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## **Publication Productivity of Nobel Laureate Jean Tirole: A Scientometric Portrait**

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### **ABSTRACT**

In this paper, an attempt has been made to brief out the publication activity of Jean Tirole a Nobel Prize winner in the field of Economic Sciences for the year 2014. Demonstrating a scientometric portrait of a renowned individual is a new dimension in the sphere of measuring the intellectual & research productivity of both the individual and the institution he/she serves (Padma and Ramaswamy, 2013). In this study authors presented a scientometric study of Jean Tirole, covering his 227 publications as reflected in Google Scholar in June 2017. The study reveals that: During his 36 years of productive age, the author has published 227 articles includes two languages (English and French). The year 1990 and 2000 has the highest number of publications with 11 articles (4.84 %) followed by 2004 with 10 articles (4.40%). The credibility of 58 (25.55 %) publications as first author and 136 (59.91 %) as second author indicates that being the first or the second author he is mainly responsible for the contents and productivity of 55 % publications. Tirole has collaborated with 442 co-authors.

**Keywords:** Jean Tirole, Scientometric portrait, Authorship status, Biobibliometrics.

### **1. INTRODUCTION**

The twentieth century may be called as the century of the development of metric studies (Sangam, 2015). Scientometrics is an application of quantitative methods to the history of Science. It is also one of the techniques for documenting, collecting works of eminent scientists and researcher's. A scientometric study deals with the quantitative (where they are published) documentation of the communication of science by a given scientist. Scientific publications seem to have provided the best available basis for measuring the outputs of individual scientists as there is a good correlation between the eminence of scientists and their sustained scholarly publications (Hertzels and Price, 1987).

Scientometric studies are highly valued by historians of science, biographers of scientists, administrators of scientific establishments, science policy makers, R & D managers, educationalists, scientometricians, young scientists, documentalists, information scientists and science journalists (Stockley, 1957).

Bio-bibliometrics deals with the biographical study of the individual careers of scientists and researchers and correlating bibliographic analysis of publications or academic and scientific achievements. Individuals are the source of ideas. The institutions are built by the individuals and grow around individuals. Individuals are the basic foundations of any institution. By studying the individuals who have reached the top positions in academic and research life and by highlighting their works may stimulate the younger generation to emulate them. 'Bio-bibliometrics' is a term that was first coined by Sen and Gan (1990) to mean as the quantitative and analytical method for discovering and establishing functional relationships between bio-data and biblio-data elements. There are many bio-bibliometric studies, but they have hardly used the term 'biobibliometrics' in the titles of the papers except for Sen and Gan (1990) and Tiew (1999).

Kalyane and Kalyane (1993) first used the phrase 'Scientometric Portrait' to carry out bio-bibliometric studies on scientists. In some of the papers Kalyane and Devarai (1994) and Kalyane and Samanta (1995), used the term 'Informetrics' in the titles of their papers on C. S. Vekata Ram and K. Ramiah respectively. However, there was a continuous use of the phrase 'Scientometric Portrait' (Kalyane and Kalyane, 1993; Kalyane and Kalyane, 1994; Kademani and Kalyane, 1994; Kademani and Kalyane, 1994; Kalyane, 1995; Kalyane and Kademani, 1995; Kalyane and Munnolli, 1995; Kalyane and Sen, 1996; Kademani, Kalyane and Kademani, 1996; Kademani and Kalyane, 1996; Kalyane and Kademani, 1997; Kalyane and Sen, 1998; Kademani and Kalyane, 1998; Kademani, Kalyane and Jange, 1999; Kademani, Kalyane and Kumar, 2000; Kademani, Kalyane and Vijai Kumar, 2001; Kalyane, Prakasan and Kumar, 2001; Kalyane, Prakasan and Vijai Kumar, 2002; , Kalyane and Vijai Kumar, 2002; , Kalyane and Vijai Kumar, 2002; Munnolli and Kalyane, 2003; Koganuramath, et al., 2004; Angadi et al., 2004; Kademani et al., 2005) consistently. Mallinath Kumbar and Harinarayana N. S. have been studied on individual author with 360 papers, 2012. Sangam et. al., used both the terms scientometric portraits and bibliometrics (2006a, 2006b, 2006c, 2007).

