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## DISCUSSION PAPER SERIES

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### *HUMBUGS* and other Exotica

*Celebrating Anwar Shaikh\**

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“However, we cannot assess the adequacy of theories by counting footnotes<sup>†</sup>. What I should like to do here is to consider the logical and theoretical status of the production function evidence.”

Simon, 1979, p. 461

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\* Revised version of a paper presented at the *Symposium in Honour of Anwar Shaikh: Surrogates, Humbugs and other Pseudo-Production Functions*, held in Trento, on 23<sup>rd</sup> May, 2012, to remember the 50<sup>th</sup> anniversary of Paul Samuelson’s *Parable and Realism in Capital Theory: The Surrogate Production Function*, *RES*, Vol. 29, # 2, June, 1962. The context of the *Symposium*, sponsored by the *Algorithmic Social Sciences Research Unit (ASSRU)*, Department of Economics, University of Trento and the *Fondazione Pescarabruzzo*, was, of course, Anwar Shaikh’s 1974 classic, *Laws of Production and Laws of Algebra: The Humbug Production Function* (Shaikh, 1974). I was introduced to this classic, even before it was officially published, by Geoff Harcourt, in 1974, long before I could really appreciate its theoretical significance. The irony of all this resides in the fact that my own first published paper (Velupillai, 1973) was an innocently ignorant attempt at attributing priority to Wickcell on the use of the Cobb-Douglas *Humbug*! As for the word *Humbug* itself, I was fully cognizant of its meaning, having been constantly exposed to its indiscriminate use – as it appeared then, almost sixty years ago - by my Mother, in my childhood, growing up in post-colonial Colombo. In preparing this paper – and in organizing the conference - I was unselfishly, even enthusiastically, helped by my three ASSRU colleagues, Professor Stefano Zambelli, Ms. Ying-Fang Kao and Mr. Ragu Ragupathy. Naturally, none of the infelicities in this paper are anyone’s responsibility but my own.

<sup>†</sup> Simon is referring to the 345 (sic!) references in Walters (1963).

## §1. A Prologue

“[D]ata is never just a collection of pre-existing facts. *Theory always intervenes*, not merely in the interpretation of events, but in their very *construction* (and occasionally in their *suppression*, as we know only too well). ....  
... *Data is never innocent.*”

Anwar Shaikh (2013): *Introduction* (pp. 4-5; italics added)

In a personal letter to Sraffa, soon after reading **Production of Commodities by Means of Commodities** (Sraffa, 1960), John Hicks wrote:

“Economic theory (teachable economic theory, at least) was getting just a bit boring lately: for the second time in your life you have livend it up again. Thank you.”  
Hicks (1960)

Sraffa ‘livened’ up ‘economic theory’ first in 1926 (Sraffa, 1926) and, then, for the second time, thirty four years later, in 1960. Shaikh did so, first in 1974 (although the first version saw official light of day two years before that<sup>1</sup>) and, now, almost forty years later with his *magnum opus* (Shaikh, 2013), which is, surely, to become a classic critique of every kind of orthodox complacency in economic theory. Many monographs and articles reflected on ‘Marx after Sraffa’, ‘Keynes after Sraffa’ – extending to copycat inanities like ‘Keynes after Lucas’, and so on. There should have been, with more reason, pungent essays on ‘Surrogates after Humbugs’ – but there were none; I hope there will, however, be serious reflections on Political Economy after Shaikh (2013), for it is a serious and immanent critique of the political and value theoretic foundations of orthodox economic theory, capable of ‘livening up’ a complacent, somnambulant, economic theory.

Over the many years in which I have felt educated and enlightened by reading Anwar Shaikh’s systematic writings on foundational issues, mostly of macroeconomics, but recently also of microeconomics (Shaikh, 2012), it has seemed to me to be possible to summarise (the unsummarisable) his guiding, disciplining, analytical concerns under the following eight categories<sup>2</sup>.

1. The Determination of Prices & Profits
2. The Impact of Technical Change on Profitability
3. The Political Economy of National Income Accounts

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<sup>1</sup> The poignant, even melancholy, saga of the vicissitudes of that classic by a youthful Shaikh is sympathetically narrated in Harcourt’s wonderful contribution to this *Special Issue of Global & Local Economic Review* in honour of Anwar Shaikh, also commemorating the award of the *Fondazione Pescarabruzzo NordSud Award in the Social Sciences*, for 2013, to him.

