**Impact Factor**

[The introductory part is a repetition of the previous note]

Productivity is the ratio of some output value to some input value. In some enterprises productivity can be measured with high precision. A factory can easily measure how many devices or items are produced per man-hour of labor. The term scientific productivity denotes the research output measured at individual, organizational or country level.

During earlier days, the scientific productivity was measured by just counting the number of publications. Say for eg. Scientist ‘A’ (or Country or Organization) has published 25 journal articles and 15 books whereas Scientist ‘B’ (or Country or Organization) has published 12 journal articles and 5 books. Hence, the Scientist ‘A’ is more productive than the Scientist ‘B‘. However, the widespread availability of Internet and related technologies has made publishing scientific articles and books very easy and hence, just counting the number of publications became insufficient to assess the scientific productivity. The scientific productivity in today’s scholarly world is determined based on citation analysis i.e. bystudying the impact and assumed quality of an article, an author, or an institution based on the number of times the articles/ journals and/or authors have been cited by others.

The most popular tools for measuring scientific productivity based on the citation analysis are the following:

 1. Journal Impact factor [ Explanation given in another note]

2. h-Index [ Explanation given in another note]

3. Scimago Journal and Country Ranking(SJCR)

4. Source Normalized Impact per Paper (SNIP)

Journal ranking provides an indication of an academic journal's influence and quality relative to other journals in their field. Journals may be ranked using a number of measures and the most popular among them is by calculating the Journal Impact Factor.The **impact factor (IF)** is a measure of the frequency with which the average article in a journal has been cited in a particular year.

Impact factor has been adopted for use as measure of journal quality based on the premise that: “the value of information is determined by those who use it” , the idea being that the value of a journal can be measured by the number of times its use is formalized in the form of a citation. There have been many innovative applications of journal impact factor.

**Definition**

Impact Factor is the ratio of the number of citations received by source items [articles, editorials, letters to the editor, short communications, corrections, notes, review articles etc. appearing in a publication] in a particular year to the number of source items published over a fixed period of time [usually two years] in a particular periodic publication, say a journal.

**How Impact Factor is Calculated?**

The calculation is based on a two-year period and involves dividing the number of times articles were cited by the number of articles that are published.

**E.g. Calculation of 2019 Impact Factor of a Journal**

 A = Total number of articles published in the journal in 2017 and 2018.

 B = The number of citations received by the journal during 2019.

 B/A = 2019 Impact Factor

**Origin and Development**

The Impact Factor was conceptualized by Dr. Eugene Garfield, the founder of the Institute for Scientific Information (ISI), USA during 1960’s as an aid to evaluate journals for inclusion in Current Contents and the Science Citation Index databases published by ISI. Later, M/s Thomson had acquired ISI and all its products in 1992 and merged with M/s Reuters in 2008 to form Thomson Reuters. Presently, the impact factor is calculated based on the citations received for the journals indexed in the Web of Science databases. The citation data from the web of science databases are published yearly by M/s Thomson Reuters as the **Journal Citation Report** (JCR).

**Variant Forms of Impact Factor**

Normally, impact factor is calculated for a period of two years. However, there are variant forms for impacts factor such 5-Year Journal Impact Factor and Journal Immediacy Index.

**5-Year Journal Impact Factor:** The average number of times articles from the journal published in the past five years have been cited. It is calculated by dividing the number of citations in a particular year by the total number of articles published in the previous five years.

**Journal Immediacy Index:**Citations to articles from the current year, divided by the total number of articles from the current year.

**Features of Impact factor**

1. The Impact Factor is a pure number and does not have any unit
2. The number is expressed upto three digits after the decimal e.g. 2.892
3. It is year-specific and because of various factors generally varies from year to year.
4. It is database-specific. To get impact factor, a journal must be indexed in any one of the Thomson Reuters Web of Science databases.
5. The value of Impact factor generally lies between zero and 50.
6. By and large review periodicals tend to have greater impact factors than research periodicals.
7. It also varies from subject to subject.
8. The impact factor indicates the standing of the journal in the world.
9. The impact factor may be considered as an indication of the quality of the journal in most cases.

**Applications and Uses**

With the passage of time impact factor is finding more and more uses. Some of them are:

1. **Selection of Journals for an organization**

While selecting journals for an organization, preference is given for those with impact factors as the impact factors clearly show the standing of a journal in the world.

1. **Discontinuation of a journal**

Now- a-days many a times organizations are forced to discontinue journals because of budget constraints and various other factors. So, the discontinuation can be based on the low impact factor.

1. **Market Research**

In market research, the impact factor provides quantitative evidence for editors and publishers for positioning their journals in relation to others in the field.

1. **Placing a Paper**

Every researcher would like to publish his paper in the most reputed journal in his field so that the paper comes to the notice of the researchers in his field world over. In such case, the list of journals arranged subject-wise according to impact factor will help him/her in selecting the journal.

1. **Academic evaluation**

Perhaps the most important and recent use of impact is in the process of academic evaluation. The impact factor can be used to provide a gross approximation of the prestige of journals in which individuals have been published.

**Advantages**

1. The calculation of impact factor is easily understood
2. It is an objective measure
3. In market research, the impact factor provides quantitative evidence for editors and publishers for positioning their journals in relation to the competition - especially others in the same subject category.
4. It provides librarians and researchers a tool for managing library journal collections.
5. As a management tool for library journal collections, the impact factor supplies the library administrator with information about journals already in the collection and journals under consideration for subscribing new.

**Disadvantages**

1. Journals with a large proportion of reviews may have a comparably higher IF, as reviews are, on average, cited more frequently than research papers.
2. The title / name change of a journal affects its impact factor value.
3. The impact factor is not necessarily a measure of the quality of a particular article in the journal, as relatively few articles in a journal contain the majority of citations.
4. Impact factors vary from one subject category to another within medicine and cannot be compared directly as, for example, large or rapidly-growing specialist disciplines have more researchers and publication organs.
5. Non-English-language journals have a relatively lower IF, as they attract less attention worldwide due to language barriers.
6. Basic research journals are rated higher than clinical medicine journals, as clinical medicine draws heavily on basic research.
7. Journals with free access to full-text articles (Open Access) have a comparatively high IF.
8. The Journal Citation Report (JCR) is very expensive
9. Journals that are less available to readers will almost never achieve a higher impact factor regardless of the quality of papers it publishes.
10. It can be used to provide a gross approximation of the prestige of journals in which individuals have been published.