ISSN 1822-8038 (online)
INTELEKTINĖ EKONOMIKA
INTELLECTUAL ECONOMICS
2020, No. 14(1), p. 113-129

EVALUATION OF THE ADAPTABILITY OF SCIENTIFIC THEORIES FOR THE DEVELOPMENT OF ACCOUNTING INSTITUTE

Nataliia SEMENYSHENA, Nadiya KHORUNZHAK

Ternopil National Economic University
State Agrarian and Engineering University in Podilya
Kamianets-Podilskyi, Ukraine

Iryna SADOVSKA

Lesya Ukrainka Eastern European National University, Ukraine

DOI: 10.13165/IE-20-14-1-07

Abstract: *This study is devoted to the development of theoretical foundations and the formalization of the method for assessing the adaptability of existing scientific concepts for the purposes of developing accounting, and is based on an analysis of the advantages and disadvantages of scientific concepts when applied to research on accounting and the development of its theory. The article uses empirical analysis for assessment of the feasibility of applying a specific scientific concept, formalized in accordance with reasonable criteria. These criteria include: grouping based on the presence of common features; analyzing the principles of compliance with the principles of the concept of accounting; and empirical assessment of the impact of the concept on the methodology of accounting through predicting the negative consequences of its application.*

Research results indicate that the application of various scientific concepts and theories in the development of accounting does not always contribute to the solution of accounting problems and tasks. In order to minimize the risks of choosing a false basis for scientific research in the field of accounting, a method for evaluating the effectiveness of the concepts of scientific change has been proposed.

The novelty of the proposed approach is that, unlike the existing ones, it allows the mathematical identification of the concept's adaptability and is based on digital values. Thanks to its use, an informed choice of the most effective concept for researching and solving accounting problems is ensured, which makes it possible to avoid choosing a false basis of scientific research.

Keywords: *Scientific concept, Accounting, Accounting theory, methodology.*

JEL: *M4, M40, M41.*

1. Introduction

The modernization of accounting and the improvement of its organizational and methodological foundations require a balanced approach. The decisive role in this process is played by the scientific substantiation of the ways of solving this problem through the formation of an appropriate frame of reference. In modern conditions, there are a number of different methodological concepts, the use of which allow for the formulation of logically-systematized provisions related to the development of accounting theory and the formation of an effective system thereof. However, a critical review of the scientific literature indicates that their principles in this area are not widely applied. The description of these theories is mainly carried out with a goal that is more informational rather than being based on research, which negatively affects the results of scientific research aimed at improving the theory of accounting.

The application of various concepts in the process of the research of scientific changes, in combination with the analysis and determination of the reasons for their occurrence and the consequences of the impact on the accounting system, will allow for the identification and evaluation of possible alternatives and the building of logical models with more advanced characteristics and parameters. Thanks to the correct choice of the fundamental concept of research, it is possible to achieve the best positive results, which in modern conditions are characterized by a transition from quantitative accounting parameters to the plane of qualitative approaches. That is, the basic law of dialectics is confirmed – the transition of quantitative changes into qualitative ones. New qualitative changes are accompanied by the emergence of appropriate new quantitative parameters, which must necessarily be taken into account when modernizing accounting.

2. Literature review

In modern conditions, the assertion of a change to the position of information attributes is true. It acquires the characteristics of an independent object that can exist outside of a person and a material carrier. In line with this, there is a need to change the approaches to its formation. From the point of view of conceptual foundations, a clear definition of the problem of management needs, taking into account the possibilities of their solution in the context of the current level of development of other sciences, can serve as the basis for such a process.

The theoretical and methodological foundations for the further development of accounting in Ukraine, as Malyuga (2006) noted, taking into account international tendencies and experience, as well as national social and mental specificity, form the philosophical basis of this science. At the same time, the scientist emphasizes that, for the development of accounting theories, in order to form an accounting methodology in Ukraine, the Western positive direction is unacceptable. The main, decisive direction of development for domestic accounting, according to the scientist, should be methodological unity. In line with this, the normative nature of accounting theories should be carefully observed.

