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SCIENTIFIC SCHOOLS REPRESENTED AT WROCLAW UNIVERSITY OF ECONOMICS

Wrocław University of Economics dates back to 1947 and is one of the oldest institutions of higher education of this type in Poland. It continues the tradition of the 19th century Lvov Academy of Trade which became an academic institution of higher education after World War One, very popular and respected by students, first, as the Higher School of Foreign Trade (since 1922), and then, since 1937, as the Academy of Foreign Trade in Lvov.

The dramatic history of World War Two resulted, among other things, in the annexation of the former Far Eastern Poland by the Soviet Union, a shift of Poland's border into the West, and the forced displacement of millions of Poles to the so-called Recovered Territories. A large number of Lvov's residents found their new homeland in Wrocław which was slowly beginning to rise from the ruins. Among the first settlers there were many lecturers from Lvov's colleges and universities, followed by their students.

The scholars from Lvov played a key role in establishing the Higher School of Trade in Wrocław (WSH). Its initiator was the former rector of Lvov University, and the then dean of Law and Administration Faculty at Wrocław University, Professor Kamil Stefko. Among his closest associates there were many lecturers from Jan Kazimierz University, Polytechnic University, and Academy of Foreign Trade. Suffice it to say that five of the first seven rectors of the WSH till the mid 1960s represented the Lvov academic circles, two of whom were from the Academy of Foreign Trade in Lvov: Rector Stefan Gómiak and Rector Krzysztof Jeżowski.

The WSH in Wrocław was unique on Poland's educational map after the war. In a country under the rule of the communist party, it was a private institution of higher education, whose students mostly were from cultured and middle class families, with education aimed at providing professionals

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for private and cooperative sectors, with syllabi covering Western economics body of knowledge, and with teachers who opposed the indoctrination of students notwithstanding the pressure of authorities. The college was exceptionally popular among students. During its first four years, almost 6,000 students enrolled, although the college offered vocational studies in just one faculty, without academic recognition, and in addition, because it was private, a tuition fee was required. The scale of teaching effort was great: in the academic year 1947/48, the WSH was ranked second by the number of students among the thirteen higher education institutions in Western and Northern Poland, just behind the University of Wrocław.

This reputation was mainly due to the high level of teaching faculty. In their respective disciplines, the lecturers were considered the best in Poland or in Europe. Among the earliest WSH lecturers were eight organizers and creators of scientific schools, which are still appreciated today as significant and state-of-the-art, also thanks to their disciples and followers. Professor Kamil Stefko laid the foundations for the School of Law and Civil Procedure, while Professor Tadeusz Bigo created the eminent Wrocław School of Teaching Administration and Administrative Law. Professor Stefan Ingłot – who taught economic history – was another distinguished scholar, founder of the School of Socio-Economic History, whereas Professor Stanisław Hubert organized the School of International Public Law and Law Theory. Professor Lesław Adam, the originator of the School of Financial Law, was a renowned educator of many economists and lawyers. Professor Jan Falewicz was one of the pioneers of econometrics in Poland, the founder of the School of Quantitative Methods which was later to flourish with many outstanding followers at the Wrocław School of Economics (WSE) and at the Wrocław University of Economics (AE, since 1974). A prominent geographer, Professor Józef Wąsowicz originated the Wrocław School of Cartography, and Professor Seweryn Wysłouch laid the foundations for the School of Historical Study of Political System and Law.

A register of distinguished scholars who were lecturers at the WSH is much longer. First mention is due to Professor **Wincenty Styś**, one of the greatest Polish economists of the 20th century, who was the rector of the WSE between 1956 and 1959 (himself a disciple to the great Polish scientists: Stanisław Grabski and Franciszek Bujak, and to famous foreign economists: Friedrich August von Hayek, Ludwig von Mises, Hans Mayer, Oskar Morgenstern). He did not originate a significant scientific school of his own, not only because of his premature death in 1960, but mainly

because of the doctrinal restrictions disabling a free development of economic research in the then People's Republic of Poland. The achievements by Professors Adam Chelmoński and Iwo Jaworski are also worth mentioning. The former was a representative of the Popular-National Union in parliament before the war, a deputy minister of justice, a member of the Codification Commission in the Republic of Poland, an editor of "Palestra" periodical, a co-author of many acts of parliament, and the latter – a distinguished specialist in the discipline of common history of state and law. Professor Jan Treter was a co-founder of the E. Romer Institute of Cartography in Lvov, and Professor Włodzimierz Boerner (a son of pre-war Poland's minister, Ignacy Boerner, and a collaborator of Minister Eugeniusz Kwiatkowski) was one of the predecessors of macroeconomic planning and regional policy in Poland.

Such a dynamic growth of the WSH was interrupted, mainly in its scientific dimension, in the late 1940s. Under the changed domestic circumstances (as the communist party seized total power) and in view of an exacerbated cold war abroad, the process of transforming the organizational structures of higher education, and revising the methodological foundations of science began. Social sciences, including economics, found themselves in a particularly difficult situation. By their nature, they are "multi paradigm sciences", using George Ritzer's concept (Ritzer, 2000, p. 315). Arguments between scholars of various views, currents, schools or orientations do not only refer to the empirical domain, but also to the principal ideas of epistemology, ontology, and methodology which underlie the research carried out. Hence, the necessary condition of their development is the scholar's freedom to independently choose a research problem, methods to solve it, ways of presentation of findings to other scholars and to the general public, and even preferred axiological categories. Social sciences, including economics, never imply a unique or unbiased scientific truth as is the case in natural and technical sciences, but the freedom of research allows to make this truth as objective as possible. The lack of freedom leads to some kind of dogmatization of science or even to its servility (K. Popper also believes that the freedom of scientific research is a basic condition to overcome the influence of scholar's local conditions and peculiarities upon the scientific results. See: K. Popper, *Nędza historycyzmu* [The Poverty of Historicism], Warszawa 1999).

