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The Physiological and Physical Purchasing Power (PhPP) of Money

A Green and Walrasian Paradigm for Real Wealth Measurement

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Abstract

Current Purchasing Power Parity (PPP) comparisons have lost the link to walrasian analysis and do not sufficiently take account of today's lack of sustainability. Both concerns are remedied by PhPP, which stands likewise for "physiological purchasing power" or "physical purchasing power" of a currency. PhPP is the estimated exchange rate of a currency, at a given moment in time, with respect to a certain quantity of human metabolic life. Human metabolic life is defined in energetic terms and expressed in megajoules per year (MJ/a). The basic quantity measured in economics and finance is wealth, defined by Walras in terms of utility and limited availability. Applying the concepts and procedures used in scientific metrology to measurement of utility and limited availability results in a new green and walrasian paradigm of real wealth measurement. If real wealth is a cardinal quantity, it needs a scalar measurement unit. As utility is usually thought to be ordinal, cardinality of real wealth must come from limited availability. Limited availability refers to physical flows and is at the heart of sustainability analysis. Among all physical flows entering the economy, energy is the only one of extra-terrestrial origin, whose user efficiency determines the long term level of overall sustainable activity on the globe.

Empirical PhPP estimation is made by hedonic regression on food and energy price data collected for CPI and PPI. A pilot study for Switzerland in 2003 shows per capita real GDP to be 577 times the minimum cost of life. Choosing materially compatible units for real wealth, energy and utility allows formulating new viability conditions. Thus, maximum viable energy intensity (energy-to-GDP ratio) is bound by PhPP, and any viable homo economicus agent must have a minimum utility-to-wealth ratio. PhPP requires much less data than PPP and is therefore easier to implement than PPP. This could facilitate estimation namely for developing countries.

[1] This paper reflects a personal view and does not reflect the position of SECO