Fully supporting the first part of the Malyuga's position, it should be pointed out that the categorical nature of the further conclusion contradicts, in a certain way, the thesis about the development of the theoretical and methodological foundations of accounting in Ukraine taking into account global trends, and also sets a framework for the development of domestic accounting theory. This approach, despite the presence of firm ground (namely, strict regulation), significantly reduces the possibilities and prospects for the harmonization of accounting, especially through the use of recommendations of international standards.

Along the way, it should be noted that, compared with research on ways to improve accounting, in the modern scientific literature not enough attention is paid to the development of its theory.

Some scholars express the opinion that the complexity of developing a new accounting theory is due to a number of stereotypes that have developed and are supported by the academic community (Holov 2011).

Others, on the contrary, note that the need to single out the metatheoretical level of accounting is one of the most promising areas of development in the accounting theoretical knowledge system, and its solutions will streamline existing developments and shape the further development paths of individual accounting scientific theories (Lehenchuk 2012).

The reason for such disagreements may be the fact that scientific publications mainly state the need to develop, or at least develop accounting theory, but in fact such studies in Ukraine, with a few exceptions (Holov 2011; Lehenchuk 2010; Popper 1983), are not too common.

The problem is not only the development of the concept, but also the recognition that there is no consensus among scientists about the fundamentals of its development. On this occasion, Sokolov (2000) argued that in its essence everything that now seems to be the theory of accounting is either unnecessary scholasticism of the type "subject and method," or the inspection of regulatory documents that relate more to the field of jurisprudence than to accounting. At the same time, deep ideas, postulates, and paradoxes are taken as the bases of the theory, and are not considered at all.

Despite this, many countries, including Ukraine, have chosen such a direction as adaptation to international standards as the basis for the formation of national accounting concepts. Such an approach should not be considered sufficiently substantiated and balanced, since the practice of Ukraine shows that there is no particular take-off of economic indicators after the introduction of national accounting standards which are based on the provisions of international standards. From this position, one should consider the indicated direction of development of the scientific concept of accounting theory as insufficiently effective.

Unegbu (2014) carried out research in this direction. His research aims to follow the evolution of accounting theory – however, he concludes the opposite. Unegbu notes that it is the introduction of international standards that allows for the solving of the problem of increasing the efficiency of activity, because this is promoted by unity in the matter of generating reporting data on expenses, financial results, etc.

It is necessary to agree with the positive result of standardization in matters of accountability. Indeed, thanks to the application of uniform principles and estimates, reporting becomes understandable to a wide range of users, including foreign investors. However, this is the basis for the growth of economic efficiency – it is important that accounting standards are formed on the basis of sound research and theories.

Many other scientists devote their work to the problems of accounting theory and its development in the context of various basic principles.

Kabir (2010) examines the development of positive accounting theory (PAT) and compares it with three standard accounts of science: Popper (1959), Kun (1996), and Lakatos (1970). PAT has been one of the most influential accounting research programs during the last four decades. One important reason which Watts and Zimmerman (1986) have used to popularize and legitimize their approach is that their view of accounting theory is the same as that used in science. Thus, it is important to examine how far accounting has been successful in imitating natural science, and how the development of PAT compares with the three standard accounts of science.

Kaya (2017) is guided in his research by a positivistic theory for the formulation of conclusions about the development of the theory of accounting. Considering this, he takes as a basis three hypotheses: bonus plan hypothesis, debt hypothesis, and political cost hypothesis. These hypotheses will continue to be a rich field of empirical research and the basic questions that they raise are still relevant today.

It should be recognized that in international scientific thought, and in recent years in the publications of Ukrainian authors, more and more attention is being paid to the development of accounting theory. In Ukraine, the focus is now on institutionalism, however in different historical periods other approaches were taken as a basis.

Therefore, to determine the concept of the development of the theory of accounting, it is legitimate and expedient to analyze the history of scientific accounting thought, and those postulates that were taken as a basis by relevant groups of scientists in a given period of time. The most widespread, as the review of scientific literature shows, were theories: theories of various series of accounts; balance theories; economic and legal theory; logical-mathematical, organic, tax, macro- and microeconomic, social, scholastic, and formal theories; structural and metaphysical theories; as well as a number of others.

