

## DALE T. MORTENSEN'S CONTRIBUTION TO ECONOMICS: A SCIENTOMETRIC PORTRAIT

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**Abstract :** - *The primary focus of this paper is to analyze the major contribution of Dale T. Mortensen in the shape of scientometric analysis for his scholarly publications. Prof. Dale T. Mortensen got Nobel Prize in Economics when he was 71 years old in the year 2010. During his 48 years of publishing career, he published 56 papers. This study analyzes the keyword of the titles, various scientometric indicators, and language-wise distributions to examine the year-by-year growth pattern of publications, authorship pattern, collaborative authors and degrees of collaborations, language-wise distributions, core journals, highly cited papers, and the diversity of research activities. According to this study, the highest number of papers were contributed in 2005, when the author was 60 years old biologically. He has contributed an average of 1 to 2 publications per year. The value of the productivity coefficient was 0.63. The value of Publication Density was 1.90, and the value of publication concentration was 0.28. His publication received a total of 4,497 citations.*

**Keywords:** Nobel Laureates, Esther Duflo, Economics, Scientometric Portraits, Scientometric indicators.

### 1. Introduction

The Nobel Prize is regarded as the most prestigious and honorific recognition of scientific achievement. It is awarded to individuals or groups who have made significant contributions to their respective fields, and winning the Nobel Prize can significantly enhance the standing and reputation of both the individual and the institution to which they belong (Kalyane et al., 2002)

The Nobel Prize can only be granted to live scientists, and only up to three people can win in each category: chemistry, physics, physiology or medicine, literature, economics, and work for global peace. The Nobel Prize is meant to encourage young people to work in research and technology. All efforts are made to show a Nobel laureate as a hero of a specific field of specialization who has spent his life uncovering truths that can be checked (Upadhye, 2004).

A scientometric portrait is a comprehensive analysis of an individual's research work, typically presented in the form of a scientific article or report. Its main objective is to assess the person's scholarly impact, productivity, and influence within their area of study using quantitative measures. From 1969 to 2021, "*The Sveriges Riksbank in Economics Sciences of Alfred Nobel*" has been awarded 53 times to 89 laureates. The 66<sup>th</sup> Nobel Laureates, Prof. Dale T. Mortensen, got his prize in 2010. Mortensen studied labor economics, macroeconomics, and economic theory. He is best recognized for developing the search and matching theory of frictional unemployment.

## **2. Biographical Sketch of Dale T. Mortensen**

American economist Dale T. Mortensen was born in Enterprise, Oregon, on February 2, 1939. He was born and raised in a farming hamlet in a rural area. Mortensen attended Willamette University in Salem, Oregon for his undergraduate studies in economics before attending Carnegie Mellon University for his master's and PhD studies in the subject.

After finishing his education, Mortensen started working as an academic at Northwestern University in 1965, where he remained employed until his passing. He held the positions of director of the Center for Labor Economics, chair of the department of economics, and economics professor.

The creation of the search theory of unemployment and his contributions to labor economics are what make Mortensen most famous. Mortensen shared the 2010 Nobel Memorial Prize in Economic Sciences with Christopher Pissarides and Peter Diamond for their work on the search and matching theory of the labor market. Their work contributed to the understanding of why certain employees experience prolonged unemployment and why unemployment can endure even during periods of economic development.

Mortensen published numerous books and articles on labor economics throughout his career, such as "Job Search, the Duration of Unemployment, and the Phillips Curve" (1970), "The Matching Process as a Noncooperative Bargaining Game" (1982), and "Wage Dispersion: Why Are Similar Workers Paid Differently?" (1994). His work has significantly influenced the field of labor economics and has received several citations from other academics.

Mortensen was a Fellow of both the Society of Labor Economists and the Econometric Society. He was renowned for his research as well as for his commitment to teaching and serving as a mentor to many upcoming economists.