Since the late 1940s, the real situation in Poland has been radically different from such paradigm. In spite of various fluctuations, interchanging periods of "liberalization" and "course exacerbation", economic sciences,

especially the oldest one in the group, i.e. economics, were in a very difficult position all the time. Economists were rigidly corseted by means of the imposed Marxist paradigm, and their roles were typically restricted to validating decisions taken by political bodies. The representatives of those currents and schools which were based on other ontological premises were eliminated deliberately, their research findings downgraded, their scientific careers deterred, further development of research fields initiated before World War Two was prevented, and the studying of economics carried out in the free world was impossible. The unconcealed ideological offensive aiming at a peculiar “democratization” of higher education was launched by communists at the beginning of 1948 (however the previous time was also distant from freedom needed by science). Higher education in economics was subjected to particular pressure because of the special meaning of economic issues for the authorities. The peak of the monopoly by Marxist economics took place in the first half of the 1950s. The First Congress of Polish Economists held in December 1950 brutally criticized the Polish “bourgeois pseudo-science” of economics, called for prevailing over “bourgeois petty theories in economic sciences” and applying “theory of socialist growth” under Polish circumstances. Words were followed by action. Many distinguished economists, including those with a left-wing social orientation, were removed from their chairs or their right to give lectures was reduced (the case of Professor Edward Lipiński), while others were forced to premature retirement (e.g. Professor Edward Taylor) or even were arrested (e.g. the former Rector of the Warsaw SGH, Aleksy Wakar) (Stankiewicz, 1998, p. 570-571).

In this context, one may better understand the question asked in 1997 by Professor Bożena Klimczak of the Wrocław University of Economics in the title of a paper published in “Argumenta Oeconomica”: *Why a Wrocław school of economic thought has not evolved* (Klimczak, 1997, p. 11-14). The author points at the political conditions which were the reason that it did not happen. In September 1950, the school was nationalized and began operating under the name of the School of Economics (WSE) until 1974, there was also a mass layoff of the academic staff. Among those laid off then were K. Stefko, T. Bigo, S. Wysłouch, S. Hubert, A. Calkosiński, and also Professor Wincenty Styś, a person who could have initialized the Wrocław school of economics, an independent thinker, a creative researcher, a talented teacher and organizer. Regrettably, he was refused along with many others the right to give lectures and to publish papers in the field of economics. Until his death in 1960, he was under constant surveillance by the security

service. Prohibition to publish and give lectures in economics, as well as the personal “exile” of Professor Styś to the Faculty of Philosophy and History at the Wrocław University were effective until 1956.

During 1956-1989, in spite of ongoing political changes, it was not a convenient time for the beginning of an original school of economics. The pressure of censorship was reducing powerfully the freedom of opinion and expression, access to scientific sources, including reliable statistical data, was limited. It is remarkable that such a school did not emerge within a Marxist paradigm. According to B. Klimczak, it was due to the lack of a scholar like Wincenty Styś, and no Marxist intellectual was able to fill gap.

Political issues were the reason why it was as late as in the second half of the 1950s that the first scientific schools emerged at the Wrocław school, and their development was seen in the 1960s and 1970s. It was still impossible to carry out economic research without ideological coercion, but new chances were given for research based on logic and mathematics. This particular “escape” towards quantitative research has resulted in many valuable achievements. It is not accidental that most scientific schools initiated then referred to statistical and mathematical methods in their economic research.

The originator of that research in WSE was Professor **Jan Falewicz** (1890-1965), the creator of the School of Quantitative Methods with many followers. The Professor’s merit was a modern and innovative use of recent achievements by the theory of mathematical statistics for the examination of microeconomic models. He was also one of the predecessors to the application of probability calculus, representative sampling and econometrics to microeconomic problems, because he propounded to describe economic events with laws what can be mathematically interpreted. He published in Polish first studies on sampling, analysis of corporate efficiency and profitability; among others: *Bieżąca kontrola gospodarności przedsiębiorstw przemysłowych* [Ongoing Control of Efficiency in Industrial Enterprises], 1949; *Rentowność, gospodarność, koszty* [Profitability, Efficiency, Costs], 1963. The research under his direction developed methods of discovery and measurement of the strength of relationships and of the description of relationships, mainly by means of econometric models. Professor Falewicz was a remarkable and rich personality; a Petersburg Polytechnic’s graduate is remembered by his disciples as a true Renaissance man, always filled with friendliness towards people. The Professor’s success can be measured by the brilliant careers of his disciples. All the six doctors promoted by him either created their own original scientific schools or

creatively continued the Professor's research (While presenting the achievements of scientific schools, a book *Wrocławskie środowisko akademickie. Twórcy i ich uczniowie. 1945-2005* [Wrocław academia. Creators and their disciples. 1945-2005], Ossolineum, Wrocław 2007, was used. The participants in the research were: Stanisława Bartosiewicz, Andrzej Bąk, Ewa Bogacka-Kisiel, Ryszard Broł, Agnieszka Bukietyńska, Jędrzej Chumiński, Maria Cieślak, Mirosław Karaś, Mirosława Klamut, Bożena Klimczak, Józef Koredczuk, Stanisław Krawczyk, Mirosława Kwiecień, Władysław Leśniak, Jan Lichtarski, Tadeusz Listwan, Marian Maciejuk, Krystyna Mazurek-Lopacińska, Danuta Misińska, Adam Nowicki, Walenty Ostasiewicz, Mieczysław Przybyła, Andrzej Rapacz, Bożena Rudnicka, Antoni Smoluk, Aniela Styś, Stanisław Urban, Lucyna Wasylina, Teresa Znamierowska.)

