Economic and logistic research methods

Anna Kowalczyk
Faculty of Management, Czestochowa University of Technology,
19 B Armii Krajowej Str., 42-200 Czestochowa, Poland
E-mail address: annkow07@wp.pl

ABSTRACT
In this paper, the methods for economic researches used in i.e. logistics are presented. The concern of economic researches is important for scientists and for businessmen. The knowledge of methods and their skilful application enables the optimization of management and of cognitive processes.

Keywords: methods, researches, science

1. RESEARCH METHODOLOGY

Method is a consciously and coherently applied way of conduct or procedure in order to obtain particular goal, it can be of practical or theoretical character. It is also used by people for recognition or improvement in the conditions of living. It is required in the behaviour of humans for both cognitive process, designing, production, financing, managing, treating, as well as for other activities [1]. It is the organized collection of various techniques, procedures, organizational solutions and instruments enabling the efficient and effective achievement of goals. Synonyms for such “method” term are: technique, technology, strategy, algorithm. Thus, we should not talk about the methodology in particular dissertation, but about the method. Instead, methodology is general knowledge (art) of developing social, natural and technical research methods, methods in formal sciences (mathematics, logic) and in other sciences. Methodology is the field of science coping with empirical methods of science [1]. It describes and analyses the concerns related with the activities of cognition
process, such as: general observation and measurement, comparison, modelling, experiment, case study, testing, developing scenarios, empirical verification of theory etc. It is the science about development of methods. The general science methodology is theory of applied semiotic principles (the principle of using symbols, coding), as well as of laws and rules from formal logic for purpose of scientific activity [3].

The methodology of economic researches comprises of general (framework) principles of creation, within the limits of the existing fields of science, the knowledge explaining the laws ruling in the economic processes. Such principles are subordinated to falsification requirement, that is understood as the establishment of theory able for verification with means of confrontation with the evidence from empirical facts. The majority of economic theories are set out with means of quantitative rules, among which relations and qualitative proportions are the most important (expressed in money) [4].

Research methodology in the management sciences comprises of the interdisciplinary rules for formulating the theoretical statements and practical directives in the field of efficient and prospective organization of teams of people. Interdisciplinary character of management sciences is based on the created theory and practical solutions following logical compilation of knowledge about economy, praxeology, sociology, psychology, ergonomics and laws [5]. Methodology in such field of science is of project and prospective character in large extent, what means that the vision of future events is the most important. The realistic research paradigm is predominant and it is executed with means of critical analyses for the cases of good and bad management [6].

2. THE ESSENCE OF SCIENTIFIC RESEARCHES AND ITS EXECUTION

The essence of scientific method is the objective and organized attempt to the research on stipulated phenomena and rational conclusions made on the basis of results from such researches. Researcher, when using the scientific methods, eliminates individual ideological options from the course of science, emotions and attitude and sentiments. It is used for truth and for the society with means of discovered truth and formulated opinions in favour of such values, that are compliant with the spirit of humanism. The scientific method is the system clearly determining the rules, concepts, hypotheses, tools, materials, information, activities and cognitive processes applied in the researcher’s conduct, required in the explanation of particular scientific concern. Establishing the proper method at the beginning of scientific research is decisive for the success of whole scientific task, and its lack leads on the route of chaotic observations, unrelated analyses and accidental conclusions [7]. Economy experts research the way, in which with means of scarce resources the needs of socially organized people can be satisfied. They do such thing with description of logic in manufacturing, distribution processes, as well as in the consumption of goods and the role of public institutions in such processes [8].

Scientific researches are very young disciplines of science what means that many even basic categories, terms and truths are variously formulated. Also the nature of management sciences influence on such diversity. The key function as applied sciences is the forecasting function, thus in the management sciences practical traces are predominant, but also theoretical traces must exist in such framework, because otherwise practical knowledge would be at least superficial [9]. Management sciences are related with many sciences, thus the
analyses from the field of other sciences should be located in such area, but they cannot be predominating. In the global and dynamic scientific reality on management, they must identify, diagnose and forecast the emerging challenges with means of own methodical potential and on behalf of company [10]. Description of the scientific and practical process for verification of component conditions and combinations of transformations should facilitate the formulation of explanations by the companies on the sources of survival and development in the frame of current economy. Economy researches are activities located in the general cognition theory framework: it is a type of rational cognition (other than irrational cognition based on the oblivion, experience, enlightenment, ecstasy). Such cognition is subordinated to the verification, verifiability or falsifiability criteria for proposed theorems: when some theory on economy is not proved, it can be rejected in the practice [11].