At the age of 74, Dale T. Mortensen passed away on January 9, 2014. He is regarded as a smart economist who significantly improved knowledge of the labor market and the reasons for unemployment's persistence (Britannica, 2023).

### 3. Related Works:

Kuri and Ravi examined at a Scientometric analysis on Dr. Ramesh Babu's publications in 2014. LIS expert Dr. Ramesh Babu is well-known in the field. They made an effort to analyze his 236 works in the field of library and information science from 1986 to 2010 using a variety of bibliometric indicators. They used a variety of sources to retrieve the bibliographic information. With the help of the DDC, they were able to divide his research into eight different areas, with LIS Education, Library Classification, ICT, and other fields producing the highest results. 2010 had the most publications (34), followed by 2008 (28), and 2006 (27). Gopalkrishnan S. was a top collaborator with Dr. Ramesh Babu, contributing to a total of 22 publications. He published 53 journal papers between 1969 and 2010 on 41 national and 12 international channels, with the top journals including Information Age, Library Herald, Library Review, and DESIDOC Bulletin of Information Technology. Dr. Babu has collaborated with 122 eminent LIS scholars during the course of his career, demonstrating his support for team-based research (Kuri & Ravi 2014).

Dr. Atta-ur-Rahaman, a distinguished organic chemistry researcher from Pakistan, a scientometric portrait done in 2011 by Anjum and Ahmad. They made an effort to examine his 766 articles from 1966 to 2007 in terms of the following: year, author, domain, used

communication media, keyword occurrence in titles, productivity origin country. According to the study's findings, he contributed the most papers in 2005 and had no publications in 1970, the only year in his forty-two-year research career. The eighth quinquennium marked his highest period of publication. The overall number of authors that collaborated on research projects with Rahaman was 3214, while the total number of authors was 3279 (Anjum & Ahmad, 2011).

L. L. Narayana was a notable botanist from India who published 175 article between 1955 and 1990. In 2003, Kalyane conducted a Scientometric study on his work. He evaluated his creative output in terms of publications productivity, authorship patterns, author productivity by domain, communication methods, and title keywords. Out of his total publications, 26 were single-authored papers and the remaining 149 were multi-authored, according to the study's results. One interesting finding is that he published all of his papers collaboratively for up to 46 years. His research was mostly focused on chemotaxonomy, floral anatomy, embryology, and systematic position, with 57, 53, 37, and 15 papers per area, respectively. The productivity coefficient was 0.45, the publishing rate was 4, and the fifty-percentile age was 27. The most prominent Narayana collaborator, as stated by Kalyane, was M. Radhakrishnan, who was followed by D. Rao, G. Nageswar, K. T. Sundari, S. M. J. Anuradha, and so on. He discovered an association between author productivity and

research interests of 0.57. For the L. L. Narayan research group, the 80/20 rule is applicable. Current Science, Journal of Japanese Botany, Journal of Botanical Society, and Proceedings of Indian Academy of Science were his three favorite journals. Publication Concentration, Average Bradford Multiplier, and Publication Density all had values of 5.5, 12.5, and 5.1, respectively (Kalyane, 2004)

In 1998, Kalyane and Kademani formed a Scientometric portrait of R. Chidambaram, an Indian nuclear physicist who published 164 scientific papers between 1958 and 1993. Using the Science Citation Index, his article's citations from 1958 to 1992 were examined. The analysis is done by year-wise, collaboration style, subject area, and communication channels. According to the study's findings, the year 1972 had the most citations. His single-authored papers had 132 citations according to the authorship analysis studies, which clearly demonstrate how highly cited his multi-authored papers are (Kalyane & Kademan 1998).

Another Scientometric profile of K. S. Krishnan was carried out by Kademani et al. in 1996. There were 31 single-authored papers among the 135 publications that Indian physicist K. S. Krishnan published between 1925 and 1965. 1937–1938, 1944–1945, 1951–1953, 1955, and 1961 were the years with the highest collaboration coefficient, according to the study. It was 0.32 for his productivity coefficient. Publication density – 6.43, publications Concentration – 7.69, and

Average Bradford multiplier – 4.34. Spectroscopy and magnetism were his most interesting area of research (Kademani et. al. 1996).

