



LOGISTICS IN SCIENTIFIC DISCOURSE

Andrzej Bujak¹, Radosław Jeż²

¹WSB University, Institute of Logistics

²University of Economics in Katowice, Faculty of Social Logistics

Abstract: The research activities within logistics are dispersed, intertwine each other, function at the same time in economics and management, which undoubtedly is contributing to the discussion and questioning of certain principles and dependences within its scope. The objective of the study is to try and make distinction when it comes to the location of logistics in wider scientific discourse – in economic sciences: Economics/Management. In addition, the intention of the authors was to show the logistics as a science perfectly associated with one of the above mentioned areas of research.

Keywords: logistics, scientific discourse

DOI: 10.17512/znpcz.2017.1.1.18

Introduction

The determination of the subject of scientific studies as well as the scope of research very often specifies the boundaries between sciences. Knowledge is becoming more and more universal and is showing characteristics both of cognitive and normative nature. Therefore, there has been an increase in voices among scholars about the proper classification of a scientific discipline, i.e. rigid determination of boundaries within a given science. The discussions around logistics and, in particular, disputes concerning the place of logistics in science have lasted for several years. They concern, in particular, theoretical foundations or research conducted in the area of logistics. The plurality of views, the abusive use of the term logistics have led to the evolution in this area. The state of knowledge and the state of science, as determinants of the development of the modern world, are often the results of a desire to achieve and satisfy human needs. The need to acquire knowledge, education, or self-fulfilment has become in today's world the major goal of the young generation. However, to talk about a science or knowledge we have to make the sound distinction and indicate the theoretical basis that constitute the fundamental right to classify science, including logistics, as a domain of science or perhaps treat it as a scientific discipline.

Economic sciences – division and classification

Economic sciences are one of the scientific domains¹ in Poland in accordance with the Resolution of the Central Commission for Degrees and Titles of 23 June 2003 on the determination of domains of science and arts and scientific and artistic disciplines (Journal of Laws of 2003, No. 40, item 586). The law specifies the principles and ways of classifying the domains. As was stipulated in it there are three scientific disciplines within the framework of economic sciences: "economics", "management science" and "commodity science". The Resolution of 23 April 2010 amending the resolution on determining the domains of science and arts and scientific and artistic disciplines (Journal of Laws of 2010, No. 46, item 636) introduced a fourth scientific discipline within the domain of "economic sciences", i.e. "finance".

It is worth noting that all three disciplines included in the canon of economic sciences such as "economics", "management science" and "finance" are developing in a dynamic way, are characterized by different scientific approach, and use diverse, very often different research methods. Unfortunately, the research activity in the above mentioned areas makes the existing borders in the areas of science disappear and there is an increasing lack of an unequivocal and clear separation of the areas of scientific research.

In economics the primary emphasis is on studying behaviours of individual operators and the relationships between them in terms of managing available resources in a situation of unlimited needs. Among the areas of research, economic sciences include: theoretical foundations of socio-economic policy, international economics, history of economic thought, economic history, analysis of growth and economic development, analysis of economic cycles occurring in the economy and its individual sectors, analysis of the public sector, analysis of the functioning of markets, spatial economics, etc.

In research involving economics, we rely on hypotheses and build models for relationships between real and nominal variables which occur in the economic process. Research in the field of economics has, as a basis, fundamental economic categories, such as: the rationality of the behaviour of economic operators, economic balance and economic efficiency as well as optimized decision in economy-wide view. The major goal of economic approach of a studied problem is to explain an economic phenomenon and to refer to the phenomena described by economics in an evaluative way (positive economics and normative economics). Positive economics is based on objective knowledge about the studied reality and the phenomena occurring in the economy. It does not assess, does not draw conclusions, does not verify, does not judge whether they are right or wrong. The economics formulates theoretical rules, looking for versatile tools that can be used

¹ Education within the scope of economic sciences takes place in the following fields of study: Economics, Finance and accounting, Quantitative methods and Information systems, Management, Management and production engineering, Management and marketing, Land management, Economy and public administration, Tourism and recreation, Information technology and Econometrics, Logistics, International Economic Relations, Economic analytics, Commodity science.

to broadly describe the whole of economic processes. Normative economics, on the other hand, makes interpretation and evaluation of described economic facts. It formulates subjective judgements, reviews and evaluations, therefore it is also called subjective economics. An economist has the right to individually assess the theory formulated within positive economics, and to predict the impacts of the economic activity as well as draw own conclusions. Normative economics proposes a solution of an economic situation, which makes it more practical and closer to significantly wide range of researchers.