<sup>2</sup> I rely on Shaikh (2000) for this and the immediately following characterisations of his visions, work and framework for analytical economic theory.

4. The Impact of State Taxation and Expenditures on Labour Income
5. On the Macrodynamics of Effective Demand in a Growth Context
6. On a Classical Explanation of Inflation
7. On a Classical Explanation International Trade and Exchange Rates
8. On the Determination of Stock Prices and Interest Rates by means of the Equalization of Profit Rates across Sectors

The central concerns of Shaikh's theoretically based empirical work has been the attempt to understand the fundamental processes at work in advanced capitalism, categorized in the answers he seeks for the following questions:

- i. How do market economies work, and why do they generate certain patterns which seem to cut across differences in origin, in culture, and even historical epochs?
- ii. Why is capitalist growth characterized by order-within-disorder, periodically punctuated by episodes of general economic crisis?
- iii. Why is unrestrained capitalist development so typically uneven across nations, across regions, and across individuals?

In approaching such questions, he claims to have always found it crucial that one start from a solid theoretical foundation grounded in the actual phenomenon of the object of one's investigation.

This vision has now seen a welcome appearance in the form of the monumental new monograph (Shaikh, 2013), for which many of us have been waiting a long time.

I do not aim, in this very modest essay, to survey the vast canvas on which Shaikh has sketched his philosophy and methodology of analytic economic theory. I try only to 'pick & choose' a few choice items from that panorama of vistas, comment on them, 'here and there', and scrutinize them critically from one or another point of view – one that will not be strange or uncomfortable for him

Thus, the next section is a brief 'excursus' on the HUMBUG and its distinguished predecessors. In section 3 I indulge in some elementary and exotic adventures in the nonlinear dynamics used in Shaikh (2005). A similar exercise is attempted on the basis of my reflections on Shaikh's provocative and important essay on 'Rethinking Microeconomics'

(Shaikh, 2012) and his recent allegiance to *reflexivity* (Shaikh, 2010) – in the senses given to it by Soros (2008) – and *emergence*.

I am, of course, well aware that this is an exercise in *scratching* a deep and complex *surface*, from which I am attempting to infer and interpret visions and vistas of a seriously committed scholar.

## §2. The HUMBUG and (Some of) its Precursors

“In the critic's vocabulary, the word "precursor" is indispensable, but it should be cleansed of all connotations of polemic or rivalry. The fact is that every writer *creates* his own precursors. His work modifies our conception of the past, as it will modify the future.”

Jorge Luis Borges: *Kafka and his Precursors*"

It is not often explicitly recognized that the unfortunate – and, as Shaikh has amply demonstrated, untenable – ‘Cobb-Douglas’ production function formulation originated in one of Wicksell’s lesser known (most likely because it was in Swedish) contributions to economic analysis.<sup>3</sup> Moreover, it is – in spite of sterling efforts by Shaikh, Simon, Phelps Brown and a host of others – more often forgotten that Paul Douglas actually tried to find a functional formulation to ‘explain’ *the constancy of the wage share in total national income* (output).

That it was transmogrified into a production function of a particular linear homogenous specification – eventually turned into the infamous and ubiquitous Cobb-Douglas formulation – was entirely due to a conjunction of an apologetic theory of distribution – the neoclassical marginal productivity theory of functional income distribution – and a particular interpretation of *Euler’s theorem on homogeneous functions*.

Thus it was that Anwar Shaikh returned the issue to its ‘womb’, so to speak:

“What is not obvious is, however, is that so long as aggregate shares are constant, an aggregate Cobb-Douglas function having apparently ‘constant returns to scale’ will always provide an exact fit, *for any data whatsoever*.”

Shaikh (1974), p. 116; italics added.

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<sup>3</sup> Wicksell (1900), pp. 305 – 337, although it was already mentioned in a letter to his younger colleague, Gustaf Steffen one year earlier (cf. Gårdlund, 1958, p. 331). To Wicksell’s credit, it must be pointed out that he never used ‘capital’ as one of the factors of production, in his specification of a production function with what is now known as the Cobb-Douglas formulation. His factors of production were, true to his Austrian capital theoretic ‘heritage’, land, labour and time.

