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THE THERMODYNAMIC ORIGINS OF WEALTH AND ITS IMPLICATIONS FOR INFLATION IN A DYING WORLD

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ABSTRACT

A widespread belief exists that human ingenuity can decouple the economy from environmentally damaging resource consumption, effectively letting us have our cake and eat it too. From a thermodynamic perspective this seems like magical thinking, even though it is true that the ratio of the GDP (Y) to annual energy consumption € has in fact increased with time. The underlying dynamics of the problem can be illuminated by considering the importance of past societal developments to the present, allowing that civilization was not built in a day. Like a growing child, our current collective consumptive demands developed from a positive imbalance between production and ever-present decay, sustained since our infancy. Supposing the imbalance responsible for growth can be related to the GDP, adjusting for inflation, then empirical evidence shows that the cumulative inflation-adjusted GDP summed over all of the past produces a wealth quantity that has been tied for the past half-century to E through a constant 5.50 +/- 0.21 trillion year-2019 US dollars per ExaJoule. The implication is that even quite distant cultural and technological developments guide future societal trajectories, or that inertia plays a much more important role in economic growth than generally permitted in traditional economic models. The inflation-adjustment is important. At some point, society will struggle to continue to grow energy demands. Such externalities as resource depletion and climate-change related decay will no longer support a positive imbalance. At this point, nominal economic production may remain, but available energy will be used imply to sustain that which was previously produced leaving little for further civilization expansion. What should be expected is a failing real GDP associated with rising inflation and a pathway leading to collapse.

Keywords: wealth, thermodynamics, origin, inflation, energy, GDP