

Professor Czesław Domański – 55 years devoted to statistics

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In 2023, Professor Czesław Domański celebrates his 80th birthday and the 55th anniversary of his professional career as an academic teacher. These years have been marked by numerous achievements in the field of science, education and organisation, making Professor Czesław Domański widely recognised among the academic and official statistics community. The aim of this article is to present the Professor's accomplishments in the context of his memories, shedding light on the inspirations that helped him achieve success and led to reflections on the role of statistics in the modern world.

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Professor Czesław Domański was born on 11 April 1943 in the town of Dąbrówka in the Kutno district, which was annexed to Nazi Germany during the occupation. After graduating from the Pedagogical High School in Radomsko and later the Ewaryst Estkowski Teacher Training School in Łódź, he began his mathematical studies in 1963 at the Faculty of Mathematics, Physics and Chemistry of the University of Lodz. He completed his studies in 1968, earning a master's degree in mathematics for his work in the field of cybernetics and information theory entitled *Non-Comma Dictionaries* (Pol. Słowniki bezprzecinkowe), supervised by Jerzy Jaroń, PhD, DSc.

Professor Czesław Domański's life and 55-year professional career have been consistently linked to the University of Lodz. Significant stages in its development included holding the following positions:

- Vice-Director of the Institute of Econometrics and Statistics at the University of Lodz (1976–1984);
- Vice-Dean of the Faculty of Economics and Sociology at the University of Lodz (1987–1990);
- Head of the Statistical Methods Unit at the Institute of Econometrics and Statistics at the University of Lodz (1987–1991);
- Dean of the Faculty of Economics and Sociology at the University of Lodz (1990–1993);
- Head of the Department of Statistical Methods (1992–2017);
- Vice-Rector for Economic Affairs and Promotion at the University of Lodz (1993–1996);
- Director of the Institute of Econometrics and Statistics at the University of Lodz (1997–2008);
- Director of the Institute of Statistics and Demography (2009–2016).

The beginning of the Professor's academic career dates back to 1968, when he started working as an academic teacher at the University of Lodz, initially as a teaching assistant and later as an assistant professor in the Department of Demography and Statistics at the Institute of Econometrics and Statistics. This moment turned out to be pivotal in his life, as it marked the beginning of a 55-year career dedicated to the study, teaching and popularisation of statistics.

Professor Czesław Domański had encountered statistics during his university studies, but the subject didn't raise much of his interest at the time, perhaps because it was not offered as a separate subject but was only a part of Dr Tadeusz Gerstenkorn's lecture on 'Probability Calculus' (Pol. Rachunek prawdopodobieństwa), temporarily taught by Dr Ryszard Jajte. Thus, his first significant encounter with statistics was when he began working at the Department of Demography and Statistics at the University of Lodz:

My first encounter with statistics took place on 28 September 1968 at the Department of Demography and Statistics at the University of Lodz. Professor Edward Rosset offered me the position of a teaching assistant at the Department and informed me that I would be teaching 'Mathematical Statistics' to third-year Econometrics students, starting the following week. For any current teaching matters, I was to report to Dr Zbigniew Michałkiewicz; at that time, econometrics was a prestigious field of study, not only within the department but also university-wide and across Poland. The students were then highly proficient in mathematics.¹

Professor Domański recalls his first teaching experience as follows:

I reported to Dr Zbigniew Michałkiewicz, who worked in room no. 6 alongside young master's graduates: Janusz Murlewski, Stanisław Bartczak, and Włodzimierz Obraniak. The future head of the Department of Demography and Statistics understood the information from Professor Rosset and informed me that, concerning the statistics classes, I should contact Jolanta Martini, MSc, a mathematician, who was also conducting the same 'Mathematical Statistics' practicals in the other group. The next day, I went to the University's HR department to navigate through a lengthy and complex formal process. Previously, obtaining a position at the university was out of the question if a candidate had participated in the student strike of March 1968 (the Students' March of 1968 was a series of protests against the ruling Polish United Workers' Party of the Polish People's Republic). After two days, I gathered the necessary opinions that did not object to my employment. In the meantime, I met Jolanta Martini, MSc, who was pleased that she would have less work and lent me the book *Probability Theory and Mathematical Statistics* (Pol. Rachunek prawdopodobieństwa i statystyka matematyczna) by Marek Fiszczyk.

The Professor emphasised on several occasions that the cited work by Marek Fiszczyk marked the beginning of his journey to the understanding, acquisition and expansion of his knowledge in statistics, first in the sphere of teaching and then research: 'It was the second edition of this book from 1958, somewhat thinner than the third edition consisting of 694 pages, which is on the bookshelf of my library'.