In a framework of sciences on management some interactions can be detected related to transformation, functioning and development of organizations, including companies in the SME sector, as well as in a wider view (transnational corporations) and in public institutions, i.e. health care, government administration, self-government, etc. The point of reference in the management sciences is the rationality of decisions and the smooth functioning of operators, which translates into achieving planned objectives of the organization. It should be noted that the subject of interest of management sciences is the history of organizational thought and shaping the management and governance structure. The activities of an organization, within the framework of the management sciences should be considered in several areas of research:

- by type of organization: enterprises, non-profit organizations, administrative units, virtual organizations and others;
- by functions of management: planning, organizing, motivating, controlling;
- by processes: basic processes, supporting processes, service processes;
- by area of activity, e.g. production management, logistics management, quality management, marketing management, management of technological processes, etc.
- by resources: material resources, human resources, technology resources, resources of knowledge and information, financial resources;
- by levels of management: strategic, tactical and operational managing;
- by systems and methods of management: e.g. system management, change management.

On the other hand, finance, as a new scientific discipline², covers assertions and theories referring to creation, collection and storage of financial resources, examines phenomena related to human activity, in which the flow of money occurs, and, in particular, all phenomena related to the financial sphere of the economy. The research in the field of finance includes, in particular, the analysis of causes and effects of the cash flow between economic operators. The finance discipline analyses motives and criteria of the decisions taken by the economic operators. The finance sciences also include studies of financial reporting, i.e. the preparation and analysis of financial information for decision making. In particular, the area of research in the field of finance includes:

² Resolution of the Central Commission for Degrees and Titles of 23 April 2010 changing the resolution on the determination of domains of science and arts and scientific disciplines and artistic (Journal of Laws of 2010, No. 46, item 636).

- by subject: public finance, corporate finance, personal and households finance, financial institutions (including banks, insurance companies, investment and pension funds), international finance;
- by function: investing (especially when the goal is to gain financial income), raising capital, financial markets, financial policy, analysis and transfer of financial risks, redistribution of financial resources (e.g. through the tax system).

The separation of management sciences from economics within economic sciences – outline of the problem

The term "science", which is seemingly unambiguous and not bringing larger disagreements, can be understood in multiple ways. Economic theories, the purpose of which is to explain facts occurring in the economy, are closer in terms of procedures to theories of natural science than mathematics because they are responsible for the observation of economic life. Science has for long been providing more and more specialized and valuable knowledge about the universe, its structure, constituent units and the dynamics of their change. This knowledge is a set of subjectively communicable and verifiable assertions, but with different level of acceptance in respect of various objects of research and the phases of development of the science on this subject (Musiał (ed.) 2011, p. 14). The disintegration of science, and, on the other hand, the interdependence of various areas of study involve a number of consequences. They may be found in, for example, introducing new specialisations, creating new learning pathways, new faculties or lectures and talks of free choice. A wide access to knowledge as well as information overload have become the cause of increasing number of scientific disciplines and the transition towards specialization.

Reflections on the separation of the scope of research assigned to the management and economics sciences, should have reference to the assessment of the scientific achievements in the field of these disciplines. The reference point should be a reflection, or the search for it, on the methodology of science, which will clearly help define the research field (Ciesielski 2013, p. 4-7). The term *methodology* is accompanied by a dismal ambiguity, because we identify it with the name of technical procedures of conduct within the framework of a certain discipline. Then, it is a more expressive synonym for *method* (Blaug 1995, p. 13). However, it increasingly means the study of ideas, theories and key policies and rules of thinking on the subject.

Sciences of management, according to *communis opinio doctorum*, are young sciences (the first years of the 20th century), not only in relation to sciences such as mathematics, physics or astronomy, but also compared to most social sciences and they use methodology of other sciences relating to the practical sphere of human activity. They deal with reality, which is constantly changing and is subject to perturbations. Sciences of management, situated in this aspect of science, seek to formulate theoretical generalizations relating to practical activities of enterprises. They are applicable and lead to the formulation of conclusions and opinions.