Undoubtedly, one of the most prominent followers of the School of Quantitative Methods of Professor Falewicz was **Zdzisław Hellwig**, a founder of the School of Statistics, Econometrics and Cybernetics. Many research problems propounded by him have been ground-breaking in Polish science, and his achievements rank high globally. Professor Hellwig graduated from the WSH, and obtained his PhD here as one of the first (1958). He played a significant role in shaping a modern profile of the school, while he initiated exploration in cybernetics, econometrics and operational research in the early 1960s, and also introduced modern fields of study connected with computer science.

The scientific interests of Professor Hellwig embrace the three research domains: statistics, econometrics and cybernetics. In the first, his works concerned with statistical hypothesis testing are worth mentioning. The results reached prove particularly useful in those fields of science where researchers suffer from the scarcity of complete data, but need to examine distribution of a variable (e.g. in economics and medicine). Professor Hellwig contributed significantly to the development of econometrics in Poland. His works: *Linear regression and its applications to economics* (1960) and *Stochastic approximation* (1965) have been translated into English and demonstrate the weaknesses of a traditional way to examine relationships between statistical variables. The leading idea of those works is that regression function is the approximating function, therefore the regression theory may use the mathematical tools supplied by the theory of approximation. As a consequence of such an interpretation of a regression function, the concepts of a distance random variable as well as spectrum and trace of random variable were put forward. Professor Hellwig introduced the

following concepts to the scientific usage: multivariate comparative analysis, measure of development, pattern of development, path of development, optimum trajectory of development, aggregate and its information potential, which are used by researchers and experimenters from diverse scientific disciplines, and also outside economic sciences. An important stream of Professor Hellwig's research concerns was dealing with the implementation of computers into solving economic problems. He was the editor and co-author of one of the earliest scientific books on computer science in Poland: *O maszynach cyfrowych* [On digital machines], 1968.

Professor Hellwig was also involved in consulting and teaching. During the period from 1958 to 1974 he was a UNESCO expert, and a visiting professor at many universities around the world, among others, in Japan, England, and Nigeria. He was twice awarded honorary doctoral degrees: in 1985, from the Krakow University of Economics, and in 1994, from the Prague College of Economics.

His influence on disciples and collaborators has always been significant. Among 34 doctors promoted by Professor Hellwig, there are 18 professors today. Tadeusz Bartosiewicz, Stanisława Ostasiewicz, Walenty Ostasiewicz and Wojciech Rybicki focus their scientific interests on statistics and econometrics, Andrzej Gospodarowicz deals with quantitative methods in finance and banking, Witold Miszczak is involved with the time series analysis, Tadeusz Borys with qualimetrics and trans-border statistics, Stefan Forlicz with economics of information, Adam Nowicki with the engineering of management information systems, Jerzy Wawrzynek with experiment planning and quality control, Adam Kopiński with managerial accounting and controlling. Professor Urszula Siedlecka, who died in 2004, was a distinguished specialist in the theory of forecasting. Many disciples of Professor Hellwig work at different domestic and foreign universities. Czesław Domański is the head of the Institute of Econometrics and Statistics at Łódź University, Grzegorz Gorzelak works in the Institute of Americas and Europe at the Warsaw University, Leon Dziembala – in the Department of Statistics at the Katowice University of Economics, Ginter Trybuś – in the Institute of Management Sciences at the WSB-National-Louis University in Nowy Sącz, whereas Jerzy Korczak is a Professor at the University of Strasbourg (In 2006, Professor Korczak returned to his Alma Mater and took the chair of retired Professor Elżbieta Niedzielska, of the Department of Theory and Informatics, in the Institute of Informatics), and Elżbieta Trybuś – a Professor of Systems and Operations Research at California State University, in Northridge, USA.

Stanisława Bartosiewicz has significant scientific achievements as the initiator of the School of Econometric Modelling. The most important field of her theoretical and methodological research has been econometric modelling. In this area, she presented a ground-breaking monograph *Ekonometria. Technologia ekonometrycznego przetwarzania informacji* [Econometrics. Technology of econometric processing of information] (1976), and the whole process of economic information processing by means of econometric models. In addition to the standard econometric methods, she put forward some original contributions to the theory of econometrics. Professor Bartosiewicz focused among other things on initial stages of econometric modelling, i.e. on specification of model variables, measurability of variables, availability of data, information gaps, and on the selection of analytical form of a model. Another major research course developed by Professor Bartosiewicz is operational research. She put forward an original approach to multiple objective programming based on the game theory.