The present study is attempted to draw a productivity, collaboration and authorship status of Jean Tirole, a French Professor of Economics.

## **2. BIOGRAPHICAL SKETCH**

Jean Tirole born on 9<sup>th</sup> August 1953 and raised in Troyes, a town located east of Paris and north of Burgundy. Troyes was the capital of Champagne in the middle ages; its fairs hosted trade between Northern Italian charities and Flanders among others; Troyes has accordingly preserved a rich cultural heritage. His father, who passed away in 1992, was an obstetrician/gynecologist; and mother in Troyes, taught French, Latin and Greek in high school. In high school, he was particularly interested in mathematics and social sciences (history and psychology in particular). He kept a strong interest in sciences at the Ecole Polytechnique, especially in mathematics with professors such as Laurent Schwartz, a Field medalist for his theory of distributions. Economics was not an obvious choice of study given his family background and the rather weak economic culture in France. As a matter of fact, he was rather unknowledgeable about the topic. He attended his first course in economics at Ecole Polytechnique at the age of 21, and he was fascinated by the issues and liked how it combines rigorous analysis and social sciences.

### 3. SCOPE OF THE STUDY

Scientometric portrait study is a quantitative analysis of the publications of an author or a scientist, either living or dead. It concludes all publications brought out during one's life time. In the present study are confined 227 contributions of Jean Tirole published in various national and international journals, conference proceedings, etc; during 1981-2016.

### 4. OBJECTIVES OF THE STUDY

The main objectives of the study are;

- ✧ To determine the position of Jean Tirole as main author and as co-author;
- ✧ To find out the year-wise distribution of authorship pattern;
- ✧ To find out authorship pattern;
- ✧ To observe publication pattern according to age.

### 5. METHODOLOGY

Publications count and analysis is one of the bibliometric/scientometric analytic techniques. It involves studying the number of publications in a single author, or productivity of literature in the field, with the aim of comparing "the amount of research in different countries, the amount produced during different periods, or the amount produced in different subdivisions of the field" (Hertzfel, 1987). Using the same technique, the study reported here analysed the single author study about Jean Tirole. Scientific publications seem to provide the best available basis for measuring the research output.

Data for this study has been obtained from Home page of TSE (Toulouse School of Economics) and Google Database to extract relevant data on Jean Tirole for the thirty-six years (1981-2016) and 271 records were retrieved. Thus a total of 271 records of different type viz. articles (227), Books (14), Proceedings papers (24), Editorial material (5) and Review (1), were retrieved. The collected data were transferred into Microsoft Excel 2007, and subjected to further analysis to meet the objectives and using some scientometric indicators and percentage analysis.

### 6. DATA RESULTS AND DISCUSSION

#### 6.1 Productivity

The literature of any subject reflects not only basic publishing pattern but also the characteristics of the author themselves. The author influence on the document is significant and very essential factor for scientometric research. Authorship pattern can be deciphered in areas like author productivity, collaborative or multiple authors and also the author choice in the form of publications. Jean Tirole has published 227 papers during 1981-2016. He has to his credit 58 single-authored, 136-double-authored, 26-three authored, 05 four-authored, 01 five-authored, 01 more than six-authored has one publication each respectively. He is the main author in 58 papers and co-author in 169 papers. Table 1 show that there are 442 co-authors in Jean Tirole papers. Two and three authored papers constitute nearly 62% of the total authorship while single author papers shares nearly 30% of the total authorship.

His 52 percentile productivity life is 10 years i.e., the 38th year of his life. Table 1 also depicts that the quinquennial trend in Tirole single-authored and multi-authored papers and cumulative number of total papers.