Economics is one of the sciences, the most general and abstract, it is a sub-discipline of science that is assigned to empirical sciences (See: Ajdukiewicz 1975). It formulates regularities on the functioning of the economy as a whole³. The division into microeconomics and macroeconomics perfectly organizes and assigns individual activities of entities or relationships between them to a given field. There are no sufficient arguments for the sciences on management were included in the macroeconomic or macrosocial areas, with the exception of the functioning and development of specific institutions related to these areas (Sudoł 2012, p. 38). Any temptation to extend the subject of interest within the framework of sciences on management to the management of macrosystems, raises a lot of controversy⁴. In the considerations undertaken on the subject of separating economics from management it would be very constructive to ascertain that instead of searching for, accenting and sometimes exaggerating the differences between microeconomics and management sciences, more cognitively and practically fertile seems to acknowledge their complementarity, with simultaneous noticing the differences and respecting their specifics. One can go one step further and claim that the most interesting and creative research appears at the intersection of these two fields of research.

Unfortunately, common areas as well as research methods very often cause excessive development, i.e. the "inflation" (Ciesielski 2013, p. 5) of the research problem associated with cognitive or methodological gap. It is therefore important to appropriately classify or categorize within the discipline. Both economics, management and finance use in their analyses the same research methods, e.g. mathematical methods or colloquially known observations or interviews found in social methods. They also use the achievements of related areas such as sociology and psychology. The difference of a part of research methods is that:

- economics uses synthetic and abstract categories more extensively, and for the purposes of the request it uses mathematical, statistical or logical tools,
- management sciences mostly relate to the description of specific, real-world, practical problems, and in request they mainly use inductive methods and tools as well as methods that are included in the range of operational research,
- finance significantly uses mathematical and statistical methods and enriches its own analysis with financial tools reserved for the proper group of economy operators.

The characteristics presented above allows to qualify the individual parts of scientific achievements within an appropriate scientific discipline, i.e. *economics*, *finance*, or *management sciences*. The interdisciplinarity of a scientific problem, a multitude of views, assumptions, hypotheses and scientific reports within social sciences introduce research areas that are complementary, which causes difficulties in the separation of the scope of research. This problem concerns, to a large extent,

³ It is also worth noting that economics has, apart from its positivist approach, its other face relating to the normative approach where, basing on personal beliefs of the researcher, conclusions are formulated and then implemented in the economy. This trend is closer to the management sciences.

⁴ Makrosystem understood as economy as a whole. Referring to the theory of economics or economic policies of the state can cause total blurring of the boundaries between management and economics.

macroeconomic and financial problems affecting the economic reality. Using the above assumptions, it seems appropriate in this situation to determinate the weight of a research problem and to appropriately locate it in a proper area. The following assumptions can be used (Journal of Laws of 2010, No. 46, item 636):

- when the focus of research is located on the theory of decision making that results from the theory of microeconomic choice, then this is the area of the discipline of economics,
- when the focus is on decision taking related to the allocation, acquisition or transfer of money, then this is the area of the discipline of finance,
- if the main stress is on practical directives concerning specific decisions, then this is the area of the discipline of management science,

On the one hand, it should be pointed out that the most interesting scientific area very often appears at the interface of two disciplines, and the conclusions from the analysis made bring new cognitive opportunities in a given scope. Therefore, an interdisciplinary tolerance is needed, which will help make creative and valuable analysis within two and sometimes three disciplines, however, still falling within the scope of economic sciences.

On the other hand, the paradox of science is that the more codified scientific knowledge is, more accurate and hermetic in the selection of immanent frameworks, the more often it turns out to be far from reality, which should be the determinant of its appointment and implementing.

