

Roefie Hueting and Sustainable National Income

By Thomas Cool, August 24, 2001 *

Roefie Hueting (1929) put environmental economics right on the map in Holland in 1974, with his thesis “New scarcity and economic growth” written under promotor Jan Pen. In a sense he did so even for the world map, but the English translation had to wait till 1980 and then there were also publications by others.¹ Hueting was head of the environmental department at CBS Statistics Netherlands since 1969, and he saw to it from the start that the environment did not remain a theoretical exercise but was described statistically and made accessible for policy making. The high quality of the Dutch environmental statistics is world famous amongst statisticians. Subsequently, in the late 1980s, Hueting enriched economic science with the concept of sustainable national income (SNI). With Hueting we thus find theory and measurement linked and closely tuned.

National accounts

To understand Hueting’s work, we have to go back to the foundations of economic theory. The concept of ‘national income’ is founded in the theory of economic welfare. The concepts of general welfare and the national accounts have been developed in the period 1930-1960 by Tinbergen, Hicks, Kuznets, Samuelson, Bergson, Meade and Stone. Attention is focussed on the development of general welfare, while the importance of the production of goods and services is derived from this. For example, when more chairs are produced, then material production rises. However, welfare does not necessarily increase since there may be no need for more chairs.

While the main focus of interest is the measurement of general welfare, this becomes frustrated since the welfare function cannot be observed directly. It is for

* Econometrician, Scheveningen, Holland. This paper is a translation from “Roefie Hueting en het DNI”, included in the series ‘Key Figures in Economics’, Economisch-Statistische Berichten 24-8-2001, p652-653, NEI, Rotterdam.

¹ R. Hueting, “New scarcity and economic growth”, North-Holland, Amsterdam 1980. Dutch title: “Nieuwe schaarste en economische groei”.

this reason that income is used as an approximation, as this can be derived mathematically from the tangent plane to the utility function. If one assumes that the market is optimal, then observed market prices can be used to deflate this income. This is, in a nutshell, the economic theory that forms the foundation for statistical practice.

In the period since 1960 the theory itself seems to move more to the background, and for many the national product becomes the yardstick for economic success. That was the situation when Hueting started to consider the issue of the environment.

Environmental functions

Hueting’s first contribution to economic science is the concept of ‘environmental function’. A component such as water has different functions or applications, such as drinking, fishing or use in industrial processing. In this, a function is defined in relation to human needs. As one of few economists, Hueting delves in ecology, chemistry and physics, clarifies the various functions of the ecology, and subsequently identifies their economic meaning. Where environmental functions in the past were abundant and consequently did not have a price, nowadays they are scarce and do have a price. In the common calculation of national income, this increase in price is taken as an *increase in value* that causes a higher income. Here Hueting called attention to a major misunderstanding: these higher prices actually mean an *increase in cost*, so that real welfare decreases. Take for example an environmental disaster or the introduction of catalysts on cars. In these cases labour and tools are used to repair the damage. Hueting calls it asymmetrical, when on the one hand these costs are entered into the accounts and cause an increase in national income, while on the other hand the environmental damage is not subtracted. This asymmetry still is current statistical practice.

Demand and supply

By scarcity, environmental functions get a price. But do they get the right price? Is the assumption of market optimality satisfied? As a first step to answering this question Hueting tries to specify the functions of demand and supply. His analysis has gone through a development here. In his thesis he was able to determine a supply function for environmental functions based upon elimination costs of pollution and such. For a demand function, however, he had to refer to decisions by the government and ‘social forces’. He made a sharp distinction between consumer preferences and what turns up of those in government decisions, but he did not have a solution for the tension between the two.

When governments all over the world, in the wake of the Brundtland report of 1987, decided to adopt ‘sustainable development’, Hueting concluded that this

actually implied a 'vertical demand curve'. Seen from one perspective he only follows the governments, seen from another perspective he provides an economic foundation to the notion of 'sustainability'. Just like Hueting pointed out that sustainability actually means that the freedom of future generations to use environmental functions becomes the center of focus - where the concept of freedom is wider than the concept of income, just like Amartya Sen ² recently did.

