

Report on “Conservation laws, financial entropy and the Eurozone crisis ”

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The article presents a fascinating re-interpretation of Marx’s theory of value by employing econophysics, in particular the concept of entropy, together with accounting identities. The final aim of the paper is to show that the origin of the European crisis can be traced back to the unsustainable process of accumulation in capitalist economies in the context of countries that cannot handle their supply of money. Although I am very sympathetic with the authors’ approach and intrigued by their idea, in my opinion the paper falls short in proving the point for three main reasons.

The first is that the presentation of the functioning a contemporary monetary economy is too simplified if not naive. Some examples. The problem of the dicotomy between value and price of goods was the main topics for classical economists (not only Marx). For the approach followed in this paper I would rather suggest the authors to consider Sraffa and his “Production of commodities by means of commodities”, which seems to me more suitable for the theory presented here. Anyway, I have the impression that the authors refer to an industrial economy but I wonder how much of their reasoning is applicable to a post-industrial system, when the financial sector accounts for a large percentage of the economic activity. As for the supply of money, in many points of the paper the authors seem to ignore the fact that credit supply and money supply are endogenous in contemporary economies. Almost all the central banks target the overnight interbank lending interest rate also because they are aware of their limit in controlling the supply of money. The fact that the Gold Standard was abandoned in the Seventies is a consequence of the problem in the current account balance of the US rather than in the limit to the production of gold. As for the interest rate, the authors, in presenting an example, quantify it as a premium on risk. Actually this is only a component of the interest rate, which adds to the market rate (according to the neoclassicals) or to the mark-up on the official interest rate (according to some Post-Keynesians), just to name some examples of more comprehensive explanations.

The second main problem of the paper is that the authors seem to fall again in one of the limits of econophysics, namely the interpretation of the mechanism of an economic system using conservation laws. Gallegati et al. [2006] remarked this issue, starting a large debate in the literature. The authors are definitely

more sophisticated in their approach than the works cited by Gallegati et al. [2006]. Nevertheless I have the feeling that this use of the conservation laws to explain the dynamics of financial capitalism is far from convincing, in particular for the representation of the supply of money, as I remarked above. The authors may want to take a look at Wagner [2011], who apply the maximum entropy to an economic model but avoid this inconsistency.

Third, the facts that the Euro crisis has been originated by trade unbalances that could not be corrected by the exchange rate and that the stability pact will have the only effect of worsening the situation are well established not only in non-neoclassical academic literature, but also in the general press (see for example a number of commentaries by Martin Wolf on the Financial Times). While reading I was expecting a more insightful contribution than the obvious observation that, if country is to reduce its liabilities, others will have to reduce their assets. These conclusions are not original and it is not clear to me what this paper adds with respect to this point.

I would advise the authors to reduce the scope (and the length) of the paper in order to better stress and motivate their contribution. In particular I would discard the references to the evolution of the monetary system and focus more on the parallel between the entropy laws and the classical theories of values. In doing so they should be aware of the limit of conservation laws in explaining monetary phenomena. Also, the argument would be strengthened by the inclusion of the results of the simulations of the model in the paper and by a comparison with the empirical evidence.

References

- Mauro Gallegati, Steve Keen, Thomas Lux, and Paul Ormerod. Worrying trends in econophysics. *Physica A: Statistical Mechanics and its Applications*, 370(1):1 – 6, 2006.
- Friedrich Wagner. Market clearing by maximum entropy in agent models of stock markets. *Journal of Economic Interaction and Coordination*, 6(2):121–138, 2011. doi: 10.1007/s11403-011-0079-9.