It is worth highlighting that the School created by Professor Bartosiewicz has many followers. Among nine doctors promoted by her, there are six professors. Wiesław Pluta carries out research on quantitative methods applied in corporate finance. Edward Nowak deals with quantitative methods applied in accounting. Józef Dziechciarz and the group under his guidance continue research on econometric modelling, especially modelling under heterogeneity of data sets, qualitative data modelling, and development of robust regression techniques. Krzysztof Jajuga carries out his research in two areas. The first one is the statistical and econometric data analysis where his major contributions include methods of multivariate non-homogeneous data analysis using distribution mixtures and methods of fuzzy sets theory. In this domain, he is well-known among world's econometricians and statisticians associated in the International Federation of Classification Societies. The other area comprises issues of finance in a broad sense, especially financial markets and risk management. Krzysztof Jajuga is a pioneer of applying mathematical methods to analyze financial data in Poland; he was also first to introduce advanced finance into Poland's research and teaching. Ludmiła Waszkiewicz deals with bio-statistics and health service management, Jerzy Jakubczyc – with finance and banking, and Anna Krefft – with statistics and econometrics.

Another disciple to Professor Falewicz, who initiated his own scientific School of Mathematical Programming, was **Władysław Bukietyński** (1928-1996). He dealt with quantitative methods supporting decision processes in

economics. His works relate to problems of production optimization, distribution of resources and investment allocation. In the work *Niektóre problemy optymalizacji dyskretnej* [On some problems of discrete optimization] (1975), he formulated a certain general class of problems of so-called dynamic choice. He was working on the reduction of some important optimization problems to discrete programming problems. He also dealt with the use of mathematical methods in the economy, and with methodological issues resulting from economic systems.

One important aspect of his works was the analysis of how a centrally managed economy should divide national income into consumption and accumulation, so as to prevent economic stagnation on one hand, and not to overheat economics, on the other hand. It is worth emphasizing that Professor Bukietyński was one of Poland's pioneers studying the possibilities of economic modelling with computers.

The disciples carry on and develop research projects initiated by Professor Bukietyński. Among 16 doctors promoted by him, four are now professors. Stanisław Krawczyk focuses his research on a new concept of logistics as a branch of science which integrates management, operations research, informatics, and quantitative methods. Ewa Konarzewska-Gubala deals with multiple objective optimization of decision taking within a broad domain of operational research, Juliusz Siedlecki – with equilibrium theory, and Andrzej Małachowski specializes in economic informatics.

Maria Cieślak created the School of Forecasting which is distinctive by its emphasis on the entire process of forecasting, not just on the quantitative methods of making a forecast. This means that the formulation of forecasting goals, forecasting premises, underlying assumptions of forecasting methods, and testing the consistence of the components of forecasting procedure with the selection of forecasting methods are emphasized. The domain of the School's research involves the deliberation on the essence of forecasting, and the analysis of problems generated while forecasting economic and social processes.

Within the field of economic forecasting, two main currents of research by the group emerged: one dealing with microeconomic forecasting which focused specifically on forecasts for business entities, and the other, with an emphasis on demographic analysis and demographic forecasting. The latter is connected with modelling and forecasting of fertility, life duration, life expectancy, and population aging. The group under the guidance of Professor Cieślak was also working on methods of warning forecasts, and on

determining a degree of confidence towards forecasts using the theory of uncertainty of measurement derived from metrology.

Professor Cieślak has promoted 12 doctors, and there are now 5 professors in their group. Her disciples and closest collaborators include Danuta Strahl, who deals with quantitative methods in regional economics, Paweł Dittmann, the author of numerous works on economic forecasting, and Ireneusz Kuropka, who specializes in demographic forecasting. Barbara Radzikowska, who untimely died in 2000, was the author of valuable books and papers on demography, while the research interests of Zdzisław Pisz have evolved into social policies, labour and education policies.

It is worth emphasizing that it is the second generation of researchers using mathematical methods in economics who have initiated their own scientific schools in Wrocław University of Economics. **Antoni Smoluk**, a disciple to Professor Hellwig, originated the School of Economic Metrology. He contributed to the development of the approximation theory and can be regarded as one of the main authors of invariant approximation, which is a particularly important branch of mathematical modelling. Professor Smoluk was also carrying out research on ordered sets. He gave accurate definitions of several concepts: equation, generalized derivative, a mode of integral, measurement, and quality. Among 12 doctors promoted by him, there are now four professors. The followers of Professor Smoluk creatively develop the ideas formulated by him. Wanda Ronka-Chmielowiec specializes in financial mathematics and in insurance, Stanisław Heilpern deals with the theory of forecasts, Jan Łyko adds to the theory of measurement and group choice, whereas Andrzej Baniak is involved in statistical comparisons of oligopolies.

The research course initiated by Professor Falewicz, who proposed to apply mathematical methods in economics, presented many famous achievements. The most quantifiable fact is that 50 researchers are today professors, and more than 250 people have been granted doctoral degrees. Owing to their research, Wrocław University of Economics ranks today among the top scientific centres in Poland.

The development of quantitative research in the 1970s allowed also to initiate the School of Economic Informatics. Its origins and growth are mainly connected with **Elżbieta Niedzielska**, the PhD student of Professor Falewicz. Her research into methods and tools of management and accounting information system design was unprecedented in Polish science. Her collaborators, Henryk Sobis and Jacek Ochman had significant achievements in the domain of accounting information systems integration.