The doctrine of logistics

The doctrine of logistics shall be understood as the sum of (synthesis) beliefs and claims of a particular scientific school (school of logistics), which characterises their main scientific views. What is then the school of logistics? Generally speaking, it consists of logisticians sharing the same views, that is to say such views that define the foundations of logistics. It takes the base views of the school of logistics for granted and considers them to be true (Szołtysek 2016). In science, such base views are called paradigms and they are the basis for the development of science. Derived from the Greek, "*paradeigma*" means the pattern and a paradigm is a set of theoretical assumptions, laws and techniques used by members of a scientific community. Scientists formulate and develop a paradigm, trying to explain the behaviour of certain aspects of the real world, which is explored through experiments. If we built a valid model and it is detailed and based on a paradigm, the experiment should give the result like the one from a model simulation. The progress of knowledge in the context of the paradigm is by way of accumulating knowledge, i.e. collecting new empirical data and improving and correcting the existing theories. A worse situation may happen when we encounter anomalies and the results of the experiment do not confirm the accuracy of the model, and the explanation of new results requires the creation of new, competing theories. As Kuhn put it "the awareness of failure of existing rules is the prelude to look for new ones. [However], a scientific theory which gained the status of a paradigm is valid as long as another one appears that will be able to do this function, [because] the

decision to abandon one paradigm is always a decision for the adoption of “another one” (Szołtysek 2016). However, there is no doubt that paradigms are the key to scientific progress as they act as signposts and facilitate moving in science, enabling discovering, making conclusions or generalizing (Szołtysek 2014).

However, it seems that a paradigm of logistics that is safe, reliable and distinctive from other fields of exploration should be the following statement (Szołtysek, Twaróg 2013): “the paradigm of logistics is its flow orientation, i.e. the existence of physical and informational flows, which in the process of governance are shaped in such a way as to achieve availability of products within assumed time and space values. These values are determined by the requirements (needs) of end customers (consumers, beneficiaries)” (Szołtysek 2012). The paradigm presented here exactly captures the essence of logistics as it represents the way of thinking in terms of flows, which are generated by logisticians by way of logistics management in order to achieve the availability (to material goods or places) under the agreed rules and priorities of actions (Szołtysek 2015). In addition to this definition, it is worth pointing out together with J. Szołtysek that these are the principles of efficiency: economic efficiency, favourability and effectiveness, and priorities are: profit, quality of life or safety. Increasing meaning of logistics defined as concept of managing goods and information flow influence on competitive position (Matwiejczuk 2014). The shaping of flows involves making relevant decisions, of both operational and strategic nature. Making decisions in logistics involves building some projects which can be represented in a number of components having certain, specific volumes (Szołtysek 2015). The driving force behind the decision-making mechanism are the effects of such decisions and its value (utility). It is argued that development of enterprises after taking such decisions requires creating new forms of integration within enterprises (Golembaska 2012).

The emergence of logistics in business applications as a research area in the 1980s resulted in increased interest in the concept of logistics among both theorists and practitioners, mainly representatives of transport as well as various areas of management. It was a response to the intensive search for new ways to obtain competitive advantage of market operators by taking relevant logistical decisions. In addition, it is more complicated when searching for cost savings while aiming to offer high logistics service we find reasons to neglect the former by placing emphasis on the latter, as happens in the case of social logistics. These applications are sometimes very distant from the traditional areas of activity of logistics. Then, doubts arise as how to qualify a specific solution to a family of logistics applications and logistics itself. In such cases the research community begins discussions over what is a natural area of application of logistics and whether logistics has colonial inclinations as it is trying to control the whole of economic reality. Hence, logistics as a field of knowledge of application type is especially prone to such situations when the theorists are facing the task involving making decision whether to qualify a given application to this or another type of logistics (Twaróg 2012). Logistics includes a wide collection of business undertakings that are integrally resource concentrated (Bozarth, Handfield 2013). It is for that reason

a principal point for many enterprise's efforts to achieve competitive position. Often, companies have found solutions through logistics that improve competitiveness.

Conclusions

Logistics is a field of practical knowledge, which is reflected both in the development of new and improvement of existing concepts of management of material and information flows, as well as in practical applications in many areas of everyday life. Such an approach to logistics, as a rule, places it in the area of management science and, as a research and practice area it substantially distinguishes it from engineering or military logistics. Therefore, logistics shall be located in the management area, though there may be doubts as to its borders as a sub-discipline of management sciences.