His dramatic use of *The Humbug Economy* (op.cit, p. 118; figure 1) to demonstrate this ‘truism’ seems not to have deterred legions of neoclassical economists from ascribing almost mystical powers to the production function. As Tjalling Koopmans – no unorthodox non-neoclassical by any standards – pointed out, almost pungently:

“With princely unconcern econometricians have continued to fit aggregate production functions approximating an aggregate output index, for an economy or a sector, by a function  $F(K,L)$  of aggregate labour (L) and capital (K) input indices. *When the matter of the logical foundations for such a construct is raised, words such as ‘parable’<sup>4</sup> or ‘metaphor’ are pressed into service.*”  
Koopmans (1977), p. 144; italics added.

Shaikh (and Simon<sup>5</sup>) questioned precisely ‘the logical foundations for [the Cobb-Douglas] construct.

Simon, in his joint paper with Levy (Simon & Levy, 1963), a decade before Shaikh, in his typically acute way, had come to almost the same conclusion<sup>6</sup>. But it was Phelps Brown who is the **Kafkaian precursor** à la Borges, to Shaikh’s *HUMBUG*:

“The Cobb-Douglas k, and the share of earnings in income, will be only *two sides of the same penny*.”  
Phelps Brown (1957), p. 557; italics added.

Legions of non-orthodox economists have replicated, strengthened and expanded Shaikh’s foundational result, but – to use Koopman’s felicitous phrase – ‘with princely unconcern’ neoclassical economists continue to litter textbooks, even formally advanced versions of them (eg., Romer, 2006), with production functions of the Cobb-Douglas form, ignoring comprehensively the facts of other side of ‘the same penny’. The ‘dishonour’ role of neoclassical economists who continue their ‘princely unconcerns’ include many who have gone on, and continue to go on, displaying utter disregard for foundational infelicities, when they come into conflict with ideologically grounded opinions, masquerading as ‘scientific

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<sup>4</sup> This is obviously a reference to Samuelson (1962).

<sup>5</sup> See the lead quote on the title page of this paper.

<sup>6</sup> As he pointed out with characteristic candour, in his letter to Marc Lavoie (Simon, 1985), fully over two decades after his own paper with Levy (ibid) and more than a decade after Shaikh’s classic (italics added):

“Professor Shaikh’s derivation is very similar to mine for the time series case. ... He starts with constant factor shares; I start with a constant saving rate and derive constant factor shares (assuming also a constant rate of interest). Hence our papers seem to me complementary in showing that the *spurious fit of the Cobb-Douglas will occur under even broader ranges of assumptions that each of us originally thought.*”

beliefs': all the way from Böhm-Bawerk and J.B. Clarke, to lesser contemporaries such as Levhari (1965), Romer (*op.cit*) and Brems (1977) – and the whole newclassical school, all of whom, without exception, feel quite comfortable with the dissonance between theoretical rigour (however defined) and empirical exercises.

That econometricians, with even less scrupulous standards, and much less allegiance to economic theoretic foundational consistency, indulge in fitting alleged aggregate production data to derive meaningful (sic!) exponents for the Cobb-Douglas specification should no longer be surprising. But that the practice has even spread to assuming Cobb-Douglas utility functions is nothing short of a theoretical scandal.

Shaikh's recent reflection (Shaikh, 2005, p. 447; italics added) on this dissonance perfectly summarises the issue:

“It is curious that a tradition so insistent on the necessity of micro-foundations should rely so heavily on a construction that cannot be derived from micro-foundations.

Defenders [like, for example, Brems (*op.cit*)] claim that aggregate production functions are worth retaining because they possess important virtues, and *because they appear to work at an empirical level.*”

What may be called the Simon-Shaikh concern for the ‘logical and theoretical foundations’ of empirical exercises is sacrificed, unceremoniously, on the altar of the ideology of a school of thought. Shaikh's work is in that noble tradition that was broached by Myrdal more than eighty years ago, questioning the so-called scientific status of economics, especially when integrity on questions of the *theory of value* are at issue (Myrdal, 1930).

The other side of the *utility penny*, by those who extend magical beliefs to utility analysis of choice, has *never*, to the best of my knowledge, been a subject of discourse even in non-orthodox circles.

### §3. ‘Nonlinear Dynamics and Pseudo-Production Functions’<sup>7</sup>

“It has long seemed to me that Volterra's problem of the symbiosis of two populations – partly complementary, partly hostile – is helpful in the understanding of the dynamical contradictions of capitalism, especially when stated in a more or less Marxian form.”  
Richard Goodwin (1967), p. 55.

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<sup>7</sup> This is the title of Shaikh (2005).

