

## The Laws of Econodynamics



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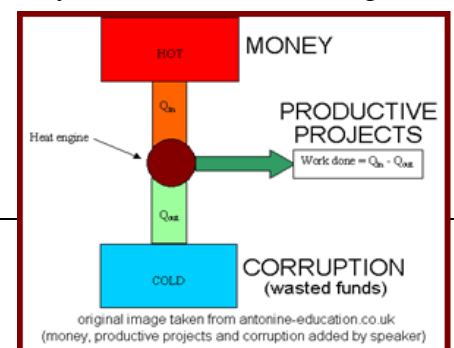
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**Abstract** – In this paper, the author draws analog of thermodynamics with economics by visualizing economic activity as a dynamical system, with money as the agent of change, employing techniques of dynamical-system analysis to model economic activity. In contrast to finance, economics, also, incorporates social costs, which could not be directly incorporated into the balance sheets. Often, the social factor introduces conflict of interest and corruption. However, the agents fueling economic activity (monetary assistance) want to ensure that their contributions end up into productive projects and not go down the drain through various modes of corruption. Money is, therefore, visualized as a substance-like quantity, the idea taken from the work of Bruno Schmidt. *The first law of econodynamics* may be stated as  $\Delta M = \Delta I + \Delta P$  (equivalent to the first law of thermodynamics  $\Delta Q = \Delta U + \Delta W$ ), where  $\Delta M$  is the money allocated for a project (thermodynamic equivalent to heat extracted from a hot reservoir,  $\Delta Q$ ), being, partially, utilized in infrastructure development,  $\Delta I$  (visualized as increase in internal energy,  $\Delta U$ ), and rest spent in providing services or products,  $\Delta P$  (work done by the system,  $\Delta W$ ). *The second law of econodynamics* states that money allocated for projects,  $M_{INV}$  (equivalent to heat extracted from hot reservoir — heat source), is used up for the genuine purposes, only partially, whereas the remaining leaks into the corrupt hands,  $M_{COR}$ , giving efficiency of project economy as

$$Efficiency = 1 - \frac{M_{COR}}{M_{INV}}$$

**Keywords** – Econodynamic model of corruption, Laws of thermodynamics, Money-flow modeling, Soft corruption, Steady state



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