Two questions

Hueting answers two questions with this analysis. First, one might think that initial statistical errors would disappear when environmental functions become scarcer and the prices rise, and when the environment thus becomes a cost factor and is integrated into the economic system. According to Hueting the statistical error does not disappear all by itself. As the example of the car catalyst shows, there is still a problem with statistical accounting. Secondly, one might think that the error should disappear in a democracy in which expenditure should be close to the social optimum. However, when governments on the one hand state a choice for sustainability, but on the other hand don't implement this in practice, and when they hence do not apply the prices that are required for sustainability, then the appeal to 'democracy' is also an appeal to inconsistency. Inconsistency does not provide a basis for statistical measurement. Hueting refers to the 'prisoners' dilemma' and other arguments of government failure by which the consumer preferences are 'blocked' and cannot be expressed in market prices. With respect to the two questions just mentioned, it therefore is a misunderstanding, according to Hueting, to think 'that the information is all right'.

A correct statistical description requires another figure alongside traditional national income, namely the distance to sustainable national income. In Hueting's view, both numbers are fictitious, since he considers it impossible to know the true preferences. Publication of both figures seems to him the best solution for meeting the need for information. That need for information is clear from the discussion in society.

Revolution in statistics

Concerning the calculation of the distance of NI to SNI, Hueting actually performs a small revolution in statistics. He namely uses a *model* as an integral part of *observation*, and in this model expectations with respect to the future play a key role. Many people regard statistics as only the observation and recording of phenomena in the past. For Hueting, however,

² A. Sen (1999), "Development as freedom", Knopf, New York

theory leads to the insight that the use of a model cannot always be avoided.

Recently, the SNI according to Hueting's methodology has been calculated for Holland. ³ This calculation was carried out for 1990, which underlines that Hueting, as a statistician, is interested in the past, namely 1990, and not 2010. The model contains a development path to the future, with valuations by the generation of 1990 of the positions of future generations. It is striking that in this way expectations and preferences concerning the future are used to estimate a figure for the past. The approach as such is consistent, though.

The calculation incidently shows that Dutch SNI is less than half Dutch NI, which would mean that the Dutch generation of 1990 lived in too grand a style and passed on too many costs onto future generations. These figures are likely to appeal more to one's imagination when more data points can be compared, with a monitoring of the distance between NI and SNI. Calculation of SNI incidently appears not all that expensive, for it is a calculation at a high aggregate level, that uses data that have already been collected for other purposes. Therefore, regular calculation appears to be possible in practice.

Conclusion

Hueting has the position of the statistician who sees it as his task to provide correct information. He is not only the theorist who goes back to Tinbergen and Hicks and he is not only the practitioner who introduces the required improvements in his field, but he is also the unwavering scientist who sticks to his role as supplier of information. ⁴

³ H. Verbruggen (ed), "Final report on calculations of a sustainable national income according to Hueting's methodology", Instituut voor Milieuvraagstukken, Vrije Universiteit Amsterdam, report O-00/10, 2000. A discussion in Dutch is in H. Verbruggen, R. Gerlagh, M.W. Hofkes en R.B. Dellink, "Duurzaam rekenen", ESB dossier "Vernieuwende statistieken", March 15 2001.

⁴ A longer version of this paper is available as "The seminal contribution of Roefie Hueting to economic science: Theory and measurement of Sustainable National Income", see <http://www.dataweb.nl/~cool/Papers/Environment/HuetingsContribution.html>. See also the 'Hueting Congres' book by E. van Ierland, J. van der Straaten en H. Vollebergh, "Economic growth and valuation of the environment: a debate", E. Elgar 2001, to appear by the end of September 2001.