In general, it should be noted that each theory has both disadvantages, which have a corresponding impact on the general principles of the development of accounting theory as well as its methodological and organizational basis, and advantages. In this context, an important task that the researcher should undertake in order to obtain a positive result in their scientific research is the correct assessment of the influence of the chosen concept on the research result.

The analysis of literary sources shows that foreign and domestic scientists have made numerous attempts to research and use various kinds of scientific concepts in relation to scientific changes in accounting. In particular: the theory of falsifications of Popper (based on the ideas of F.N. Bacon); the implicit personal knowledge approach of Polanyi; the paradigmatic approach of Kun; the research programs of Lakatos; the evolutionist method of Tulmin; "epistemological anarchism" (Feyerabend 1993; Hartley 1928; Polani

1958; Popper 1959; Weber 2005; Dipiaza and Jekklz 2003; Kun 2002; Kuter 2000; Lakatos 2008; Popper 1983), and "institutional theory" (Takeda 1982).

It should be noted that even among these theories there are those that contradict or, on the contrary, organically complement each other. In particular, the theory of falsification (Popper 1959), which is based on critical rationalism (a system of methodological rules), can most likely be opposed to epistemological anarchism (Feyerabend 1993), according to which the only principle that does not hinder progress is the principle of proliferation (permissiveness). It was thanks to the latter that significant breakthroughs occurred in accounting science, in particular the development of the theory of duality, and in recent years the theory of sources of information (which, due to the computerization of accounting, can be classified as accounting).

Against the background of logical orderliness and resolution of the modern accounting system, it is possible to form completely new theoretical foundations through the use of scientific views that do not fit into the methodological rules, or that even violate them.

Among other examples, the development of paperless accounting in modern conditions should be noted, the existence of which, until the advent of the computerized form of accounting, was considered fiction. In accordance with this, the thesis of Feyerabend (1993) – that anarchism helps to achieve progress in any sense – is quite fair. It is thanks to going beyond the traditional view that a number of breakthrough theories have emerged (kinetic, relativity, dispersion, quantum, Galois (field theory), etc.).

On this basis, we can conclude that going beyond the orderliness of the system and using the principle of "everything is allowed" will allow the formation of a new accounting theory. This principle, justified Feyerabend, in its essence organically fits into the postulates of the theory of implicit personal knowledge (Polani 1958).

After all, the fact that phenomena with characteristics which go beyond the limits of well-known theories do not exist at all is not scientifically supported. Ignorance of them does not mean their absence, because the level of development of science and technology at a certain period of time does not allow them to be discovered and investigated.

From the point of view of accounting, this situation can be illustrated by the following example. In the early stages, credentials were recorded without adhering to the principle of duality, but this does not deny its presence and instead most likely indicates limited knowledge.

Accordingly, it can be argued with high probability that a breakthrough in accounting theory can be, for example, the justification of the principle of the trinity or another similar development. In general, these theories in modern conditions have great advantages compared with those based on the application of logic, the accumulation of knowledge, and the competition of programs. Such theories as the logical-methodological (Popper 1983), paradigmatic (Kun 2002), or research programs (Lakatos 2008), play an important role in scientific research of course, including those devoted to accounting issues.

The result of the application of their principles is the formation of more perfect principles, and not the achievement of a new qualitative level that meets the criteria of the invention.

The institutional theory – in our opinion – is similar, from the standpoint of the result (Semenyshena 2011). Its use for the study of the theory of accounting will also

contribute to its improvement, but can in no way lead to a fundamental change. Institutions in this area are mainly interpreted as restrictions, rules, norms, frameworks, and mechanisms of coercion in the economy (North 1981; 2000; Williamson 1996).

Therefore, it is quite logical for Zhuk (2009) to justify its influence, and it was concluded that there is an institutional theory of accounting. Zhuk defined the purpose of such a theory, along with its essence, role, and significance (Zhuk 2009).

