

## **DeLisle Worrell: What's wrong with economics**

Address by Dr DeLisle Worrell, Governor of the Central Bank of Barbados, to the Barbados Economic Society (BES) AGM, Bridgetown, 30 June 2010.

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### **Introduction**

Back in the sixties, when I began my career in economics, we were all too aware of the limitations of the discipline: it was static where the world was dynamic, it assumed competitive markets where few existed, it assumed rationality when we knew full well that economic agents were not rational (at least not by the definition economists use), the choice of first principles was always arbitrary and culture bound, economics had no way of dealing with changing tastes and technology, and much else besides. Econometrics was equally plagued with intractable problems: economic observations are never randomly drawn and seldom independent, the number of excluded variables is always unmanageably large, the degrees of freedom unacceptably small, the stability of significance tests seldom unequivocally established, the errors in measurement too large to yield meaningful results (when we could estimate their magnitude at all, that is), the proxies we always have to use instead of the theoretical variables unacceptably distant from the variables they are meant to represent.

So we understood that we could not rely entirely – or even mainly – on theory and tests to say anything useful about the real world. I love numbers, and it is obvious that to gain any insight about how an economy works you need to start with a theory, so theory and tests are part of the armoury I would expect to use. However, the writers who attracted me to economics – Arthur Lewis was a prime example – understood that theory was more than a set of equations and some algebraic manipulation, and that empirical economics was not about “proving” a theory, but rather about using data to enrich one’s intuition about how the economy works. Also, they understood that most of what explains economic processes and interactions cannot be captured by the algebra and calculus that economists have at their disposal.

Over the past 4 decades I have become increasingly dismayed as I have observed the economics profession being taken over by a generation of economists who have lost sight of the limitations of what they can know, with the help of the tools and techniques available to us. We write as though anything that we can set down in a theoretically “correct” specification of an equation has to be true, even when the evidence to the contrary is right before our eyes, and obvious to everybody who is not an economist. When our empirical tests fail to yield expected results we do not take our theory back to the drawing board, but we fudge some explanation that we think might be plausible.

These are not trivial matters. They lead economists to incorrect interpretations of economic motivations, transactions and processes, and, as a result, to policy recommendations that can be guaranteed to fail. I offer two examples.

### **The exchange rate is not a price of anything**

Economists cannot understand how the exchange rate of small resource poor countries like Barbados, Cayman, the Bahamas and the OECS can remain unchanged in terms of their numeraire (the US dollar) indefinitely, because they deceive themselves into thinking that the exchange rate is a price. Economists believe that prices are arrived at by demand and supply in a market, and since the demand and supply will change over time, then the price has to change as well, otherwise the market will not clear. So they have to invent some artifice to

explain long term exchange rate pegs, especially in countries like the OECS that have no exchange controls.

But in fact the mistake is to believe that the exchange rate is the price of foreign exchange. You can't eat, drink, smoke or wear foreign exchange; foreign exchange is not a commodity. Rather, the exchange rate is what it says on the tin, a statement about the relation between one measure of value and another. The value of the shirt I bought at Havana Nines in Miami airport for US\$50 is twice that amount in BDS\$, because the exchange rate of the US\$:BDS\$ is 1:2. In exactly the same way that a 10 mile walk is equivalent to a walk of 16 kilometers, because the "exchange rate" of miles to kilometers is 1.6:1. It makes as much sense to keep changing the exchange rates between currencies as it would to keep changing the value of a mile in terms of a kilometer. The only outcome of flexible exchange rates is increased uncertainty, with no benefit whatsoever.

This is obvious to ordinary people, but to modern economists it is preposterous. No matter that it is confirmed by observation the world over. Not just in the Caribbean, but in regions scattered across the globe, there is a tendency for currencies to cluster around large attractors in their neighbourhood; in Europe it is the euro, in the Americas the dollar, in Southern Africa the rand, in the Indian Sub-continent the rupee. It is the notion of flexible exchange rates that is ridiculous, not the acceptance of the superiority of pegged exchange arrangements. We should remember that the notion that flexible exchange rates are an acceptable way to manage the international economy has risen to ascendancy only in the last 3 decades or so, a period I believe will be seen by history as a dark age of economics.