#### 4. Methodology:

Research publications of Prof. Dale T. Mortensen from 1970 to 2017 were retrieved from the Scopus database by entering the author search term in the database with checking the author's affiliation. The citation information and bibliographic data were saved in a CSV file, which was then loaded into MS Excel. Institutional biographic data, which contains the publication details of Prof. Dale T. Mortensen, were used to verify the bibliographic data, which were retrieved from the Scopus database. The Wordle software is used to visually display the keywords present in the titles (Bhui & Bhattacharyya, 2017).

Applying the above methodology, the specific objectives are set as follows

- In order to comprehend the trend in research productivity growth.
- Looking into how authorship is allocated.
- To determine the level of collaboration.
- To find the most productive collaborators.
- The publications that have been cited the most
- Find the most frequently used keywords in the titles.

## 5. Growth pattern of Research productivity of Prof. Dale T. Mortensen:

### 5.1.1. Year and age-wise distribution of research output by Prof. Dale T. Mortensen:

Table-1 show the publication productivity of Dale T. Mortensen. He has published 56 papers from 1970 to 2017. On average, there are 1.16 papers produced annually. It indicates that his documents were still being published for several years following his death in 2014. His first publication appeared in 1970 when he was 31 years old. During his long period of publications life, no publication appears in 15 years. According to Figure 1, the most productive year was 2005, with a value of 6. The second-highest year was 1998, with a value of 5. During the years 2005 to 2012, productivity was at its highest, with an average of 2.25 articles per year. Based on the productivity coefficient calculation of 30/48, which equals 0.63, it appears that there has been an improvement in productivity after reaching the fifty-percentile age.