Without going into the details of these issues, we note that the validity of the existence of such a theory is confirmed not only by modern accounting practices (international accounting standards and relevant international institutions, etc.). Evidence of the existence of this theory can be carried out even by applying the well-known theory of falsification of Popper (1959). In its context, if we take the hypothesis that there is no institutional basis for accounting, we deprive it of the fundamental basis of existence in general, which is absolutely false.

On the other hand, it is necessary to evaluate the adaptation of each specific object of scientific research (in our case, the accounting system and its theory) for the correct and effective application of the postulates of a particular theory in the process of researching any problem.

3. Methodology

This article uses empirical analysis for the assessment of the feasibility of applying a specific scientific concept formalized in accordance with reasonable criteria. This involves: grouping based on the presence of common features; analyzing the principles of compliance with the principles of the concept of accounting; and empirical assessment of the impact of the concept on the methodology of accounting through predicting the negative consequences of its application.

4. Results

The determination of the possible influence of each of the existing theories of the development of scientific knowledge on a particular branch of science requires an assessment of the effectiveness of the use of concepts. To formalize a model for such an assessment, one should: firstly, group the existing concepts, taking into account their compatibility and the possibility of integration; secondly, identify the shortcomings of the application of the principles of scientific change in the context of the object of study.

The conclusion regarding the effectiveness of the use of scientific concepts in the latter is based on the results of the evaluation, which will have a specific mathematical expression. By excluding from the list of concepts those that will not be effective, it is possible to establish the optimal list of areas of scientific change for a particular field of study.

The study identified the shortcomings of the application of basic concepts for the development of accounting fundamentals in budgetary institutions, and concluded that its basis should be based only on the effective parameters of each of them. To do this, they must be classified.

The implementation of the classification of concepts of scientific change allows for the identification of the relationship between existing authors' positions and the establishing of the relationship between their parameters. In the future, the result of the classification can be the basis for the formation of a formalized mathematical model for their assessment. To do this, it is important to characterize the main shortcomings of the concepts of change in accounting theory, since the latter should be used as the basis for establishing weights for each theory (Fig. 1).