The objectivism in the economy research is expressed in theories formulated in isolation from strictly settled interests, from politics and from discrepancies in beliefs. A researcher coping with the settled economy concerns is under strong influence of subjective wills of giving grounds to favourite theory. Traditional research methods in the economy sciences were based on various types of induction (generalization based on transfer from details to principles and whole theories) and on forms of deducted conclusions on the basis of proved general theories [2]. Such methods enable logical formulation of logically isolated beliefs, whereas they are insufficient for the establishment of complex economic systems. The establishment of more and more complex economic structures and modern management techniques makes that further development in economic cognition is not possible without development of methodology, the establishment of well-functioning research workshop. Economic researches led in traditional way can be used only for multiplication of old theories, impeding the findings on new economic discoveries [12].

In the conditions of growth and with the importance of innovation and electronic techniques in the researches on economy, general principles of logical reasoning are not sufficient, vast databases and universal indicators in the analysis are not sufficient. Innovative and expert processing techniques and analysis of data about economy are required, creating models resembling the economic reality, making simulations for development of economic situation in various conditions, risk assessment and the assessment of probability of untypical accidents [13]. Researches on economy can be performed with means of several analyses, that are listed and described below in Table 1.

Table 1. Types of researches.

| Statistical analysis | - Quantitative description of the state for economic and social events: commonly used quantitative instruments for stipulation of average level (central tendency) for researched measurable feature, quantitative instruments for stipulation of average dispersion level for the units in the statistical group with regard to the variables in the researched feature, descriptive means for asymmetry and concentration in the empirical distribution (structures); - Settling the character and intensity in the relations among the features: the instrument for the analysis of cause and effect relations of variables and its “coexistence”, quantitative |
determination of power, shape and direction of relation with means of applied correlation calculus methods (interdependency) and regression calculus (increase) for dependant and independant variables.

- **Phenomena dynamics researches**: establishing the indexing methods and increasing tendency calculus (trends), periodical fluctuations and accidental fluctuations (random). Both indexing and elimination of fluctuation in time-related calculus are of great importance in reporting and planning the economic events [13].

### Mathematical analysis (mathematical economy, financial economy):

**Essence**: it copes with the research on the economy events in broad sense with means of advanced mathematical techniques, such as the analysis of time series or dynamic programming. Mathematical economy covers explicitly theoretical aspects of micro- and macro-economic analysis, without the empirical verification of resulting dependencies.

- Types of instruments: mathematical models for economy, production and market, classical mathematical, functional and multi-value analysis, the analysis of stochastic processes and theory [14].

### Econometrical instruments:

- **econometrical models**: static and dynamic, linear and non-linear, single and multidimensional, cause and effect models, symptomatic models, models for growth tendency, auto-regressive models, macroeconomic models, structure models, demand models, economic situation cycle models
- **econometric forecasts**: forecasting on the basis of classic trend model, forecasting on the basis of adaptive models, long-term econometric forecasting, forecasting for qualitative phenomena, forecasting with means of analogies
- **instruments for econometric analysis of production**: econometric analysis of manufacturing costs, econometric analysis of profitability threshold, manufacturing analysis and for effectiveness of labour, diagnostic function of cost models
- **instruments of econometric market analysis**: demand analysis

### Economy analysis:

- analysis of manufacturing results (size and structure of production, quality, modernity, rhythm of production etc.), the assessment of income from sales and financial result (amount and structure of income, operational and balance result, profitability etc.) analysis of own costs (size and structure of total costs, level of own costs etc.), the analysis for management for manufacturing elements (exploitation of machines, devices, fixed assets, worktime, consumption for materials etc.), the effectiveness assessment for manufacturing elements (productivity of capital, productivity of labour etc.), the assessment of the economical condition of the company (size, structure and level of wear for fixed assets, number, structure and qualification of staff, financial condition etc.), the analysis of social and welfare condition of staff [15].
3. CONCLUSIONS

In the papers the methodology for scientific researches was described, that is systematically applied in scientific researches in the field of economy and logistics. The methods stipulated above are used in the logistics, i.e. in the research on dependency between applied tools and effects.

References


(Received 02 April 2017; accepted 20 April 2017)