### **Prices have not been set by markets since the end of the agrarian economy**

A second example of economists' misrepresentation of the world is the notion that prices are determined by an equilibrium of supply and demand in a market. This notion is so fundamental to economics that it is accepted without question, and not only by economists. A visitor from Mars would find this quite strange, because when he looked around him, he would be hard pressed to find anything resembling a market in which buyers and sellers negotiate the price of things bought and sold. In real life retail prices are always predetermined by the seller, and wholesale, producer and other prices are determined by contract.

This was not always the case. Economic history is not my specialty, but my understanding is that in the agrarian economy economic transactions typically took place via markets. The farmer would till his fields and raise his livestock five days a week, and on the sixth day he would load his produce on some form of transportation and take it to the nearest market town, where he would trade it with artisans, fishermen and other farmers who had products that he needed and that his household did not produce. In many African societies, I am told, the marketing is done by women. The seventh day was often the day of rest and recuperation, at least in the Western societies from whom we draw our traditions. In this economy, sellers will adjust their prices over the course of the market day to ensure that they dispose of the entire supply that they have brought to market.

This was the world in which the early economists like Adam Smith grew up, and these were the arrangements which they reflected in their models of the economy. It was a quite literal description of the behaviour they experienced every day. The overwhelming proportion of the populations lived in villages in the countryside, their daily activity for most of the week was production and consumption. Trading, that is, economic exchange, took place only on a single day, in a discrete space, for a specified time. It made sense to think of economics as the business of trading in markets.

Unfortunately, the timing was all wrong. Economics was born at the sunset of the agrarian age, and at the birth of an industrial age in which the nature of economic transactions was completely transformed. The founding fathers of our discipline invented theories for a world

which was about to vanish from history. In the industrial society, a category to which Barbados and most of the Caribbean rightly belong, the overwhelming proportion of the population lives in conurbations, where people live, work, produce, consume and conduct economic exchange in the same space, and contemporaneously. In the agrarian economy the worker tends his farm during the week, and goes to market on market day; in the industrial economy the hotel worker travels from home to workplace every day, and he or she may go supermarket shopping any day. In the agrarian economy the farmer takes his produce to market on market day, in the industrial economy he sells it on contract to the supermarket. In the agrarian economy goods and services are exchanged in the market on market day; in the industrial economy shops and businesses are open every day. In the agrarian economy each market is clearly defined in time and space; in the industrial economy there is no spatial restriction – commodities are exchanged right across the world – and there is no single defined period over which all transactions must be completed. Buyers and sellers make contracts for whatever period is mutually agreeable.

I have come to believe that economists have built a discipline for a world which has largely vanished, and that is why we have nothing sensible to say about the challenges that face the world economy today. Economics does not give you a straight answer about the price of oil or any other commodity, about the exchange rate of the euro to the dollar, about the impact of deficit reduction in EU countries, about the effects of interest rate changes by the Federal Reserve, about the motivation for stock market fluctuations, or about any other economic question of interest. It is true that there is a dominant position in the economics profession on each of these issues, but that dominant view has proved badly wrong, and persistently so.

I now believe that we need a new paradigm in economics, one that is appropriate to how individuals and societies conduct economic exchanges in an industrial society. I am not alone in this view. Some of you will be familiar with the *Real World Review*, and online journal which was born of a graduate student revolution against the absurdity of conventional neoclassical economic explanations of the world. Just recently I have read a provocative book entitled *The Origin of Wealth*, which challenges what its author, Eric Beinhocker calls “Traditional economics”, and proposes that it be replaced by a new paradigm, “Complexity economics”. His argument is fascinating, and I now propose to spend a little time talking about some of the things I have gleaned from it.

### **Economics uses the laws of physics as they were known in the *nineteenth* century**

“As I write this, the field of economics is going through its most profound change in over a hundred years. I believe that this change represents a major shift in the intellectual currents of the world that will have substantial effects on our lives and the lives of generations to come. ...just as biology became a true science in the twentieth century, so too will economics come into its own as a science in the twenty first century”. This is how Beinhocker opens his preface. His book makes a first stab at establishing the scientific foundation of economics, arguing that economies evolve by the same laws as those that govern biological evolution.