In addition to Fiszczyk's book and other works in the field of mathematical statistics, lectures and practicals in the area of representative methods conducted by Dr Jerzy Greń played a significant role in his development as an educator. The Professor recalls:

In the winter semester of the 1969/70 academic year, the subject of representative methods was included in the curriculum for the econometrics programme, with Dr Jerzy Greń from the Main School of Planning and Statistics as the lecturer. I was a student in these very

¹ All statements come from a private interview given to employees of the Department of Statistical Methods of the University of Lodz.

engaging lectures and discussions during my time in the Department, and I conducted the practicals for this subject.

It should be mentioned here that the times in which Professor Czesław Domański began his scientific and teaching career remained challenging for statistics. In the years 1950–1956, statistics was considered a ‘dangerous’ science and was in different ways eliminated, restricted and adapted to meet the needs of the state authorities. As a consequence, especially in economic universities, there was a strong focus on teaching as a means of coping with these limitations. Such a strategy was employed in the Higher School of Economics in Łódź, which, for a certain period, even offered a statistics programme.

The first Polish Science Congress, held from 29 June to 2 July 1951 in Warsaw, where the Section of Economic Sciences and the Subsection of Statistics were established, ignored the existence of the Polish Statistical Association (PSA). In 1952, a Conference of Higher Schools of Economics was held, with representatives from the 15 statistics departments then existing in higher education institutions in Poland. During the conference, individual departments presented their research and work programmes.

Another conference was convened by the Department of Economic Studies of the Ministry of Higher Education, and its organisation was entrusted to the Department of Economic Statistics at the Main School of Planning and Statistics in Warsaw. The conference took place on 25–30 October 1958 in Zakopane. Representatives from 13 statistics departments and Statistics Poland participated in the event. Numerous topics related to research and organisational work were discussed, and among them the initiative to establish an Interuniversity Institute of Statistics affiliated to the Polish Academy of Sciences. The vast majority of statisticians present at this conference did not accept the idea of creating an Interuniversity Institute of Statistics, which entailed the centralisation of the planning of Polish statistics. Academic teachers skilfully overcame this impasse by introducing widespread econometrics while still teaching statistics with various ‘adjectives’. The ‘econometrisation’ process was accelerated by the establishment of the Econometrics School by Prof. Zbigniew Pawłowski, under the auspices of the then Ministry of Higher Education and Science.

Despite the many difficulties associated with work in higher education institutions during that period, a strong emphasis was placed on teaching, and the development of the ethos of an academic teacher played a particularly important role. Professor Czesław Domański often mentions these role models:

Superiors were very demanding and ensured that young adepts of teaching and science fully developed both intellectually and socially. They emphasised the pedagogical and educational role, as well as their influence on academic youth through a meticulous preparation for exercises, punctuality, appearance, erudition, and involvement in students' lives outside the university – as supervisors of student dormitories, as well as scientific, sports, and other clubs.

Teaching became a true passion for Professor Domański, which resulted in the preparation of a lecture and practicals programme for the subject of 'Survey sampling'. This was accompanied by the development of a script titled *A collection of exercises in survey sampling* (Pol. Zbiór zadań z metody reprezentacyjnej), of which he was the editor and co-author. However, the greatest popularity and student interest was garnered by the script first published by the University of Lodz Publishing House in 1979 under the title *A collection of statistics. Exercises* (Pol. Zbiór zadań ze statystyki). As it was modified and expanded in the subsequent editions (the latest, sixth edition in 2001 with a print run of 3,000 copies), this book, under the editorship of Czesław Domański, transformed into a statistics textbook titled *Statistical methods, theory, and exercises* (Pol. Metody statystyczne, teoria i zadania), which continues to be highly useful.

The earlier years of professor Domański's work at the Institute of Econometrics and Statistics (1970–1979), when he chaired the Institute's Committee for Didactics, resulted in the development of numerous beneficial teaching-related initiatives and actions. Thanks to his effort, collections of supplementary materials for current statistics classes were published. During his tenure as the Vice-Dean and later as the Dean of the Faculty, he initiated changes and alterations to the curriculum for all existing study programmes in line with the requirements and needs of the market economy.

Since 1997, Professor Czesław Domański has been the main organiser of the annual educational conference dedicated to 'Teaching methods for quantitative subjects'. A valuable achievement in this regard is the integration of the community of mathematicians, statisticians, economists and computer scientists – both academic teachers and representatives of the business world and various levels of local government, including the City of Łódź.

In his teaching, in addition to his professional expertise, Professor Domański emphasises the cultivation of patriotic and civic attitudes in the younger generations and the ethical aspect of acquiring and utilising knowledge gained during their studies. Therefore, he is both a teacher and a mentor.

