Short Communication

The Limit of Growth:
The Collapse of the Growth Function

By

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In 1972 D. Meadows published a study about the "Limits of Growth". This study exclusively related to economic growth on planet earth. This naturally results in having *followers* and *disputants* of the study (see Wikipedia). Now the time has come to candle this study theoretically and formulate a *natural law.*It is possible to prove that *all* growth processes in nature and society have an end. This can be derived as follows: When the financial economy has been established the big EULER sat down to understand how interests work. He developed a formula for the momentary interest rate (compound interest):

$$\lim_{n \to \infty} F(x) = \left(1 + \frac{1}{n}\right)^{nx} = e^x$$

(n is an integer: 1, 2, 3, 4 and so on)

The limit

$$\lim_{n \to \infty} \left(1 + \frac{1}{n}\right)^{n} = e$$

is the foundation of the growth function. It's a crooked, transcendental number which cannot be calculated exactly. Its first two digits are 2.7 . However, this number plays a huge roll in mathematics. This formula is also valid for the measurement unit of capital, e.g. 1€. For any starting capital, the following is true:

$$F(x) = F_0(x) e^x$$

Experience now shows that *every* growth function collapses. Beginning with the Theory of Relativity, you can derive and show the collapse of the growth function ((s .Roland Meissner: Die Weltformel. Ein Formulierungsvorschlag; Tönning: Der Andere Verlag, 2010. ISBN: 978-89959-990-9).

There, especially figure 1 is to emphasize which shows the collapse of *all* growth functions. If you insert the modified square root expression from the electrodynamics into former formula you get the following:

$$F(x) = F_0(x) e^x \sqrt{1 - \frac{e^x}{e^{x_0}}}$$

x_0 then is the critical yield upon which all capital is lost (F(x)=0). Pinpointing the exact critical yield certainly presents itself with some difficulty. One will have to use empirical values as a basis. The knowledge in itself that such a natural law exists weighs much. As an example, a purely theoretical process is illustrated:

There is an empty pond. On the first day, a water lily grows. On the second, two grow. On the third, four. On the fourth, eight and so on. The Pond is full on the thirtieth day. What day is the pond filled up half?

That's the riddle in the vernacular. Here, however, we look at a different aspect. What happens on the 31st day? The growth collapses because no further growth is possible since the pond is full. That is the fate of *every* growth, also of that of debt.

Reference

1. Otte, M.: Der Crash kommt; Ullstein Buchverlag, Berlin 2009