### 5.1.2. Quinquennium-wise productivity for Prof. Dale T. Mortensen:

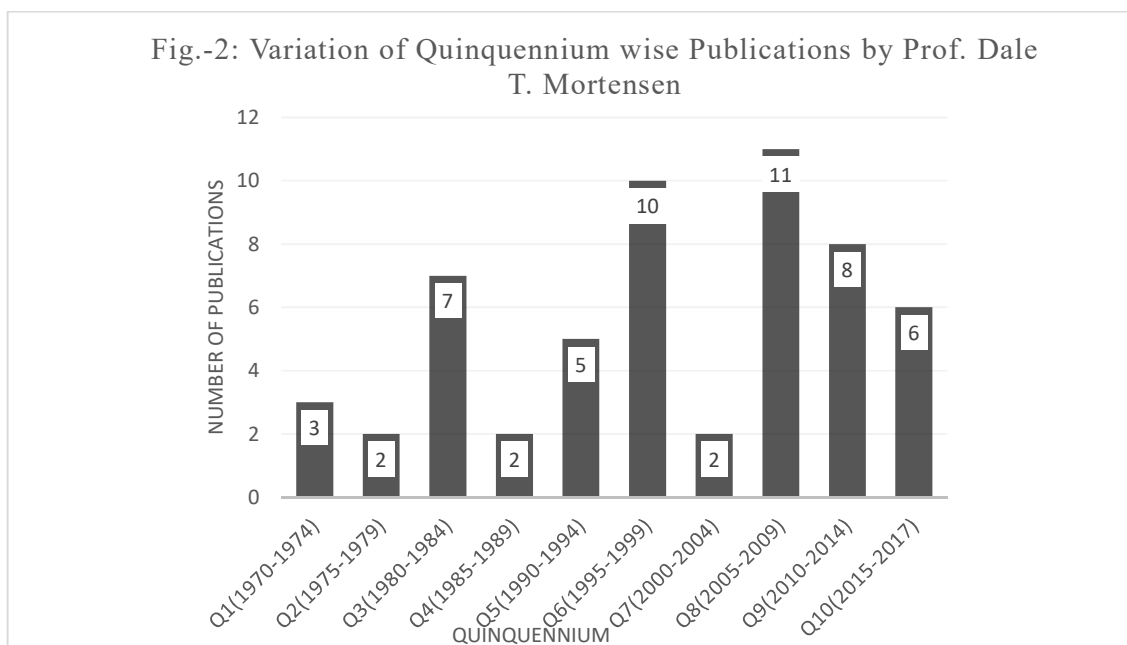
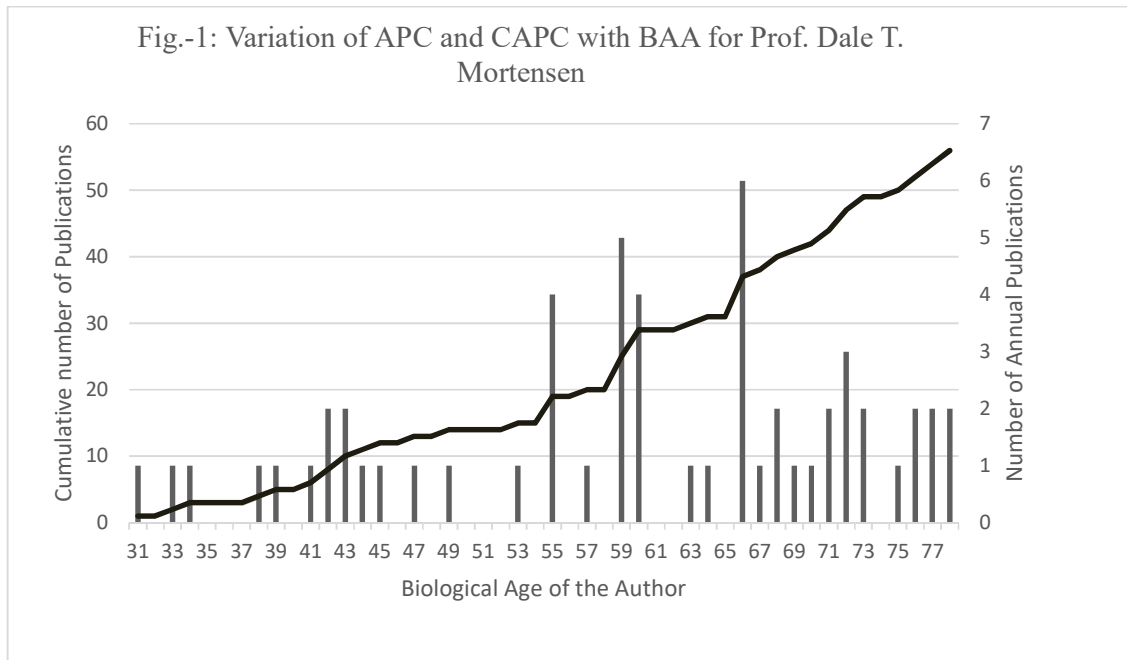
The data displayed in Table-1 and Fig.-2 presents Professor Dale T. Mortensen's publications over five-year intervals. The 8th quinquennium (2005-2009) had the most publications, with a total of 11. The 6<sup>th</sup> quinquennium had 10 publications, and the 9<sup>th</sup> quinquennium had 8 publications.