Adam Nowicki deals with strategic enhancement of information system in corporate management. A distinguished contributor to the School was the prematurely deceased Professor Andrzej Baborski (1936-2001) whose principal interest among many other problems in cybernetics and informatics was artificial intelligence. This research is continued by his followers: Mieczysław Owoc and Jerzy Korczak. Jadwiga Sobieska-Karpińska and Andrzej Malachowski have got noteworthy achievements in the field of economic communication. Jan Stępniewski is involved with the implementation of IT in enterprises, Andrzej Bytniewski with informatics for accounting, and Jacek Unold with dynamics and rationality of information systems. Leszek Maciaszek is an Associate Professor of Computing at Macquarie University in Australia, and the author of many books and papers on enterprise information systems, databases, object technology, and software engineering. Altogether there are almost 90 people who were granted doctoral degrees within the School.

Another research course that has been successfully developed for many years at the Wrocław University of Economics is management. The originator of the Empirical School of Management was **Ber Haus**. The distinctive feature of most research programmes and projects carried out within the School has always been their empirical origins, whereas the key methodological principle has been induction. Identification and description of processes and trends occurring in the economic reality, with their analysis and assessment allowed to formulate many practical recommendations (utilitarian value), and also to develop the achievements of organization and management sciences (cognitive value).

Many scientific findings of this School have been matching European or world standards in the respective domains. Among other things, these are the research findings of Professor Haus on team forms of work organization (*Formy organizacji pracy w przemyśle* [Forms of work organization in industry], 1962, *Ewolucja struktur organizacyjnych przemysłu* [Evolution of organizational structures in industry], 1983), organization and operation of multi-plant companies (*Organizacja i funkcjonowanie przedsiębiorstw wielozakładowych* [Organization and operation of multi-plant companies], 1975), economic planning in an enterprise, including production planning (*Planowanie produkcji w przedsiębiorstwie przemysłowym* [Production planning in an industrial enterprise], 1969), assessment methods of effectiveness of organizational innovations, principles and methods of corporate resources management (*Planowanie techniczno-ekonomiczne w*

przedsiębiorstwie [Technical and economic planning in an enterprise], 1978 – co-authorship).

The accomplishments of Professor Haus in educating research staff are enormous. He promoted 68 doctors, of whom today sixteen people are professors. Inspired by Professor Haus's ideas, they continue his research topics. Jan Skalik deals with management system design, Szymon Stempin with corporate resources management, Ryszard Lubniewski with supply logistics, Barbara Olszewska with corporate strategy, Jan Lichtarski and Stanisław Nowosielski with corporate management, Rafał Krupski with strategy and management methods, Zdzisław Jasiński with production and labour management, Małgorzata Gableta with human potential economics, Stefan Wrzosek with financial foundations of corporate decision-making, Zofia Hasińska and Wanda Kopertyńska with human resources management, Halina Towarnicka with investment strategies of enterprises, Henryk Jagoda with economic cooperation of companies, Grażyna Osbert-Pociecha with change management, Tadeusz Dudycz with corporate value management, and Czesław Zając with corporate social potential management. Adam Jońca, who died in 1994, had significant achievements in production management.

The School of Management Praxeology and Methodology initiated by **Arkadiusz Grossman** (1913-1986) has valuable accomplishments. The research directions propounded by him and continued by his followers include specifically: praxeological aspects in managing an institution, research methods of organizational structures, praxeological approach to decision-making processes, research methods for capital groups, modern concepts of management, application of efficiency criteria to human resources management and to personal function assessment, organizational behaviours and organizational culture, problems of quality of executive staff training, and methods of active education by means of business games.

Staff management, inspired by the research of Professor Grossman, is now the focus of Tadeusz Listwan and his team. Wrocław centre ranks today among the top ones in Poland, with considerable scientific achievements in among other things, strategic staff management, organizational culture, organizational behaviours, and change management. Mieczysław Przybyła continues the research focused on assessment methods of organizational structures. Kazimierz Perechuda is involved with the problems of modern management methods, whereas Józef Koziński deals with capital groups management. Jacenta Łucewicz (1952-2002), who prematurely died, had valuable accomplishments in the field of an organization's sociology.

Among other researchers dealing with management problems, Bolesław Wersty (1925-2003) and Stanisław Kielczewski also have significant achievements. Professor Wersty was mainly interested in the economic analysis of a company, which supported decisions made throughout the process of corporate management. Professor Kielczewski's interests have evolved from industry economics to industrial policy, and to development strategies in industry. This research is now carried out by his disciples and followers: Andrzej Kaleta, Leon Jakubów and Krystyna Moszkowicz.

Altogether Wrocław researchers in the field of management are proud with many successes. This has resulted from the scientific work of 33 professors and more than 180 doctors promoted by them. Professor Haus has been awarded a honorary doctoral degree from Katowice University of Economics, and many faculty members have been awarded numerous prizes.

The organizers and co-authors of the Wrocław School of Accounting are **Stefan Górniak** (1900-1983) and **Bolesław Siwoń** (1914-1996). The history of this school is very long, because it is a continuation of scientific research carried out in Lvov, and of professional experience (e.g. stock exchange functioning).

In post-war Wrocław, Stefan Górniak, Bolesław Siwoń and Jan Treter were stimulating the science of accounting in the whole of Poland. The common distinctive feature of their research was the developing of accounting theory and improvement of economic practice. The three fields determined the rank of Wrocław School of Accounting, i.e. accounting theory and balance sheet examination (S. Górniak, Ryszard Stadtmüller, Danuta Misińska, Mirosława Kwiecień, Andrzej Kardasz); monetary measurement of economic parameters (B. Siwoń, Stanisław Jagiełło, Wiktor Malc) and cost accounting (Danuta Soltys, Zbigniew Luty, Mieczysław Kufel).