In an interesting exercise, Shaikh (2005, p. 448) compares two sets of data, one whose ‘generating process is transparent and strictly non-neoclassical’ and another ‘whose generating process is the object of dispute.’

There are, however, two problems with the ‘non-neoclassical generating process’. Firstly, it is not clear that it is unambiguously non-neoclassical, despite the claims of its original ‘architect’ – Richard Goodwin (as claimed in the lead quote of this section). Secondly, the ‘transparency of the generating process’ is not quite clear, for a very special technical reason.

The first issue is not of much concern for me, here, except in so far as to point out that Goodwin’s labour productivity assumption can ‘easily’ be replaced by a Cobb-Douglas production function so that the resulting dynamics in the share of wages and the (un)employment ratio displays, qualitatively, the same dynamics as the original model.

As for the second issue, it is rarely – if ever – recognised by the many non-neoclassicals who use Goodwin (1967) as a fulcrum around which to construct, and empirically investigate, a variety of questions of aggregate dynamics that the *discretisation* of the *continuous* nonlinear system of Lotka-Volterra equations requires delicate handling. Indeed, I know of NO application, in economics, of these equations, for empirical investigation of any kind of aggregate dynamics to be theoretically rigorous.

Moreover, the original dynamics of the Lotka-Volterra system is structurally unstable and, therefore, using it to generate data sets is fraught with too many sensitivities that are not easy to circumvent.

Consider the original Lotka-Volterra system of non-linear differential equations<sup>8</sup>

$$\frac{dx}{dt} = ax - axy \dots \dots \dots (1)$$

$$\frac{dy}{dt} = -cy + cxy \dots \dots \dots (2)$$

$$a > 0, c > 0$$

The ‘usual’ discretization of (1) & (2), for generating and studying empirical data, is:

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<sup>8</sup> They should really be described as ‘quasi-linear’. I shall rely heavily on the results and notations in Potts (1982), to which I was directed by Paul Samuelson, via his contribution to the Goodwin Festschrift, which I edited.

$$\Delta x_n = ax_n(1 - y_n)\Delta t_n \dots \dots \dots (3)$$

$$\Delta y_n = cy_n(x_n - 1)\Delta t_n \dots \dots \dots (4)$$

It seems to me that Shaikh has used the above [(3) & (4)] system of discretisations of (1) & (2) for the data generation process. Now, quite apart from the difficulties of using a structurally unstable system in *any* empirical analysis, it so happens that the above system of discretized equations, when used as the basis for analyzing the centre-type solutions of (1) & (2), generate, for  $a \neq c$ , ‘spurious solutions with negative  $x_n$  or  $y_n$ ’.

An intuitive way out of this difficulty would be to replace (1) & (2) by:

$$\frac{d}{dt}(x - \ln x) = -a(x - 1)(y - 1) \dots \dots \dots (5)$$

$$\frac{d}{dt}(y - \ln y) = -c(x - 1)(y - 1) \dots \dots \dots (6)$$

In the case of (5) & (6), the ‘usual’ discretisations can be used without any difficulty of spurious solutions and the like arising. However, the drawback here is clear: one loses the intuitive justification of an ‘understanding of the dynamical contradictions of capitalism, especially when stated in a more or less Marxian form,’ when (1) & (2) are replaced by (5) & (6).

Whether the non-neoclassical, ‘more or less Marxian form’ of the underlying economic model can be preserved, when trying to derive (5) & (6) as its – i.e., the economic model’s - ‘final equations’, remains a moot question.

**§4. Rethinking Microeconomics, Reflexivity and Disequilibrium Dynamics**

“If it [the foundation stones of microeconomics as it is taught today] is wrong, why not throw it away? Yes, I am throwing it away. I think the textbooks are a scandal. I think to expose young impressionable minds to this scholastic exercise as though it said something about the real world, is a scandal. .... I find that inexcusable.”

Herbert Simon (1997), p. 397.

My former colleague, at Queen’s University of Belfast, R.D.C Collison Black, distinguished scholar of impeccable intellectual integrity, once ‘lamented’ to me that he was ‘tired of being referred to as the *Jevons man*.’ It would be entirely understandable if Anwar Shaikh, as distinguished a scholar of equally impeccable intellectual integrity, felt slightly weary of being referred to as ‘*the HUMBUG man*’!

In recent years, now extending to over a decade and a half, Shaikh has broached new frontiers of analytical economic investigations, and contributed to them in enlightening ways, whilst remaining faithful to the vistas and visions I outlined in the opening section.