Table-1 Year and Age-wise distribution of Publication and Collaboration Rate

Quin.	BAA	PY	No. of Papers under various Authors		Main Author	Co-author	APC	CAPC	%CAPC	PPA	Total no. of Authors	DC	CI	CC
			Single	MAP										
Q1	31	1970	1		1		1	1	1.79	1	1	1.00	1	0.00
	32	1971					1	1.79	2	0				
	33	1972	1		1		1	2	3.57	3	1	1.00	1	0.00
	34	1973	1		1		1	3	5.36	4	1	1.00	1	0.00
	35	1974						3	5.36	5	0			
Q2	36	1975						3	5.36	6	0			
	37	1976						3	5.36	7	0			
	38	1977	1		1		1	4	7.14	8	1	1.00	1	0.00
	39	1978	1		1		1	5	8.93	9	1	1.00	1	0.00
	40	1979						5	8.93	10	0			
Q3	41	1980		1		1	1	6	10.71	11	2	0.00	2	0.50
	42	1981	1	1	1	1	2	8	14.29	12	3	0.50	1.5	0.25
	43	1982	2		2		2	10	17.86	13	2	1.00	1	0.00
	44	1983	1		1		1	11	19.64	14	1	1.00	1	0.00
	45	1984		1		1	1	12	21.43	15	4	0.00	4	0.75
Q4	46	1985						12	21.43	16	0			
	47	1986	1		1		1	13	23.21	17	1	1.00	1	0.00
	48	1987						13	23.21	18	0			
	49	1988	1		1		1	14	25.00	19	1	1.00	1	0.00

	50	1989						14	25.00	20	0			
Q5	51	1990						14	25.00	21	0			
	52	1991						14	25.00	22	0			
	53	1992	1		1		1	15	26.79	23	1	1.00	1	0.00
	54	1993						15	26.79	24	0			
	55	1994	2	2	4		4	19	33.93	25	6	1.00	1.5	0.25
	56	1995						19	33.93	26	0			
Q6	57	1996	1		1		1	20	35.71	27	1	1.00	1	0.00
	58	1997						20	35.71	28	0			
	59	1998		5	1	4	5	25	44.64	29	15	0.20	3	0.63
	60	1999	1	3	4		4	29	51.79	30	7	1.00	1.75	0.38
Q7	61	2000						29	51.79	31	0			
	62	2001						29	51.79	32	0			
	63	2002		1	1		1	30	53.57	33	2	1.00	2.00	0.50
	64	2003		1	1		1	31	55.36	34	2	1.00	2	0.50
	65	2004						31	55.36	35	0			
Q8	66	2005	3	3	4	2	6	37	66.07	36	12	0.67	2	0.30
	67	2006		1		1	1	38	67.86	37	2	0.00	2.00	0.50
	68	2007		2	2		2	40	71.43	38	4	1.00	2	0.50
	69	2008		1		1	1	41	73.21	39	2	0.00	2	0.50
	70	2009	1		1		1	42	75.00	40	1	1.00	1	0.00
Q9	71	2010	1	1	1	1	2	44	78.57	41	3	0.50	1.5	0.25
	72	2011	1	2	2	1	3	47	83.93	42	6	0.67	2	0.39
	73	2012		2		2	2	49	87.50	43	4	0.00	2	0.50
	74	2013						49	87.50	44	0			
	75	2014	1		1		1	50	89.29	45	1	1.00	1	0.00
Q10	76	2015	1	1	1	1	2	52	92.86	46	3	0.50	1.5	0.25
	77	2016		2		2	2	54	96.43	47	4	0.00	2	0.50
	78	2017		2		2	2	56	100.00	48	18	0.00	9	0.84
<b>Total</b>			<b>24</b>	<b>32</b>	<b>36</b>	<b>20</b>	<b>56</b>				<b>113</b>			

BA: Biological Age of the Author, PY: Year of Publications, APC: Annual Publication Count, MAP: Multi Authored Publications, PPA: Publication Productivity Age, DC: Degree of Collaboration, CI: Collaborative Index, CC: Collaboration Co-efficient, Qui.: Quinquennium, CAPC: Cumulative no. of Annual Publication Count.



### 5.1.3. Item type distribution of publications of Prof. Dale T. Mortensen:

Table-2 displays Prof. Dale T. Mortensen's publication distribution by item category. Out of his 56 publications, journal articles identify 40, followed by Review 5, Book chapter 4, Book 3, Conference paper 1 and other types 3. He expressed an interest in having the scholarly work that he had done published in the journal article.