Other significant contributors to the Wrocław School of Accounting were also Alfred Liwacz specializing in balance sheet examination and financial accounting, as well as Henryk Sobis and Jacek Ochman who focused on IT in accounting.

Important contributions to the development of accounting science have been recently connected with controlling which emerged as an interdisciplinary branch combining traditional accounting with management science, as well as with application of econometrics and informatics in accounting. Another recent development is the emergence of new disciplines such as managerial accounting and financial accounting. Considerable achievements in this respect have been attained by a team under the

guidance of Professor Edward Nowak, director of the Institute of Accounting, and also by Professor Danuta Soltys, head of the Department of Accounting and Controlling in Enterprise, in the Economic and Engineering Faculty.

The Wrocław School of Accounting includes 15 professors who promoted almost 80 doctorates.

Professor **Lesław Adam** (1908-1979) was the originator of the School of Financial Law. His research interests highlighted relationships between law and economics. He dealt with the fundamental problems of general finance theory and financial law, with a special emphasis on financial control, government budget and tribute law, and self-government entities finance.

Equally valuable are his treatises on socialist finance. Under a centrally managed economy, his research on financial control was of particular importance. They exemplify properly combining theory with financial practice. His papers on self-government entities finance belong to the same course. He highlighted issues which are still relevant.

The research directions initiated by Professor Adam were followed by his disciples: Józef Kaleta, Maria Myszkowska and Wanda Romanowska. Professor Kaleta was involved in environmental finance and technological advancement finance, as were his PhD students: Grażyna Borys, Ewa Bogacka-Kisiel, Marek Łyszczak and Jerzy Sokolowski (now all professors at Alma Mater). International finance was the domain of Professor M. Myszkowska, who is now followed by her doctorand, Jacek Karwowski. Wanda Romanowska specialized in corporate finance, and her research is continued by Jacek Uchman.

The political and economic breakthrough in 1989 resulted in new domains of research such as financial markets and institutions, commercial banking, legal and economic aspects of public finance.

Professor Adam promoted 29 doctoral degrees granted both by the WSH, and by the Law Faculty of Wrocław University, of whom 10 of his disciples became professors and promoted more than 100 doctors.

Bolesław Winiarski created a School of Economic and Regional Policy. He has been continuing the research initiated by Professor **Włodzimierz Boerner** (1908-1974), and also launched broad research projects on regional development within an international project "Regional development in Europe" under the auspices of UNESCO, intermediated by the Committee of Spatial Domestic Economy in the Polish Academy of Sciences. He focused on the issues of economic revitalization of underdeveloped areas, regional development programming, and regional policy. As a consequence of those

studies, which covered in addition to Poland's regions also northern areas in Africa (in his capacity as a UNO expert), a resource-based concept of regional development was formulated in which stimulation of regional development is seen as an integral part of a general socio-economic policy of government conducted and performed with the significant participation of regional and local governments. The final results of the research in the project of which Professor Winiarski was a co-reporter on issues of regional policy and regional planning in Europe with Professor M. MacLennan from the University of Glasgow, were published in several volumes in Paris and Brussels, and added to the support of opinion that common regional policy is needed in the European Community.

The research team under the direction of Professor Winiarski have intensified their efforts after the political breakthrough of 1989 in Poland. His collaborators and followers carried out research on issues inspired by him, and also started their own interesting scientific careers. Stanislaw Styś is a distinguished specialist in the field of food policy and control of marketing adaptation processes in agriculture. Mirosława Klamut specializes in structural research of economic development and European integration. Ryszard Broszkiewicz deals with modelling of spatial-economic structures, whereas Kazimiera Wilk is involved with the economic integration of countries in Central and Eastern Europe. Jan Borowiec focuses on monetary integration, Ewa Pancer-Cybulska on the regional policy of the European Union, Leszek Patrzalek on territorial self-government finance, and Stanislaw Korenik on spatial economy.

Professor Winiarski promoted 14 doctorates, and 9 of his disciples are now professors who promoted 23 doctorates.

An important research field developed in the Wroclaw University of Economics for many years has been marketing. **Teodor Kramer** is the author of two schools: Marketing and Economics of Trade, whereas his disciple, **Aniela Styś** initiated her own School of Service Marketing. The beginning of Professor Kramer's research team was in the early 1960s, when the official doctrine denied a category of market as such, and its dynamic meaning for the country's development. This affected research problems undertaken by the team, and teaching programmes. At the end of the 1960s, Professor Kramer pointed at the inefficiency of central planning and at the need of efforts for the start of the market's function and mechanisms. During the 1970s, market processes under restrictions, different aspects of consumption processes, and the development of the service sector were extensively studied. Research on market and consumption was particularly

important cognitively. Spatial approaches dominated which allowed to support decisions by regional policy bodies under a centrally planned economy, and gradually, also by industrial and trade companies.

The research initiated by Professor Kramer at the end of the 1960s have been continued by his collaborators and disciples, particularly by Professor Józefa Kramer, his closest collaborator and wife. Her research dealt with consumer behaviours and market analysis. The followers develop their original scientific fields, inspired by the initial ideas of their Masters. Krystyna Mazurek-Lopacińska specializes in marketing research and consumer behaviours. Grażyna Światowy also studies consumer behaviours, Urszula Kałużna-Drewnińska is involved with marketing in trade and services, and with business negotiations, whereas Barbara Iwankiewicz-Rak focuses on management of non-profit organizations. Marek Drewniński specializes on global marketing and commodity exchanges, Janusz Marak on marketing research and strategies, Janusz Olearnik on economics and organization of services, Zdzisław Knecht on marketing management. Professor Kramer also promoted doctorates of Eugeniusz Michalski (who specializes in marketing and market analysis) and of Leszek Żabiński (management and marketing); both are today distinguished researchers and scholars outside Wrocław.

