



Scientometrick of scientometric

Adedayo, A.V^{1,2*}¹Department of Materials Science and Engineering, Obafemi Awolowo University, Ile-Ife, Nigeria.²Department of Metallurgical Engineering, Kwara State Polytechnic, PMB 1375, Ilorin, Nigeria.

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ABSTRACT

This paper presents a study which examines the foundation of the present day scientometric as laid down by Derek de Solla Price in his award winning work: A general theory of bibliometric and other cumulative advantage processes, published in Journal of the American Society for Information Science. In the study, the importance of scientometric in research evaluation is identified, and a new concept of scientometrick is introduced. The error made and concealed in the trivial modification of the effect of contagion single-edged success introduced by Derek de Solla Price is exhumed with elucidatory discussion. The features of the Price's model do not seem to correlate well when compared with the real time situations in academic publishing process. Except that Derek de Solla Price stated so, it is doubtful that the Price's model is relevant and useful in real time bibliometric and academic publishing processes.

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Introduction

Research evaluation is gaining increased widespread attention allover the world (Bornmann, 2014). In the US and UK, the extent of the widespread attention has been identified to include the use of results of research evaluation in promotion and grants reception. Evaluation results are also used in ranking scientific outputs of researchers, laboratories, departments, institutions and countries. Due to the widespread importance, various types of methodologies are being developed and implemented as metric tools used in evaluation of research.

The prominent methodology adopted in evaluating research is scientometric. The foundation of scientometric was laid by Derek John de Solla Price in his work; A general theory of bibliometric and other cumulative advantage processes (Price, 1976; Clauset, 2013). This work of Derek Price was prominently supported by Eugene Garfield later on through the creation of Science Citation Index (SCI) (Garfield, 1979; Wouters, 1999). While there has been significant use of scientometric citation analysis in research evaluation (Sharma et al., 2013, Academia Publishing, 2013), however now, there is increasing critical view discouraging the use of scientometric citation analysis in performance evaluation (Thomson Reuters, 2014; Adedayo, 2013, Adedayo, 2014a,b,c,d, DoRA, 2013; Neophytou, 2014). Many problems have been identified in the present usage of citation analysis as performance metric tool.

In this present study, further identification of erroneous conception in the scientometric is made. The error identified is entrenched in the foundation of scientometric as laid by Derek John de Solla Price.

Scientometrick

Scientometric is a scientific field that studies the generality of science. It involves the quantitative study of science to investigate the impact of science communication, science policy, technology, innovations etc. It is also popularly referred to as the science and technology studies. However, by scientometrick, we mean the study of science tricks. Scientometrick connotes the study of deceptions, misrepresentations, falsehood, falsity,

untruth, deceit – TRICKS, concealed in science analysis, science communications and science in general.

Scientometrick of Scientometric

In: A general theory of bibliometric and other cumulative advantage processes, the article published in Journal of the American Society for Information Science, October, 1976; Derek J. de Solla Price laid the foundation of the present day scientometric. In the article, de Solla Price opined that it is common in bibliometric matters and in many diverse social phenomena, that success seems to breed success. "A paper which has been cited many times is more likely to be cited again than one which has been little cited. An author of many papers is more likely to publish again than one who has been less prolific. A journal which has been frequently consulted for some purposes is more likely to be turned to again than one of previous infrequent use" (Price, 1976). A trivial modification of the contagion success model was made to be single-edged so that success becomes more probable with previous successes. A modification of failure was also made to have no subsequent effect in changing probabilities, because failure does not constitute an event as does success. Thus lack of publication is regarded as a non-event, and only publication becomes a remarkable event.

In the de Solla Price model, it was supposed that an urn contains red and black balls. A red ball signifies a success and a black ball signifies a failure. For the Price model, it is supposed that after each drawing, the ball is replaced; if a red is drawn then c red balls are added, but if a black is drawn, no extra balls are put in the urn. If the initial composition of the urn contains b black balls and r red, the conditional probability of success after n previous successes is given as:

$$(r + nc)/(b + r + nc) \quad (1)$$

Where $(r + nc)$ is the total number of red balls in the urn after n drawings, and $(b + r + nc)$ is the total number of balls (both black and red) in the urn after n drawings. The corresponding conditional probability of failure is given as:

$$b/(b + r + nc) \quad (2)$$

Where b is the total number of black balls in the urn, after n drawings. Similarly, $(b + r + nc)$ is the total number of balls (both black and red) in the urn after n drawings.

This model was adapted and used by Derek de Solla Price to publication process in science communication. By adopting this concept, $(r + nc)$ red balls will be equivalent to the number of published authors, while b black balls will be equivalent to the number of unpublished articles. The total number of balls in the urn after n drawings $(b + r + nc)$ should be equivalent to the total number of authors in the pool of authors. However, the premise laid by Derek de Solla Price is that failure is accorded a status of non-event i.e. lack of publication and thus, should not be in the pool of authors. Therefore, the quantity b should not be in the denominator used in the de Solla Price's model. Herein, error was concealed through trickery and deliberate ingenious deception.

Conclusion

The error concealed in Derek de Solla Price model of contagion success has been identified and exhumed. The concept adopting equivalence of the pool of authors with an urn containing red and black balls is also seen to be erroneous. The features of the Price's model do not seem to correlate well when compared with the real time situations in academic publishing process. Except that Derek de Solla Price stated so, it is doubtful that the Price's model is relevant and useful in real time bibliometric and academic publishing processes.

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