Table-2 Distribution of publications by item type

Sl. No.	Types of Documents	No. of Publications	Percentage
1	Article	40	71.43
2	Review	5	8.93
3	Book Chapter	4	7.14
4	Book	3	5.36
5	Conference paper	1	1.79
6	Others	3	5.36
	<b>Total</b>	<b>56</b>	<b>100.00</b>

## 5.2. Authorship pattern and Degree of Collaboration for Prof. Dale T. Mortensen

Tables 1 and 3 display the authorship distribution and level of collaboration for Prof. Dale T. Mortensen. Out of his 56 publications, he has published 24 single-authored papers and 32 papers with multiple authors, of which he has been the primary author in 36. Publications with many authors include those with two authors (counted as 24), three authors (counted as 2), four authors (counted as 4), five authors (counted as 1), and fourteen authors (counted as 1).

From Table-1, DC = 1 for eleven years, where only multi-authored papers appear in these years. DC = 0 for thirteen years. where only single-authored papers appear in these years. DC = 0.50 for five years.  $0 < DC < 0.50$  not in any years.  $0.50 < DC < 1$  for two years (1999 & 2011), where the number of multi-authored papers is higher than single-authored papers.

Table-3 Distribution of Publications by number of authors

No. of Authored	No. of Papers	% of Papers	Total no. of Authors	% of Authors
Single	24	42.86	24	21.24
Two	24	42.86	48	42.48
Three	2	3.57	6	5.31
Four	4	7.14	16	14.16
Five	1	1.79	5	4.42
Fourteen	1	1.79	14	12.39
<b>Total</b>	<b>56</b>	<b>100.00</b>	<b>113</b>	<b>100.00</b>



Table-4 Prominent Collaborators

Rank	Co-Author's name	No. of Papers contributed with Dale T. Mortensen	FPY	LPY	Total contributed years
1	Pissarides C.A.	9	1994	2011	18
2	Burdett K.	6	1980	2012	33
3	Lentz R.	5	2005	2016	12
4	Seven authors	2 papers each			
5	Twenty-three authors	1 paper each			

### 5.2.1 Prominent collaborators with Prof. Dale T. Mortensen

Thirty-four distinct authors have worked with Prof. Dale T. Mortensen, who has 113 authorships overall. The most notable authors who worked with him are shown in Table 4. Christopher A. Pissarides, a Cypriot economist who won the Nobel Memorial Prize in economic sciences in 2010, is the most notable contributor. Between 1994 and 2011, he worked on 9 different publications. Rasmus Lentz, 5, and Kenneth Burdett, 6, are two additional active collaborators.

Table-5 Channels of communication preferred by Prof. Dale T. Mortensen

Sl. No.	Journal Name	Published by	FPY	LPY	No. of Articles
1	Review of Economic Dynamics	Elsevier	1984	2016	5
2	International Economic Review	Chinese Corporation for Promotion of Humanities	1998	2005	4
3	American Economic Review	American Economic Association	1970	2011	4
4	Carnegie-Rochester Confer. Series on Public Policy	Elsevier	1981	1996	3
5	Econometrica	Blackwell Publishing	1973	2016	3
6	Journal of Economic Dynamics and Control	Elsevier	1994	2009	3
7	Journal of Labor Economics	University of Chicago Press	1988	2005	3
8	Applied Economics	Routledge	1998	1998	2
9	Numbers of channels having one paper each				13

### 5.3. Channel of communication used by Prof. Dale T. Mortensen

Prof. Dale T. Mortensen used 21 channels to publish his 40 articles. Table-5 depicts the preferred channels of communication by Dale T.

Mortensen. In *Review of Economic Dynamics* (published by 'Elsevier'), the highest number of works has been published i.e., 5 in number. The value of Publication Density =  $40/21 = 1.90$ , and the value of Publication Concentration



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