Professor Aniela Styś has excellent scientific achievements. The special part of her research is taken by the service area. On the ground of the three sectors theory, the research of Professor Styś and her team identified a relationship between the development of services and the economy as a whole. The results of the studies on the real transformations of the service area in Poland added to global and European maps of economic development. By means of special measures, a gap which should be closed in Poland's economy was determined. That proved very useful in the context of EU integration processes.

The Schools of Marketing at Wrocław University of Economics comprise the research results by 16 professors who promoted almost 100 doctorates.

The newest Faculty of Regional Policy and Tourism in Jelenia Góra was organized in 1969, at first as a branch, and since 1982, as an External Faculty. The School of Urban Economics was inspired by the research of Professor **Adam Ginsbert-Gebert** (1914-1994), while Professors **Józef Krynicki** and **Stefan Kornak** (1920-2005) created the School of Tourism and Tourist Economics. Jelenia Góra Faculty has got also another well-known School of Data Analysis, created by Professors **Danuta Strahl** and **Tadeusz Borys**.

Professor Ginsbert-Gebert has initiated research on urbanization processes and their commune aspects, and his team was concerned with housing issues and the impact of the infrastructure on urban development, living conditions in various towns studied by means of surveys, and also the economic aspects of environment protection. His accomplishments may be measured by more than 400 books and papers, and 23 doctoral promotions, five of which are in Wrocław. His disciples continue his research. Ryszard Brol has the most significant achievements dealing with local and regional development, economics of urban development, and structural transformations of rural areas and their multifunctional development.

Professors Krynicki and Kornak should be regarded as predecessors of research on tourist movement and tourism as a social experience, and also tourist market and tourist economics. The school was shaped in two basic research currents: tourism and tourist movement (under the direction of Professor Krynicki), and the tourist market and tourist economics research (under the direction of Professor Kornak). As a consequence of the research, knowledge on broad issues was gained on the mechanisms of the tourist market, on methods and instruments of tourism management and their local and regional entities management. The important aspect of the research was marketing management in tourism. The publications in this area were seminal in the Polish marketplace during the system transformation. Today, Professor Andrzej Rapacz continues those studies dealing with tourist economics management and consumption of tourist goods and services, with special emphasis on structural and spatial changes, and the applicability of public-private partnership in the process of a tourist product design.

Another important scientific school developed in Jelenia Góra is the Data Analysis School originated by Professor Danuta Strahl, the doctorand of Professor M. Cieślak, and Professor Tadeusz Borys, the doctorand of Professor Z. Hellwig. At the beginning, their close collaborator was also Professor Michał Montygierd-Loyba, a mathematician. The research by Professor Strahl contributed to the development of multivariate comparative analysis, especially methods of variables selection, and synthetic measures of socio-economic development. Her research into methods of structures discrimination applied to regional investigations are of special importance. Professor Borys is concerned with theories of quality and qualimetrics, and also with issues of sustainable development and quality of life. His workings in this field deal with sozoeconomic calculation, indexes of sustainable development and its programming, and environmental risk management.

The second generation of the School's adherents includes Marek Walesiak and Andrzej Bąk. Professor Walesiak deals with methods of statistical comparative multivariate analysis, in particular with methods of marketing data analysis, as a renown specialist in the field of classification methods, and an author of the so-called generalized distance measure. Professor Bąk studies preferences, computer simulation methods, micro-econometrics, methods of multivariate comparative analysis, and programming of data analysis algorithms. There have been 19 doctoral degrees granted within the School.

In addition to economic sciences, other disciplines of science are also represented at the Wrocław University of Economics, at the Engineering and Economic Faculty.

Józef Berak (1913-1998) originated the School of Phosphate Chemistry. His interests covered investigations of phosphorus which is important for metallurgy and of its metal compounds. The research aimed to establish phase theoretical foundations of removing phosphorus from ferrous alloys. Another field of research successfully developed by Professor Berak and his team was chemistry of lanthanides. The research focused mainly on calcium apatites: fluorapatite, chlorapatite and hydroxylapatite. Teresa Znamierowska, Władysława Szuszkiewicz, Halina Podsiadło and Irena Szczygiel are followers of Professor Berak with considerable accomplishments. There has been continued and intensified research into lanthanide phosphates, and into yttrium with elements from lithium and beryllium families.

Jerzy Ziobrowski (1924-1988) originated the School of Fermentation and Biosynthesis Technology. The major scientific topics related to deep and surface citric fermentation, lactic fermentation, automation and information technologies in the production of bakers yeast and feeding-stuff yeast. Research into fermentation technology are of special value.

The professor's ideas have been continued and developed by his disciples. Professor Kazimierz Zmaczyński, who died in 1996, was involved with fermentation technology. Professors Władysław Leśniak, Tadeusz Miśkiewicz and Ewaryst Elimer specialize in food biotechnology, and Professor Katarzyna Szoltysek in food ecology. It is worth emphasizing that there is a third generation continuing the research of Professor Ziobrowski. Jerzy Pietkiewicz and Waldemar Podgórski, promoted by Professor W. Leśniak, deal with bioprocess engineering, food biotechnology, and environmental biotechnology. Edmund Cibis and Zbigniew Garncarek, promoted by Professor T. Miśkiewicz, carry out research into food

biotechnology and environmental biotechnology. Within the School, there have been 25 doctorates.