Professor Domański's pedagogical work is closely connected with his popularisation activity. Its important aspect is the promotion of Polish statisticians

and their contribution to the development of statistical research, both nationally and internationally. The Professor has authored numerous biographies of prominent figures in this field who lived in the 19th and 20th century. These biographies were included in a publication issued by Statistics Poland: *Profiles of Polish Statisticians* (Pol. Sylwetki statystyków polskich), which was published in 1984 in Polish, English and Russian, and later in 1989 and 1990, as well as in the compilation *Polish Statisticians* (Pol. Statystycy polscy), edited by Prof. Mirosław Krzyśko on the 100th anniversary of the establishment of the PSA.

In addition to his pedagogical work, Professor Czesław Domański has been developing a wide-ranging and successful scientific activity almost from the beginning of his employment at the University of Lodz.

As a result of the enduring scientific achievements over the years, a Łódź centre, managed by Professor Czesław Domański has advanced to become a significant centre of statistical research, and he himself is considered among the national academic environment as one of the founders of the Łódź School of Nonparametric Statistics.

Within the common realm of scientific and pedagogical work, Professor Czesław Domański supervises and reviews doctoral dissertations and other academic works written to attain higher academic degrees. To date, Professor Czesław Domański has supervised 29 doctoral candidates, reviewed 154 doctoral and postdoctoral dissertations and proceedings for the appointment of the title of professor. What led to these accomplishments and provided inspiration for the Professor's scientific endeavours?

Initially, when Mr Czesław Domański started his academic career, he had to delve into the fundamentals of the areas of knowledge that were new to him, but from the beginning, he took this aspect of academic work very seriously.

In the first year of my work, I essentially continued my studies in the field of descriptive, economic and mathematical statistics, as well as in survey sampling. Simultaneously, having excellent mentors for each subject, such as Zbigniew Michałkiewicz, Władysław Welfe, Zofia Zarzycka, Tadeusz Miller and Jerzy Gren, I easily absorbed this new knowledge, and, above all, I became convinced of its immense utility in every domain of economic, social and natural life. The practical side of statistics became apparent to me most instantly in the field of medical sciences thanks to Tadeusz Miller, who introduced me to the medical environment as a statistics consultant, first for doctoral, then postdoctoral theses, as well as those needed to obtain the title of professor. Later, we conducted joint research in cooperation with the Medical Academy and the Military Medical Academy. I was associated with the latter institution for over 10 years as a lecturer in medical statistics for future medical officer students, which allowed me to gain insight into the research needs of this scientific community.

All of this led to a growing interest on the Professor's part in mathematical statistics and its applications in various fields. However, the pivotal event occurred in 1970.

A pivotal moment in my scientific career was my encounter with Professor Zdzisław Hellwig in Krosno Wielkopolskie, near Kępno, during my days at the aforementioned Econometrics School. Professor Hellwig presented several problems that were to be the subject of doctoral research. After selecting a topic and working on its development, I was admitted to his seminars following a few hours of presenting the chosen subject at the chalkboard. The professor stated that I could participate in his seminars and emphasised that I had chosen a good topic, i.e. the 'Application of the runs theory based on the number and length of runs'. He justified this by pointing out that it provided opportunities for research considering both its analytical and applied aspects, especially in the preferred at that time field of econometrics.

The doctoral seminars with Professor Hellwig with his scientific passion and presentation skills ignited a kind of enthusiasm in my process of learning new statistical methods and their versatile applications. Analytical problems within the scope of the runs theory were rather complex, because they dealt with the distribution of discrete variables concerning both the number and length of runs.

The new research area undertaken by Czesław Domański, MSc, covering various issues related to the construction of statistical tests based on the number or length of runs, was very well received by the scientific community. Czesław Domański obtained funding as part of Core Problem 06.0.1.06.2.04, led by the Institute of Mathematics of the Polish Academy of Sciences. The results were presented in two reports: 'On the convergence of test statistics for some tests based on the chi-square distribution' (Pol. O zbieżności sprawdzianów niektórych testów do rozkładu chi-kwadrat) and 'Tables of the unconditional distribution of the number of runs' (Pol. Tablice bezwarunkowego rozkładu liczby serii), presented before the committee chaired by Professor Jerzy Łoś. One example of these studies is the article 'A runs test based on the number of runs' (Pol. Test serii oparty na liczbie serii) (1973), published in the *Polish Statistical Review* journal.