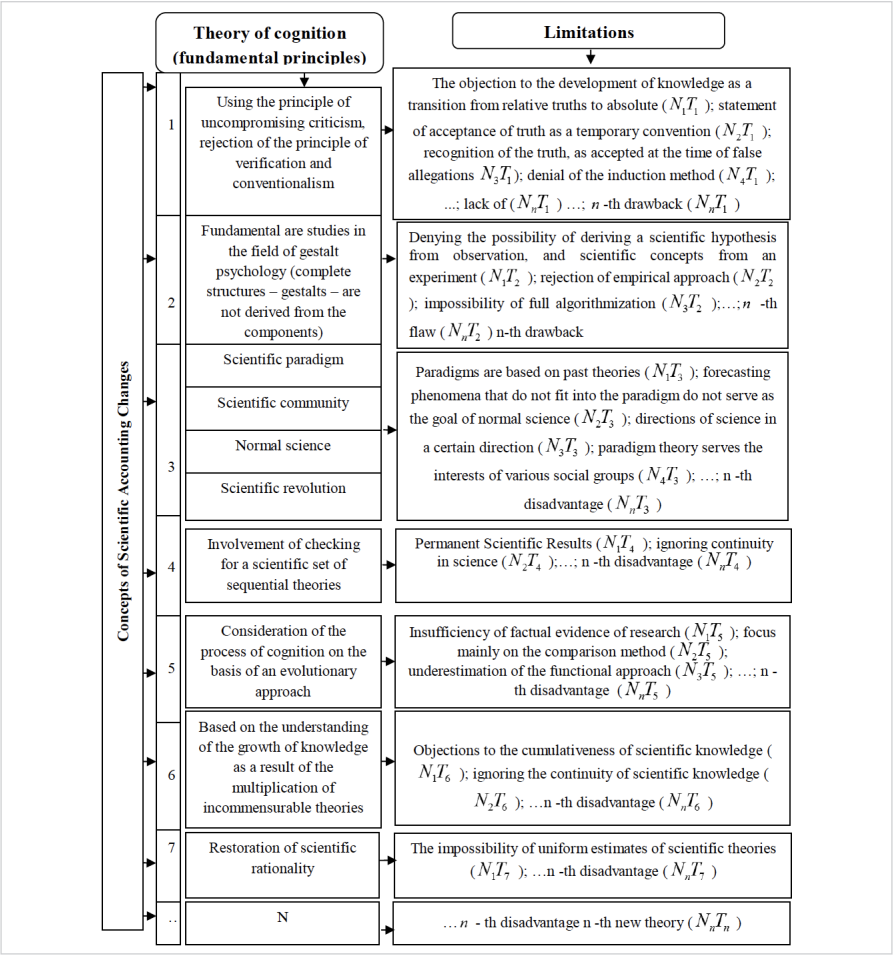

Figure 1. *Classification of concepts and basic principles of scientific accounting changes* *

*Notes: * formed on the basis of [1; 2; 3; 4; 7; 8; 13]; 1 – the theory of fraud; 2 – the concept of implicit personal knowledge; 3 – paradigm theory; 4 – the concept of research programs; 5 – evolutionary concept; 6 – the concept of "epistemological anarchism"; 7 – the concept of research traditions.*

The concepts considered and illustrated (Fig. 1), like any other, are not without drawbacks. However, each of them in a certain way played (and plays) its role in the knowledge of the essence of various phenomena and processes, including those related to accounting. A formalized mathematical model for evaluating the effectiveness of the functioning of the concepts of scientific changes in accounting can be produced as follows:

$$\begin{cases} K_{ef} = \alpha_1 P_{tf} + \alpha_2 P_{ipk} + \alpha_3 P_{pt} + \alpha_4 P_{rp} + \alpha_5 P_{ea} + \alpha_6 P_{cea} + \alpha_7 P_{rt} + \ldots + \alpha_n P_n \\ \sum_{i=1}^{n} \alpha_i = 1 \\ P_{tf} = \langle C_{puc}, C_{fhnk} \rangle; P_{ipk} = \langle C_{fgp} \rangle; P_{pt} = \langle C_{sp}, C_{sc}, C_{ns}, C_{sr} \rangle; P_{rp} = \langle C_{snsct} \rangle; \\ P_{ea} = \langle C_{kbea} \rangle; P_{cea} = \langle C_{ea} \rangle; P_{rt} = \langle C_{rsr} \rangle; P_n = \langle C_n \rangle \end{cases} \quad (1)$$

Where:

P_{tf}– the concept based on the theory of fraud. The main component is the principle of uncompromising criticism C_{puc} and the fundamental hypothetical nature of knowledge C_{fhnk};

P_{ipk}– the concept of implicit personal knowledge. The development of the concept is based (C_{fgp}) on research in the field of Gestalt psychology. It is assumed that the content of scientific statements depends on the implicit context of hidden knowledge, "knowledge as," which is fundamentally of an instrumental nature;

P_{tp}– concept based on paradigm theory. This theory is built on four main elements: the scientific paradigm C_{sp} , the scientific community C_{sc} , normal science C_{ns} , and the scientific revolution C_{sr} ;

P_{rp} – the concept of research programs, which provides for the verification of the scientific nature of a set of consistent theories C_{snsct};

P_{ea} – the evolutionary concept, which provides for consideration of the process of knowledge on the basis of the evolutionary approach C_{kbea};

P_{cea} – the concept of "epistemological anarchism," which provides for consideration of the process of knowledge on the basis of the evolutionary approach C_{ea};

P_{rt} – the concept of research traditions, which provides for the restoration of scientific rationality C_{rsr};

Π_n – n-on concept. It provides C_n, that is, the characteristic that underlies the concept;

α_i – weights that determine the degree of influence of each of the concepts on the resulting value of efficiency. Determined on the basis of taking into account the shortcomings of each of the concepts:

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i \,, \quad (2)$$

where $N_i T_i = 0.1$

Assigning a value of 0.1 to each deficiency corresponds to the condition that their reasonable maximum amount can be 10. If the concept has more flaws, then it is inef-

ficient, and its application will have a negative effect on changing the concept of accounting development.