The scientific achievements of Professor **Jan Sondel** (1895-1975) who created the School of Agriculture Intensity and Intensification are also appreciated. The School was involved in agricultural advancement and its proliferation, including social agronomy. The theoretical and practical foundations for agricultural consulting were laid. The research was carried out into intensity of agriculture and conditions of agricultural production intensification. The reserves of agricultural production were assessed and the conditions to activate them examined. Special attention was paid to the problems of economics and the organization of animal production, particularly dairy cattle farming and milk production. The research by Stanisław Urban, a distinguished specialist in marketing of agricultural and food products, agribusiness and trade, ranks high within the School. Tadeusz Jankowski deals with organization and management of small enterprises, and Franciszek Kapusta with agribusiness. It is worth highlighting that some School's graduates are scholars in England, USA and Libya. Altogether, there have been 40 doctorates promoted within the School.

A turning point in the history of the Wrocław University of Economics was the 1989. Following the change of the political system, new conditions to develop theoretical and empirical research in economics emerged, particularly into events accompanying the transformation of Poland's economy such as environment protection, information markets emergence, privatization of state-owned enterprises, collective action, institutional aspects of transformation. There emerge now two large research teams aspiring to create their original schools of economics.

The first one was set up around **Bogusław Fiedor** – a director of the Institute of Economics, and current rector of the University of Economics. The interest with economic aspects of environment and natural resources protection dates back to the late 1970s and the early 1980s, while inspirations resulted not only from the generally increasing importance of ecological conditions for modern business processes, but also from contacts with other academic centres, particularly with the AGH University of Science and Technology in Kraków (Professor Anna Jankowska-Kłapkowska), the SGH Warsaw School of Economics (Professor Adam Ginsbert-Gebert) and University of Warsaw (Professor Barbara Prandecka).

Research into diverse aspects of interrelationships between business activity and natural environment was carried out in various economic disciplines: economics (theory of economy), finance, regional economy and

management. However, it was kept intensively going only in the Institute of Economics (formerly the Institute of Political Economy) and is perceived today as a Wrocław school of environmental economics. Its distinctive feature, different from other scientific centres also involved with natural resources management and conservation (e.g. at Białystok Polytechnic, AGH in Kraków, University of Economics in Kraków), consists in aiming at the close linkage of those issues with the general theory of economy, at its enhancement by considering micro- and macroeconomic conditions of business. Since 1991, Professor Bogusław Fiedor has been perceived as the author and leader of the school, in his capacity as director of the Institute of Economics, and since 1996, head of a new Department of Ecological Economics, initiated by him. The team under his direction has significant publishing accomplishments with more than one thousand publications, including more than 50 books and monographs which were frequently awarded prizes from the Ministry of National Education, and with considerable research activity, including more than a dozen projects within international programmes.

Publications and research projects by the Wrocław school of environmental economics combine the theoretical accomplishments of environmental and natural resources economics showing ways to modify economic instruments and finance mechanisms supporting environmental conservation in Poland, including brand new economic and financial solutions in this field.

The other of the two mentioned teams was organized under the leadership of **Bożena Klimczak**, head of the Department of Microeconomics and Institutional Economy, and Andrzej Matysiak, who has been a professor in this department for many years (now the head of the Department of Microeconomics at the Faculty of Regional Economics and Tourism in Jelenia Góra). Applying the theory of a new institutional economics, the team of Professor Klimczak has developed an original model of case studies to investigate microeconomic events in Poland's transforming economy. Among other issues, economic consequences of privatization of state-owned enterprises, temporary forms of privatized state-owned enterprises, the impact of business and professional self-government on private market governance during transition have been studied. The important topic of interest was the ground-breaking analyses of interest groups, organized as business and professional self-government. As a consequence of the research, six doctoral degrees have been granted, and many prize-awarded

books and papers have been published in well-known domestic and foreign journals.

Professor Klimczak has also successfully published on business ethics. Her publications focus on ethical aspects of privatization of state-owned enterprises, on self-regulation of activities by interest groups, professional ethics, and public confidence.

Over the sixty years of existence of the Wrocław University of Economics, many original economic schools have emerged. This would not have been possible without distinguished professors, who joined their professional careers with the school. They brought together many young researchers, shaping their scientific interests, capabilities and characters. With this particular relay race of generations, the Wrocław University of Economics became known as a valuable scientific and teaching centre. Most of the schools emerged still under the so-called real socialism, i.e. during a period when doctrinal restrictions were impeding freedom of research and of teaching. It is worth emphasizing however, that we survived without strict subjecting of scientific research to the then effective socio-economic doctrine. We also managed to keep in touch with international science and its accomplishments thanks to a relatively large openness to the world and many contacts with foreign universities since the 1970s. That was particularly true in the case of more pragmatic or instrumental disciplines such as management, economic statistics and econometrics.

The revolutionary system changes initiated in 1989 have also enforced the rule of freedom to carry out scientific research and teaching, thus allowing to develop all disciplines within economic sciences. In particular, any doctrinal restrictions regarding access to global scientific achievements have been removed. New generations of young scholars have come whose education and training for future research took place under completely changed social and economic conditions. They are excellently equipped to continue the accomplishments of their predecessors, and in a more distant future, to initiate also new research courses.

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