The chosen topic of my doctoral dissertation allowed me to present it to Professor Jacob Wolfowitz during the 40th session of the International Statistical Institute in Warsaw thanks to a recommendation from Professor Zdzisław Hellwig. At this meeting, I learned the mechanism of constructing runs distribution tables, whose first constructor was Professor Jacob Wolfowitz.

Professor Domański's thus initiated scientific career continues to this day. He obtained his doctorate in 1976 for his thesis entitled *Econometric Applications of Runs Tests* (Pol. Ekonometryczne zastosowania testów serii) written under the supervision of Professor Zdzisław Hellwig. The basis for his postdoctoral degree obtained in 1986 was the work entitled *Theoretical foundations of nonparametric tests and their application in socioeconomic sciences*, published by the University of Lodz. The book *Statistical Tests* (Pol. Testy statystyczne) from 1990, along with the earlier scientific achievements of Czesław Domański, formed the basis for obtaining the title of professor, which took place in 1991.

Among the numerous book publications, the following monographs deserve special recognition: *Nonparametric statistical tests* (Pol. Statystyczne testy nieparametryczne) (PWE, 1979), *Statistical tests* (Pol. Testy statystyczne) (PWE, 1990), *Non-classical statistical methods* (Pol. Nieklasyczne metody statystyczne) (PWE, 2000), *Statistical expert systems* (Pol. Statystyczne systemy ekspertowe) (University of Lodz Publishing, 1998; co-authored by H. Gadecki, K. Pruska, A. Rossa), *Small area statistical methods* (Pol. Metody statystyki małych obszarów) (University of Lodz Publishing, 2000; co-authored by K. Pruska), *Statistical methods of multiple inference* (Pol. Statystyczne metody wnioskowania wielokrotnego) (University of Lodz Publishing, 2007; co-authored by D. Parys), *Non-classical methods of efficiency and risk assessment. Open pension funds* (Pol. Nieklasyczne metody oceny efektywności i ryzyka. Otwarte Fundusze Emerytalne) (PWE, 2011; co-authored by J. Białek, K. Bolonek-Lasoń, A. Mikulec).

A truly exceptional aspect of Professor Czesław Domański's activity lies in his involvement in the field of official statistics. He has belonged to a variety of national and international statistical societies, and it was his efforts that led to the reactivation of the PSA. Furthermore, he was involved in the organisational work of the Association: he served as its Vice President (1985–1990) and President during the successive terms of 1994–2000, 2000–2005, and 2010–2018, as well as member of the Main Council and as Honorary President of the PSA. The Professor's achievements in these roles resulted in the intensified integration of the academic and statistical community with Statistics Poland and statistical offices in various regions of Poland. Additionally, he played an active role in the publication of works related to the history of Polish statistics and contributed to the revival of the *Statistical Quarterly* (Pol. Kwartalnik Statystyczny) journal. Professor Domański's organisational achievements include the establishment of the Bureau of Statistical Research and Analysis within the structures of the PSA. The collaboration between the PSA and Statistics Poland was based on the consolidation of Professor Czesław Domański's activities with the authorities of Statistics Poland, particularly evident in the

interactions with Professor Jan Kordos. Professor Czesław Domański recalls the beginnings of this exceptional cooperation as follows:

My first scientific article was titled *Regional income distribution* (1970), which attracted the interest of Dr Jan Kordos. This article facilitated my contact with Statistics Poland, as I was invited to participate in a seminar led by Dr Kordos, who was then deputy director and soon thereafter director of the Department of Living Conditions.

Professor Domański also took part in numerous initiatives directly serving the goals of official statistics in Poland. He was involved in the organisation of national censuses in the years 1970, 1978, 1988, 2002, 2011, and 2021; he cooperated within mathematical commissions, prepared expert opinions, worked as a consultant and engaged in activities related to the Scientific Statistical Council under the President of Statistics Poland, the Methodological Commission of Statistics Poland, and the Statistical Council under the Prime Minister. When reminiscing about the beginnings of his work in official statistics, Professor Czesław Domański stated that:

