslo.

Grandmont, Jean-Michel (1985), *On Endogenous Competitive Business Cycles*, **Econometrica**, Vol. 53, # 5, September, pp. 995-1045.

Groenewegen Peter (1987 [2008]), *Political economy' and 'economics*, **The New Palgrave: A Dictionary of Economics**, v. 3, pp. 905-06 [Pp. 904–07].

Hansen, Bent (1955), **Finanspolitikens Ekonomiska Teori**, Studentlitteratur, Lund.

Harcourt, G. C (1972), **Some Cambridge Controversies in the Theory of Capital**, Cambridge University Press, Cambridge.

Harcourt, G. C (1980), *Discussion*, **American Economic Review – Papers and Proceedings**, Vol. 70, # 2, May, pp. 26-28.

Harcourt, G. C (1992), **On Political Economists and Modern Political Economy: Selected Essays of G.C. Harcourt**, ed., by Claudio Sardoni, Routledge, London.

Harcourt, G. C (2006), **The Structure of Post-Keynesian Economics: The Core Contributions of the Pioneers**, Cambridge University press, Cambridge.

Harcourt, G. C, & N. F. Laing (1971) (editors), **Capital and Growth**, Penguin Books, Harmondsworth, Middlesex.

Hirsch, Morris W and Stephen Smale (1974): **Differential Equations, Dynamical Systems and Linear Algebra**, Academic Press, New York and London.

Kydland, Finne. E & Edward. C Prescott (1967), *Rules Rather than Discretion: The Inconsistency of Optimal Plans*, **Journal of Political Economy**, Vol. 85, # 3, June, pp. 473-492.

Kydland, Finn. E & Edward. C Prescott (1982), *Time to Build and Aggregate Fluctuations*, **Econometrica**, Vol. 50, #6, November, pp.1345-1369.

Leijonhufvud, Axel (1981), *The Wicksell Connection: Variation on a Theme*, chapter 7, pp. 131-202, in: **Information and Coordination: Essays in Macroeconomic Theory** by Axel Leijonhufvud, Oxford University Press, Oxford.

Lindahl, Erik (1924), **Penningpolitikens Mål och Medel**, Förlagsaktiebolagets I Malmö Boktryckeri, Malmö.

Lindahl, Erik (1930), **Penningpolitikens Medel**, C.W.K Gleerup, Lund.

Lindahl, Erik (1952), Review of Readings in Monetary Theory, edited by Friedrich A. Lutz & Lloyd W. Mints, Econometrica, Vol. 20, # 3, July, pp. 506-8.

Ljungqvist, Lars and Thomas J Sargent (2004), **Recursive Macroeconomic Theory** (Second Edition), The MIT Press, Cambridge, Massachusetts.

Lucas, Robert. E, Jr. (1975), *Econometric Policy Evaluation: A Critique*, in: **The Phillips Curve and Labor Markets**, edited by Karl Brunner & Alan Meltzer, *Carnegie-Rochester Conference Series on Public Policy*, Vol. 1, pp. 19-46.

Lucas, Robert E, Jr., (1981), **Studies in Business-Cycle Theory**, Basil Blackwell, Oxford.

Lucas, Robert. E, Jr., (1987), **Models of Business Cycles**, Basil Blackwell, Oxford.

Lucas, Robert. E., Jr., & Tom. J Sargent (1979 [1981]), *After Keynesian Macroeconomics*, chapter 16, pp. 295-319, in: **Rational Expectations and Econometric Practice**, edited by Robert. E Lucas Jr., & Thomas. J Sargent, George Allen & Unwin, London.

Lucas, Robert. E, Jr., and Nancy L. Stokey (with Edward C. Prescott), (1989), **Recursive Methods in Economic Dynamics**, Harvard University Press, Cambridge, Massachusetts.

Myrdal, Gunnar (1933), **Finanspolitikens Ekonomiska Verkningar**, SOU 1934:1, P. A. Norstedt & Söner, Stockholm.

Myrdal, Gunnar (1939), **Monetary Equilibrium**, William Hodge & Company Limited, London.

Phillips, A.W (1950), *Mechanical Models in Economic Dynamics*, **Economica**, New Series, Vol. 17, # 67, August, 1950; pp. 283-305).

Phillips, A. W (1954), *Stabilisation Policy in a Closed Economy*, **The Economic Journal**, Vol. 64, #254, June, pp.294-323.

Phillips, A. W (1957*), Stabilisation Policy and the Time-Forms of Lagged Responses*, **The Economic Journal**, Vol. 67, #266, June, pp.265-277.

Prescott, Edward. C (2004), *The Transformation of Macroeconomic Policy and Research*, **Nobel Prize Lecture**, Stockholm, December, 8.

Preston, A. J & A.R. Pagan (1982), **The Theory of Economic Policy: Statics and Dynamics**, Cambridge University Press, Cambridge.

Radhakrishnan, Sarvapalli (1932), **An Idealist View of Life**, Unwin Books, London.

Ramsey Frank Plumpton (1927), *A Contribution to the Theory of Taxation*, **Economic Journal,** Vol. 37, # 145, March, 47-67.

Ramsey, Frank Plumpton (1928), *A Mathematical Theory of Saving*, **Economic Journal,** Vol. 38, # 152, December, pp. 543-559.

Samuelson, Paul Anthony (1969), *Foreword,* (pp. vii-xii) to: **Capital and Development Planning** by Sukhamoy Chakravarty, The MIT Press, Cambridge, Massachusetts.

Sargent, Thomas. J (1987), **Macroeconomic Theory** (Second Edition), Academic Press, INC., London.

Sargent, Thomas. J & Neil Wallace (1976), *Rational Expectations and the Theory of Economic Policy*, Journal of Monetary Economics, Vol. 2, #2, April, pp. 169-183.

Schwartz, Jacob. T (1961), **Lectures on the Mathematical Method in Analytical Economics**, Gordon and Breach, New York.

Schwartz, Jacob. T (1965), **Theory of Money**, Gordon and Breach, London.

Schwartz, Jacob. T (1986, [1962]), *The Pernicious Influence of Mathematics on Science*, Chapter 3, pp. 19-25, in: **Discrete Thoughts: Essays on Mathematics, Science and Philosophy** by Mark Kac, Gian-Carlo Rota and Jacob Schwartz, Birkhäuser, Basel.

Theil, H (1965), **Economic Forecasts and Policy**, North-Holland Publishing Company, Amsterdam.

Tinbergen, Jan (1952), **On the Theory of Economic Policy**, North-Holland, Amsterdam.

Velupillai, K. Vela (2008), *The Mathematization of Macroeconomics: **A Recursive Revolution***, **Economia Politica**, Vol. XXV, # 2, August, pp. 283-316.

Velupillai, K. Vela (2010), **Computable Foundations for Economics**, Routledge, London.

Velupillai, K. Vela (2011), *The Phillips Machine and the Epistemology of Analogue Computation*, **Economia Politica**, Vol. XXVII, pp. 39-62, *Special Issue*,

Wicksell, Knut (1936, [1898]), **Interest and Prices: A Study of the Causes Regulating the Value of Money**[13], (Translated from the German by R.F.Kahn), Macmillan and Co., Limited, London.

Woodford, Michael (2003), **Interest and Prices: Foundations of a Theory of Monetary Policy**, Princeton University Press, Princeton, NJ.

[13] The full subtitle is also given to make sure that the modern reader is disabused from the danger of believing that *Wicksell's classic* is a minor precursor to **Interest & Prices** by Woodford (1903), whose subtitle is the *seemingly* deeper one of seeking *The Foundations of Monetary Policy*.