**Table 1: Distribution of papers of Jean Tirole by number of authors**

No. of authors	No. of papers	% of papers	No. of authors	% of authors
One	58	25.55	58	44.35
Two	136	59.92	196	30.77
Three	26	11.45	76	17.20
Four	05	2.20	20	4.52
Five	01	0.44	05	1.13
More than Six	01	0.44	09	2.03
Total	227	100	442	100

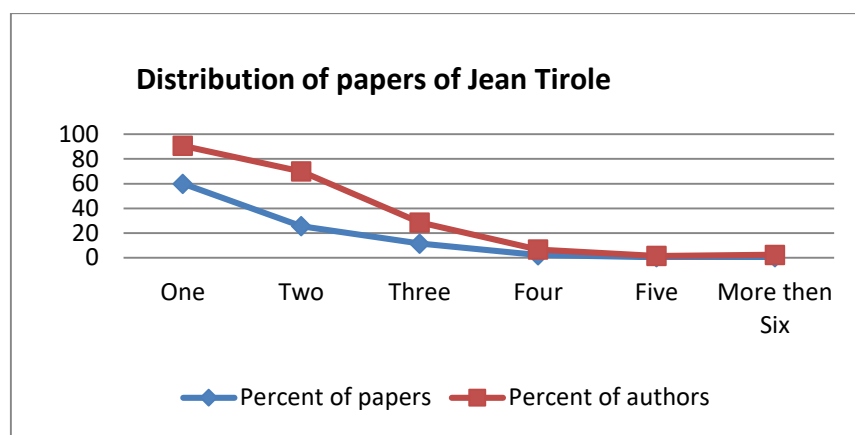


Fig. 1 Distribution of papers of Jean Tirole by number of authors

**Table 2: Year and age-wise distributions of papers by Jean Tirole**

Quinquennium	Pub. Year	1 Aut	2 Aut	3 Aut	4 Aut	5 Aut	More than 6	Main author	Co author	Total	Age of MT	Productivity (age)
Q1	1981	1	1	-	-	-	-	1	1	2	29	1
	1982	1	-	-	-	-	-	1	0	1	30	2
	1983	1	3	-	1	-	-	1	4	5	31	3
	1984	-	2	-	-	-	-	-	2	2	32	4
Q2	1985	1	2	2	-	-	-	1	4	5	33	5
	1986	2	6	-	-	-	-	2	6	8	34	6
	1987	-	6	1	-	-	-	-	7	7	35	7
	1988	2	5	-	1	-	-	2	6	8	36	8
Q3	1989	-	2	1	-	-	-	-	3	3	37	9
	1990	2	8	1	-	-	-	2	9	11	38	10
	1991	1	6	1	-	-	-	1	7	8	39	11
	1992	2	3	-	-	-	-	2	3	5	40	12
Q4	1993	-	3	-	-	-	-	-	3	3	41	13
	1994	3	5	-	-	-	-	3	5	8	42	14
	1995	1	4	-	-	-	-	1	4	5	43	15
	1996	1	8	-	-	-	-	1	8	9	44	16

Q5	1997	-	4	1	-	-	-	-	5	5	45	17
	1998	-	3	2	-	-	-	-	5	5	46	18
	1999	3	4	2	-	-	-	3	6	9	47	19
	2000	2	6	3	-	-	-	2	9	11	48	20
Q6	2001	1	4	-	1	-	-	1	5	6	49	21
	2002	2	5	-	-	-	-	2	5	7	50	22
	2003	2	5	1	1	-	-	2	7	9	51	23
	2004	2	6	2	-	-	-	2	8	10	52	24
Q7	2005	2	4	2	-	-	-	2	6	8	53	25
	2006	-	6	2	-	-	-	-	8	8	54	26
	2007	1	5	2	-	1-	-	1	8	9	55	27
	2008	2	4	-	-	-	-	2	4	6	56	28
Q8	2009	3	2	-	-	-	-	3	2	5	57	29
	2010	4	1	-	-	-	-	4	1	5	58	30
	2011	4	3	-	-	-	-	4	3	7	59	31
	2012	5	4	-	-	-	-	5	4	9	60	32
Q9	2013	1	-	2	-	-	1 (9)	1	3	4	61	33
	2014	1	1	1	1	-	-	1	3	4	62	34
	2015	4	4	-	-	-	-	4	4	8	63	35
	2016	1	1	-	-	-	-	1	1	2	64	36
	Total	58	136	26	05	01	01	58	169	227		
	%	25.55	59.91	11.45	2.20	0.44	0.44					

Chronological distribution of the papers along with collaborative pattern is presented in Table 2. Quinquennial distribution of his papers along with his productivity age depict that he had 10 papers during the first quinquennial. This was preceded by 28 papers in the next four years (1985-1988) and was followed 27 papers in the 3rd quinquennial period. Out of 227 papers, 169 belong to multi-authored papers, i.e., 74.45%. Single authored papers out of total 58 belong to the sixth quinquennial viz., 2001-2016 at the age of 49-64.