Early in the book Beinhocker describes a cross-disciplinary workshop on economics, arranged by Citicorp’s CEO John Reed, that brought together ten leading economists (including Nobel Laureate Kenneth Arrow) and ten physicists, biologists and computer scientists. The physical scientists were “really shocked” to find that “economics was a throwback to another era” (page 47). Economists’ mathematics [seemed] “like a blast from the past”, and physical scientists were surprised by economists’ assumptions, objecting particularly to the assumption of perfect rationality. Physical scientists craft their assumptions to ensure that they do not contradict reality, though they are designed to simplify it. The assumption of perfect rationality contradicts reality, and economists know that, but they still use the assumption, however modified.

Beinhocker argues that what he calls Traditional Economics (TE) remains trapped in a time warp defined by the concepts that Leon Walras borrowed from the physics he knew at the time of the development of the marginalist theory of market economics which underpins the classical, keynesian, neoclassical and new keynesian views of the world. At that time only the first law of thermodynamics – the conservation of energy – was known. The notion of equilibrium is a form of expression of the first law. Physics subsequently discovered the second law – that entropy (disorder or randomness) is always increasing. The implication of the second law is that if the system were ever to reach equilibrium it would be dead. In effect, TE classifies economy as a closed equilibrium system, which violates the laws of physics, as they are now known to exist.

Beinhocker proposes an alternative to TE, which he terms complexity economics, CE. The complex economy evolves according to the same laws as does biological evolution. Evolution is an algorithm for finding “fit” designs in enormous design spaces. It has been described as “creating design without a designer”. Three elements feature in the evolutionary process: *variation* within the population, *selection* of the fittest, and *replication* of the successful design. In Beinhocker’s schema, *business plans* are the selection process by which the fittest physical technologies (PTs) and the fittest social technologies (STs) are selected and replicated.

PTs are methods and designs for transforming matter, energy and information from one state into another in pursuit of a goal or goals. In the case of the economy, business goals are to be profitable and to have the resources to grow and cope with change. The evolution of PTs combines induction (learning from experience) with deduction (drawing inference from theory and observation). Technology evolution is the result of humans’ deductive tinkering search through the near infinite possibilities of PT space. The invention of science, which derives laws from theories which are tested repeatedly under controlled conditions, dramatically increased the hit rate of deductive insights.

STs are methods and designs for organising people in pursuit of goal or goals. They may include institutions, structures, roles, processes, and cultural norms. Fit ST designs are those which enable people to play non-zero-sum games, and to capture the gains. Such designs require 1) that there be the potential for non-zero-sum games; 2) that payoff schemes provide incentives to play the game; and 3) that techniques are in place for sanctioning anyone who thinks of defecting.

Beinhocker concludes that viewing the economy as a complex adaptive system provides us with a new set of tools, techniques and theories for explaining economic phenomena. These include the concepts of design spaces, the processes of evolution just mentioned, and the notion of “fit order” which makes for successful PTs and STs. The author gives examples of how deductive and intuitive processes can be employed to improve the success rate in selecting the fittest PTs and STs. He admits that his is not the definitive statement of the new paradigm, but he hopes to have established the foundation of an economics which, in contrast to what we have at the moment, has a legitimate claim to be viewed as scientific.

### **Learning to observe the world as it really is**

Whether complexity economics will survive the assault that the practitioners of TE may launch, and emerge as the paradigm shift we need remains to be seen. In the meantime there is much that economists can do to make ourselves and our discipline a little more useful. One thing we can do is pay close attention, especially to data. Economists now have access to enormous amounts of data on countries across the world, from the IMF, the World Bank, the UNDP and other institutions that provide data online, much of it free of cost. We have regional comparative data from the CCMF, UN-ECLAC and others. And we have a rich data mine on Barbados, in the form of statistics compiled and published by the Central Bank of Barbados over 35 years or more. We have data on every aspect of the economy, often at a quite disaggregated level, particularly for the financial sector. We have annual series,

quarterly series, monthly series, even daily data series. Yet you would never guess that this rich data mine exists, judging from the papers you see published in journals, which invariably use the same handful of variables for study after study.