Literature

1. Ajdukiewicz K. (1975), *Logika pragmatyczna*, PWN, Warszawa.
2. Blaug M. (1995), *Metodologia ekonomii*, Wydawnictwo Naukowe PWN, Warszawa.
3. Bozarth C., Handfield R.B. (2013), *Introduction to Operations and Supply Chain Management*, Pearson Education, Boston.
4. Ciesielski M. (2013), *Trudności w określaniu problemu badawczego w naukach o zarządzaniu*, „Przegląd Organizacji”, nr 1.
5. Gołemska E. (2012), *Współczesne trendy w kształtowaniu wizji logistyki przyszłości*, „Gospodarka Materiałowa i Logistyka”, nr 6.
6. Journal of Laws of 2003, No. 40, item 586: Resolution of the Central Commission for Degrees and Titles of 23 June 2003 on the determination of domains of science and arts and scientific and artistic disciplines – Uchwała Centralnej Komisji ds. Stopni i Tytułów z dnia 23 czerwca 2003 r. w sprawie określenia dziedzin nauki i dziedzin sztuki oraz dyscyplin naukowych i artystycznych (M.P. 2003 nr 40 poz. 586).
7. Journal of Laws of 2010, No. 46, item 636: Resolution of the Central Commission for Degrees and Titles of 23 April 2010 changing the resolution on the determination of domains of science and arts and scientific disciplines and artistic – Uchwała Centralnej Komisji do spraw Stopni i Tytułów z dnia 23 kwietnia 2010 r. zmieniająca uchwałę w sprawie określenia dziedzin nauki i dziedzin sztuki oraz dyscyplin naukowych i artystycznych (M.P. 2010 nr 46 poz. 636).
8. Matwiejczuk R. (2014), *Kompetencje logistyki w tworzeniu przewagi konkurencyjnej przedsiębiorstwa*, Wydawnictwo Uniwersytetu Opolskiego, Opole.
9. Musiał G. (ed.) (2011), *Rozwój ekonomii jako nauki ze szczególnym uwzględnieniem tendencji do specjalizacji*, Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, Katowice.
10. Sudół S. (2012), *Nauki o zarządzaniu*, PWE, Warszawa.
11. Szoltysek J. (2012), *Paradygmat logistyki a paradygmaty w logistyce*, [in:] Kauf S. (ed.), *Logistyka i inne koncepcje zarządzania w naukach ekonomicznych*, Uniwersytet Opolski, Opole.
12. Szoltysek J. (2014), *Przesłanki i założenia koncepcji logistyki społecznej*, „Gospodarka Materiałowa i Logistyka”, nr 2.
13. Szoltysek J. (2015), *Pryncypium logistyki*, „Logistyka”, nr 1.
14. Szoltysek J. (2016), *Logistyka*, [in:] Kauf S., Płaczek E., Sadowski A., Szoltysek J., Twaróg S. (eds.), *Vademecum logistyki*, Difin, Warszawa.

15. Szoltysek J., Twaróg S. (2013), *Koncepcja logistyki społecznej na tle paradygmatu logistyki*, [in:] Szoltysek J., Trzpiot G. (eds.), *Demograficzne uwarunkowania logistyki społecznej*, „Zeszyty Naukowe Wydziałowe Uniwersytetu Ekonomicznego w Katowicach. Studia Ekonomiczne”, nr 175.
16. Twaróg S. (2012), *Logistyczne aspekty zarządzania łańcuchami dostaw krwi w Polsce*, Uniwersytet Ekonomiczny w Katowicach, Katowice [doctoral thesis – not published].

LOGISTYKA W DYSKURSIE NAUKOWYM

Streszczenie: Badania naukowe przeprowadzane w zakresie logistyki są rozproszone, przeplatają się wzajemnie i mają zastosowanie jednocześnie w dziedzinie ekonomii i zarządzania, co niewątpliwie przyczynia się do prowadzenia dyskusji i kwestionowania pewnych zasad i zależności w zakresie ich zastosowania. Celem badania przeprowadzonego w artykule jest próba odpowiedzi na pytanie, gdzie zlokalizować logistykę w szerszym dyskursie naukowym – w naukach ekonomicznych: ekonomia/zarządzanie. Ponadto intencją autorów było pokazanie logistyki jako nauki doskonale związanej z jedną z wyżej wymienionych dziedzin badawczych.

Słowa kluczowe: logistyka, dyskurs naukowy