There was excellent collaboration with the statistical office in Łódź and the authorities of Łódzkie Voivodship, particularly with directors Wiktor Pietruszka, Stanisław Kwiatkowski, and Wincenty Imieniński, especially during the preparations for the 1970 National Census. All the assistants from the department underwent a one-week training programme covering the topics, organisation and methods of conducting the census. After this training, we prepared future enumerators, primarily recruited from the University of Lodz. Z. Michałkiewicz, Assoc. Prof., serving as the Rector's Commissioner for the 1970 National Census, was responsible for overseeing the enumeration districts in the city centre and Widzew district. I participated in this challenging supervision, along with Prof. Michałkiewicz at various organisational levels of the 1970 National Census in Łódź. The 1970 National Census was originally scheduled to last a week but was shortened to Wednesday due to the 'December Events' on the coast (protests sparked by a sudden increase in the prices of food and suppressed by the Polish People's Army, resulting in at least 44 people killed). Nevertheless, the census was informally extended with earlier arranged individuals. This period appeared to bring scholars closer together and expand their areas of interest, both academically and professionally. In my case, it significantly expanded my collaboration with the Director of the statistical office in Łódź, Stanisław Kwiatkowski, as part of the Łódź branch of Statistics Poland. This collaboration led to the publication of the book *Biographies of Polish Statisticians* (Sylwetki statystyków polskich) in 1984. The book received considerable attention among the international community of statisticians. The meetings which I held with my first head of department, Professor Edward Rosset, at his home over several months, featured hours-long conversations and discussions focused primarily on demography and statistics and the future development of these disciplines; they have been of significant importance to the field of statistics.

Since 2002, Professor Domański has been a regular member of the International Statistical Institute (ISI).

Professor Czesław Domański's profound knowledge and competence have been recognised in various committees responsible for the development of statistical research and broader, national-level scientific research. Particularly noteworthy is his three-term membership in the Central Commission for Academic Degrees and Titles, membership in the Methodological Committee under the President of Statistics Poland, and his appointment to the Statistics Council under the Prime Minister for the years 2001–2002. Since 1987, Professor Domański has been elected to the Committee on Statistics and Econometrics of the Polish Academy of Sciences, where he served as the Vice Chairman during the 2008–2012 term.

Professor Domański's commitment in the service of Polish statistics has been acknowledged through numerous distinctions, among which he himself considers the following as the most significant: the Medal of the National Education Commission, the Officer's Cross of the Order of Polonia Restituta, the Bolzano Medal awarded by Charles University in Prague and the Jerzy Sława-Neyman Medal.

In addition to methodological issues, such as the theoretical foundations of nonparametric tests, methods for comparing nonparametric statistical inference procedures with parametric procedures, and small area statistics, Professor Czesław Domański's scientific research focuses to a large extent on its practical application, aimed at solving real problems within various socio-economic issues, particularly in Łódź and the Łódź region. These include studies related to:

- developing the Łódź scale of child and youth development;
- the statistical assessment of newborns' health and causes of infant mortality in maternity hospitals in the city of Łódź;
- constructing the Łódź operational risk card for cardiac surgery procedures;
- creating a Polish operational risk scale for the treatment of ischemic heart disease;
- statistical models of water consumption of Łódź residents;
- predicting water consumption in Łódź based on modified statistical and econometric models;
- using machine learning for forecasting household water demand in Łódź;
- analysing energy heat forecasts for Łódź residents;
- contributing to the development of Polish statistical thought and the work of Polish statisticians;
- upholding the academic tradition of Łódź;
- ensuring the quality of economics education in response to the expectations of Łódź entrepreneurs.

An important aspect of his scientific activity is his participation in and organisation of scientific conferences. Professor Czesław Domański has been for decades the initiator and main organiser of the 'Multivariate Statistical Analysis – MSA' international conference. As many as 41 editions of this conference have been held to date.

Another significant undertaking of the Professor was organising the 'Ethics in Economic Life' conference at the Salesian University of Economics and Management, with which he was affiliated since its establishment.

The list of all of the Professor's achievements, including scientific articles is extensive and goes beyond the scope of the current presentation.²

Professor Czesław Domański's 55-year work in the service of statistics have indeed yielded an impressive body of work across all areas of academic life related to official statistics. Professor Czesław Domański has always emphasised the necessity of collaboration between the academic community and practitioners, which best summarises this article:

The real confrontation of statistical methodology with specific issues related to official statistics creates a platform for discussion between empirical researchers and academic representatives. The experience gained, and above all, the successes in solving complex organisational and methodological issues have been the driving force for further research. It seems that the diversity of the problems to be solved, extensive discussions among practitioners and statisticians generate great satisfaction from participating in such events. My scientific research, as well as my organisational and educational path have always been associated with statistics thanks to many outstanding mathematicians, statisticians, econometricians and scientists whom I have met throughout my academic journey and whom I will always remember.

² A detailed description in this regard is provided in the works by Jędrzejczak, A. (2014). Profesor Czesław Domański – twórca łódzkiej szkoły statystyki nieparametrycznej. *Przegląd Statystyczny. Statistical Review*, 61(4), 453–458 and Jędrzejczak, A., & Kowaleski, J. T. (2013). Profesor Czesław Domański – życiorys naukowy. *Acta Universitatis Lodzianis. Folia Oeconomica*, (280), 5–33.