## 6.2 Authorship Pattern

Authorship studies provide valuable information concerning characteristics of authors, their collaboration, assessing and monitoring research activities among others (Kwadzo and Grace, 2008). Collaboration among scientists implies that they are working together and pursuing a common scientific goal (Kundra, 1996). Authorship pattern represents the number of authors per paper. When a researcher starts publishing papers in the beginning of his research career, generally the papers is published in collaboration with his research guide or senior colleagues. Hence, the initial papers of the scientist are in many cases co-authored with his guide. As the scientist becomes mature and rises in position, he would start to write papers on his own.

**Table 3: Authorship pattern**

No. of authors	1	2	3	4	5	>6	Total
No. of non-collaborative papers	58	-	-	-	-	-	58
No. of collaborative papers	-	136	26	05	01	01	169

As shows Table 3 it appears that the author has contributed only 58 papers without any collaboration during the entire span of his productive carrier. All the other papers (169) are the result of collaboration.

**Table 4: Time span of authorship pattern**

No. of authors	1	2	3	4	5	>6	Total
No. of papers	58	136	26	05	01	01	227
Time span	1981-2016	1981-2016	1985-2014	1983-2014	1981-2007	1981-2013	
Time span in years	36	36	30	32	27	33	

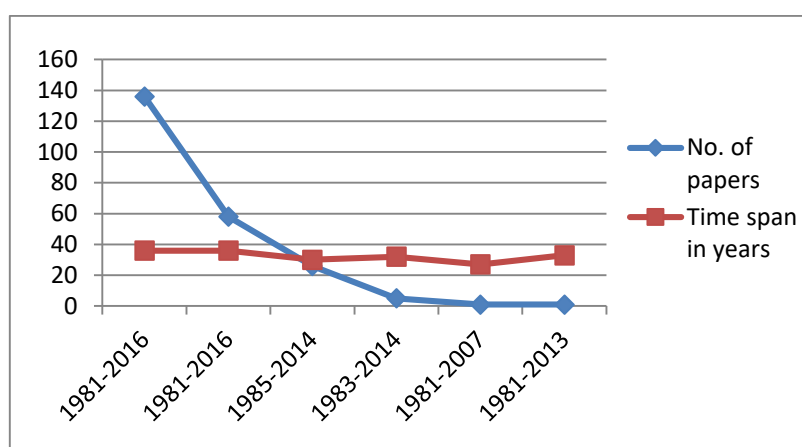


Fig. 2 Time span of authorship pattern

Table 4 represents authorship pattern with the time span of collaboration. Two-author collaboration has resulted in the largest number of papers, i.e. 136, naturally with the maximum time span of 36 years. Three-author papers totaling 26 was published in a time span of 30 years.

## 7. CONCLUSION

The study of Scientometric portrait of Nobel Laureate Jean Tirole, explored productive analysis of his publications as reflected in home page of Toulouse School of economics and Google Database. Publications of a successful scientist can be analysed biobibliometrically and it can evaluated basic themes of scientometrics of the writing career of scientist; such as productivity according to his biological age, collaborative pattern, authorship status rise and fall in the productivity curve, channel-wise scattering of publications and other characteristics. Individual research is decreasing day by day, the present situation compels on the researchers to go for collaboration in research, thus resulting in the shift from solo research to team research. Communication and collaboration between researchers are of great importance in the development of subject areas and in the dissemination of research results. Such studies will give a comprehensive analysis of the publication productivity of Nobel Laureate Jean Tirole; analysis part of the present paper explores that there is an increasing collaborative trend in Jean Tirole's publications.

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