We can then outline the evaluation devices:

1. Theory of Falsification:

Limitations:

1. 1the denial of the development of knowledge as a transition from relative truths to absolute (N_1T_1).This has a negative effect on the development of the methodology and organization of accounting, since it limits the use of relative estimates. From the point of view of the dynamism of accounting data and its dependence, in modern conditions, on a number of factors that are taken into account through indexation and an additional evaluation, this shortcoming limits the development of the theory of accounting in the evaluation of its objects.
2. the statement regarding the acceptance of truth as a temporary convention (N_2T_1).
   a) contradicts the principle of continuity. Chronologism and consistency inherent in accounting position it as a system of continuous reflection of business operations (with minor fluctuations depending on the requirements of current legislation). The application of the concept under study would indicate the opposite;
   b) accuracy as the main requirement for accounting information cannot be temporary;
3. recognition of the truth, as taken at the time of false allegations (N_3T_1).
   a) contradicts the principle of consistency.
   b) the unacceptability of this concept through the indicated deficiency in the development of accounting theory is obvious, since the accounting system reflects the results of the business operations and processes carried out in the prescribed manner. Reporting as the final stage of accounting should contain accurate, objective data and indicators. Otherwise, it can be recognized as twisted and untruthful, for which responsible employees can be brought not only to administrative, but also to criminal liability.
4. negation of the induction method (N_4T_1).
   a) inductive research method allows for the prediction of the possible options for the development of accounting theory;
   b) taking into account existing trends contributes to more accurate forecasts;
   c) the negation of the method of induction actually deprives the research of the basic output bases.
5. naive refutation.
   a) the refutation of the basis of accounting is impossible due to the presence of mathematical sequences in the implementation of accounting operations;
   b) the rejection of accounting as such contradicts the logic of the needs of society and the individual and the availability of information about the objects;
   c) it is impossible to prove the expediency of not accounting.

Summary: As a result of evaluating the characteristics and principles of the theory of falsification, 12 flaws were identified.

The theory of falsification could probably be applied to such principles as accounting principles and functions (2 positions).

From here:

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i = 1 - (0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1) = 1 - 1.2 = -0.2$$

$$\mathrm{K}_{ef} = \sum_{i=1}^{10} (1 + 1) \cdot (-0.2) = -0.4$$

Conclusion: The theory of fraud is unsuitable for use in research problems of the theory of accounting.

2. The concept of implicit personal knowledge.

Limitations:

1. Denial of the possibility of deriving a scientific hypothesis from observation. The definition of accounting includes the period of observation (observation, measurement, registration, etc.). Its exclusion from the research process will lead to an unjustified limitation of the components of accounting.
2. Denial of the possibility of deriving scientific concepts from experiment.
   a) an experiment in the study of accounting objects is an important research method. Its use allows one to test the developed proposals. The exclusion of experiment will relieve the theory of the possibility of the practical confirmation of new concepts;
   b) denial of testing the results of the study;
3. Rejection of the empirical approach.
   a) refusal to generalize in research. This is unacceptable for accounting, since it makes it impossible to take into account positive experience;
   b) rejection of classification in research. Classification in accounting is one of the main components of its rationalization.
4. The emphasis on implicit knowledge is contrary to the accuracy of accounting, it is its key characteristic.
5. Intuition as the basis of the cognitive process does not correspond to the principle of accuracy of accounting.
6. The thesis that the skill of cognition cannot be described contradicts such a key characteristic of accounting as registration.
7. The presence of fundamental differences between implicit knowledge and current accounting practices.
8. Implicit knowledge is difficult to record because it is in a non-verbal form.
9. The impossibility of a text or other representation.

Generalization: As a result of evaluating the characteristics and principles of the concept of implicit personal knowledge, 8 shortcomings were identified.

This probability theory could be applied to develop the fundamentals of improving reporting, inventory and other accounting methods (3 items)

From here:

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i = 1 - (0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1) = 1 - 1.1 = -0.1$$

$$K_{ef} = \sum_{i=1}^{10} (1 + 1 + 1) \cdot (-0.1) = -0.3$$

Summary: As a result of evaluating the characteristics and principles of the concept of implicit personal knowledge, 8 deficiencies were identified.