One of the great tragedies of the past few decades is the neglect of the huge and very complex structural macroeconomic models which were built in the 1960s and 1970s, in university research institutes and at central banks. These models were so interconnected that it was difficult to pinpoint what was causing what, and the variables and equations did not have nice statistical properties, so they were shut down on the orders of the high priests of econometric rigour. Or if not shut down, they remained undeveloped and neglected. With a few exceptions, among them, thankfully, the forecasting model used by the Central Bank of Barbados. Although even that model has not received the attention it deserves, to develop its rich possibilities.

My admonition to all of us is to maximize the use of data: use the highest frequency you can find, the longest series you can source, the most precise specification of variables. Don't let's stay on the surface, confining ourselves to aggregates; let's drill down to the components, the sectors and subsectors. Let us observe carefully, and respect what the data appears to be telling us. If the data is saying the opposite of what we expected, we need to take everything back to the drawing board – our theory, our choice of variable, how we measure variables, our choice of proxies, and the most likely candidates for inclusion among the excluded variables. We have to start with a hypothesis, in order to make a selection of data to examine, but we must be very careful not to maintain our hypothesis in spite of the evidence.

### **Replacing the GDP with the HDI**

When we are comparing among countries we should always use the HDI instead of GDP. We all repeat the mantra that the GDP by itself is not a reliable indicator of the quality of life in any society. Up until a couple decades ago, we could add “but we have no other indicator that is available for a range of countries”, and go on blithely to draw confident conclusions on the basis of an admittedly faulty number. With the annual publication of the HDI we no longer have an excuse, and the failure to employ the HDI universally in comparisons among countries is inexcusable. It is admittedly a flawed indicator, but it is enormously superior to GDP, in representing the real world. It compensates for differences in the purchasing power of the same value of domestic product in different countries, and it incorporates two vital social indicators, health and educational status.

### **Discarding unscientific practices**

There are no laws in economics. A law in the physical sciences, as Beinhocker reminds us is a *universal regularity with no known exceptions*. There is nothing in economics which meets that standard. What we have are theories: explanations for why regularities exist and explanations of how they work. We need to desist from writing papers that “prove” theories; they always turn out to be mathematical exercises of no practical relevance, yielding no insight about how the economy really works. In our empirical work we must accept the reality that the limitations of model specification, measurement error, choice of proxy variable, etc are so formidable that we can never “prove” anything in economics by appealing to the numbers.

### **Replacing slavish reverence for maths with methodological eclecticism**

Human behavior is simply too complex and nuanced to be fully represented mathematically, at least with the maths known to modern man. Maths can help us to gain insight into economic processes, but it is not the only way to gain such insight, nor even the most

productive. I have recently spent time thinking about price formation, the subject of an ongoing project, coordinated by Professor Roland Craigwell for the CCMF, in which I am involved. Two sources from which I have gained rich insight about the formation of prices are the unintended inflationary consequences of the imposition of the VAT in Barbados, and a short story by the brilliant Jamaican author Anthony Winkler, entitled “The man who knew the price of fish”.

### **Concluding remark**

You will all have heard the story of the madman under the street lamp. I first heard Trevor Eastmond with it, many years ago. Late one Friday night he was going down Broad Street and he saw this respectably dressed young man searching around under a street light. Curious, Trevor asked what was the problem. The fellow said that a Sir Grantley had slipped out of his wallet, and he was trying to find it. After a further minute or so of futile searching, Trevor said to the young man: “Let’s do this thing logically; exactly where were you standing when the \$100 bill fell?” The young man pointed off into the darkness, 20 metres away. Dumbfounded, Trevor asked the obvious: “But if the money dropped over there, why are you searching here?” “Because this is where the light is”. This, I submit, is how we often do economics. Our theories can’t deal with reality, so we ignore the real world and spend our time “testing” our theories. If economics is to have any advice to offer which is useful for the management of real economies, we must speak to the reality in all its rich complexity, using all the data we have, all the methodologies we can devise, and all the sources of insight we can borrow. We must dig as deeply as we can, and become sleuths in pursuit of deeper understanding of our economies, even if our search leads us into paths that are dark and uncertain.