I identify three disciplining criteria informing Shaikh's current frontiers of research – of course there may well be more; or, indeed, my characterisations completely incorrect – in furthering the foundations of economic analysis, with solid grounding in empirical facts, sometimes euphemistically described as 'reality'. In all these, Shaikh, like Simon, shuns any and every kind of 'Armchair Economics'.

First of all, there is his lifelong concern with 'the fallacy of composition', which I have come to call the *Mereological Confusion*<sup>9</sup>.

Secondly, there is the increasing concern and emphasis in his writings for one or another kind of notion of *emergence* to be at the analytical core of the natural process analysis of his economics, whether it is macroeconomics or microeconomics.

Thirdly, he has come to advocate a particular notion of reflexivity, especially in the analysis of the financial-real nexus of economic dynamics, with some kind of microeconomic underpinning. The notion of reflexivity Shaikh seems to subscribe to is the one introduced by Soros (cf., for example Soros, 2008; italics added):

“As a way of explaining financial markets, I propose an alternative paradigm that differs from the current one in two respects. First, financial markets do not reflect prevailing conditions accurately; they provide a picture that is always biased or distorted in one way or another. Second, the distorted views held by market participants and expressed in market prices can, under certain circumstances, affect the so-called fundamentals that market prices are supposed to reflect. *This two-way circular connection<sup>10</sup> between market prices and the underlying reality I call reflexivity.*”

I subscribe to a different interpretation of both *emergence* and *reflexivity* and, therefore, also of the *mereological confusion* or fallacy (the *fallacy of composition*). My interpretation is a unified conception of all three, based on their foundations in Herbert Simon's kind of cognitive science. *Reflexivity*, for example, in this interpretation, is not about 'explaining' facts, whether observed in financial market behaviour or constructed theoretically. This alternative view is elegantly described by Cohen-Cole (2005, p. 122; italics added):

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<sup>9</sup> Mereology is the logic of part/whole relations.

<sup>10</sup> If only Soros was as versed in the history of economic thought and theory, as Shaikh is, he may have added the word 'cumulative' here, and would have found himself in the noble tradition of Wicksell, Myrdal and Kaldor, who several generations before him emphasized the vicious and virtuous nature of such 'reflexivities' in economic dynamics!

“[T]heory construction and creative problem-solving was the cognitive scientists’ model of *everyday thinking* and problem-solving. *Learning was not so much a process of acquiring facts about the world* as of developing a skill or acquiring proficiency with a conceptual tool that could then be deployed creatively... . For instance, according to ..... Noam Chomsky, ..... a child learning a language was *not acquiring specific words* so much as operating like a scientist by *actively developing a theory of how to speak properly.*”

It is this aspect of reflexivity that is developed by Herbert Simon in his lifelong research program in offering an alternative to the Armchair Theorising of orthodox economists.

Similarly, *emergence*, with its roots in the work of the *British Emergentists* and their underpinning of it in considerations of the *evolution of mind*, has a natural cognitive science basis.

As for the *mereological confusion*, in its cognitive science interpretation, it is best described in the context of neuroscience, especially since the reactionary, uncompromisingly reductionist nature of neuroeconomics:

“Mereology is the logic of part/whole relations. The neuroscientists’ mistake of ascribing to the constituent *parts* of an animal attributes that logically apply only to the *whole* animal we shall call ‘*the mereological fallacy*’ in neuroscience. The principle that psychological predicates which apply only to human beings (or other animals) as wholes cannot intelligibly applied to their parts, such as the brain, we shall call ‘*the mereological principle* ‘ in neuroscience. Human beings, but not their brains, can be said to be thoughtful or to be thoughtless animals; animals, but not their brains, let alone the hemispheres of their brains, can be said to see, hear, smell and taste things; people, but not their brains, can be said to make decisions or to be indecisive.

Bennett & Hacker (2003), p.22; italics added

If I may summarise this particular Simonian vision of the interaction and interdependence, from a cognitive science viewpoint, of the triptych of the mereological fallacy, emergence and reflexivity, than I may say, with confidence, it is about the evolutionary, disequilibrium dynamics, of economic processes, at any level.

The problem to be overcome by anyone subscribing to this cognitive scientific interpretation of the triptych is the danger of viewing such things as being *subjective*.

That, I think, is my task in my own collegial interactions with the supremely objective scientist that Shaikh is.

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