This probability theory could be applied to the development of the fundamentals of improved reporting, inventory, and other accounting methods (3 positions).

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i = 1 - (0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1) = 1 - 1.1 = -0.1$$

$$K_{ef} = \sum_{i=1}^{10} (1 + 1 + 1) \cdot (-0.1) = -0.3$$

Conclusion: The theory of implicit personal knowledge is unsuitable for use in researching the problems of accounting theory.

3. Paradigm theory.

Disadvantages:

1. Denial of the new foundations and methods of research:
   a) prediction of phenomena that do not fit into the paradigm do not serve as the goal of the study and are not taken into account when using this concept;
   b) the limited use of innovative research approaches and techniques that do not fit into the existing paradigm.
2. Conclusions and the development of new principles are based only on past theories:
   a) rejection of the new foundations of the development of theory;
   b) the denial of the possibility of using the concept to study the new foundations of theoretical accounting knowledge;
3. The trajectory of science in one particular direction.
4. Limited interests:
   a) serving the interests of specific social groups;
   b) ignoring various interests.

Summary: As a result of evaluating the characteristics and principles of the concept of implicit personal knowledge, 7 shortcomings were identified.

This probability theory could be applied to the development of the accounting methodology as a whole (1 position)

From here:

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i = 1 - (0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1) = 1 - 0.7 = 0.3$$

$$K_{ef} = \sum_{i=1}^{10} 1 \cdot 0.3 = 0.3$$

Conclusion: paradigmatic theory is suitable for use in the study of accounting theory.

4. The concept of research programs.

Disadvantages:

1. 1. Permanence of scientific results does not meet:
   a) the principle of continuity in accounting;
   b) chronology of records;
   c) the initial conceptual basis of accounting – balance sheet equality;
   d) systematic accounting;
   e) historical and logical method of cognition.
2. 2. Ignoring continuity violates:
   a) the principle of historical value;
   b) the principle of continuity of accounting;
   c) the requirement of continuous reflection of the objects of accounting in chronological order;
   d) logical and historical method of scientific knowledge.

Summary: As a result of the evaluation of the characteristics and principles of the concept of research programs, 9 shortcomings were identified.

This theory of probability could be applied to the study of the problems of accounting for liabilities and expenses, as well as the formation of estimates and reporting (4 positions).

From here:

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i = 1 - (0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1) = 1 - 0.9 = 0.1$$

$$K_{ef} = \sum_{i=1}^{10} (1 + 1 + 1 + 1) \cdot 0.1 = 0.4$$

Conclusion: The concept of research programs is suitable for use in researching the problems of accounting theory.

5. The evolutionist concept.

Limitations:

1. The insufficient level of use of factual evidence does not correspond to:

a) the principle of accounting efficiency;

b) the purpose of accounting;

c) documentation as an accounting method.

2. Underestimation of the functional approach:

a) leads to the loss of real opportunities to influence future results due to insufficient use of credentials by the management system;

b) contradicts the separation of accounting by sites and objects and the subsequent construction of accounting indicators;

c) does not allow for the full combination of the functions of accounting.

3. The emphasis is mainly on the comparison method:

a) not all cases of comparison in accounting give a real picture of the state of the subject;

b) the indifference of various accounting objects limits the application of the concept.

Summary: As a result of evaluating the characteristics and principles of the evolutionist concept, 8 shortcomings were identified.

This probability theory could be applied to the study of asset and liability accounting and reporting problems (3 items)

From here:

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i = 1 - (0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1) = 1 - 0.8 = 0.2$$

$$K_{ef} = \sum_{i=1}^{10} (1 + 1 + 1) \cdot 0.2 = 0.6$$

Conclusion: The evolutionist concept is suitable for use in researching the problems of accounting theory.

6. The concept of "epistemological anarchism."

Limitations:

1. 1. Denial of the cumulativeness of scientific knowledge does not respond:
   a) the basic concept of accounting, built on balance sheet equality;
   b) a certain isolation of the accounting system within a particular subject of activity, as well as the limitations of this theory based on a number of requirements;
   c) consideration of the development of the science of accounting as a progressive process (albeit with a bearish amplitude)
2. Accidents in accounting studies play an insignificant role in comparison with other sciences.
3. Ignoring the continuity of scientific knowledge:

a) limits the use of a systematic research method;
b) denies the historical and logical methods of scientific knowledge;

Summary: As a result of evaluating the characteristics and principles of the evolutionist concept, 6 shortcomings were identified.

This probability theory could be applied to the general accounting methodology (1 position).

From here:

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i = 1 - (0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1) = 1 - 0.6 = 0.4$$

$$K_{ef} = \sum_{i=1}^{10} 1 \cdot 0.4 = 0.4$$

Conclusion: The concept of epistemological anarchism is suitable for use in the study of problems of accounting theory.

7. The concept of research traditions.

Limitations:

1. The position that no experiment is key or sufficient to refute the developed theory.
2. The basis (core) of the study should be the same for different objects.
3. The research program may be progressive or regressive, which excludes those studies that have an ascertaining character.
4. The obligation to consider phenomena and processes that do not fit into the existing paradigm. The inclusion of all such phenomena, without assessing their impact, leads to excessive detail, but not always positive outcomes for the development of the science of accounting.
5. Unconventional approaches to scientific views are the basis for the development of new concepts (contrary to the principles of historical assessment, accuracy, prudence, and some other accounting principles).
6. The objection of unified assessments of scientific theories.

Summary: As a result of evaluating the characteristics and principles of the evolutionist concept, 6 shortcomings were identified.

This probability theory could be applied to the general accounting methodology (1 position)

From here:

$$\alpha_i = 1 - \sum_{i=1}^{10} N_i T_i = 1 - (0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1) = 1 - 0.6 = 0.4$$

$$K_{ef} = \sum_{i=1}^{10} 1 \cdot 0.4 = 0.4$$

Conclusion: The concept of research traditions is suitable for application in the research of problems of accounting theory.

8. Institutional theory.

Limitations:

1. Contrasts with classical and neoclassical views, which in modern conditions continue to be relevant and determine the fundamental basis of accounting (a static approach corresponding to the formation of a balance sheet as a reporting form; abstract analysis method, etc.).
2. The legal framework as the basic framework (in economics and accounting, the legal framework is important, but not the only influential framework for the development of economic phenomena and processes).
3. The emphasis on the need for greater public control over business and government intervention in the economy (contrary to the widespread use of market laws for economic development).

Summary: As a result of assessing the characteristics and principles of the institutional concept, 3 shortcomings were identified.

In our opinion, this theory could be applied to the general accounting methodology (1 position)

From here:

$$\alpha_{i=}1-\sum_{i=1}^{10} N_i T_i = 1-(0.1+0.1+0.1) = 1-0.3 = 0.7$$

$$\mathrm{K}_{ef} = \sum_{i=1}^{10} 1 \cdot 0.7 = 0.7$$

Conclusion: Institutional theory (concept) is suitable for use in the study of problems of accounting theory.

An evaluation model has been developed that makes it possible to make the right choice of an initial research concept, as its final result and effectiveness depend on it. A well-grounded approach to assessing output research concepts is based on the mathematical justification of the appropriateness of their application for the development of the theoretical foundations of accounting. The assessment developed is based on the empirical determination of the shortcomings of the research concept regarding the possibilities of satisfying the tasks that are posed before. In the future, the development of scientific research in this direction should be directed towards the identification and justification of new laws for the formation of an effective modernized accounting system. This will make it possible to comprehensively solve the important problem of the development of accounting theory.

5. Conclusions

In general, the theories considered have a number of shortcomings in the accounting system; however, some of them can be used quite effectively when developing the theory of accounting. In particular, as a result of the assessment of scientific concepts in accordance with justified criteria and the proposed mathematical model, it was found that it is most advisable to use institutional (K_{ef} = 0.7) and paradigm (K_{ef} = 0.3) theory, the concept of "epistemological anarchism" (K_{ef} = 0.4), and the concept of research programs (K_{ef} = 0.4).

These concepts have minor flaws associated with the inconsistency of their principles with the essential characteristics and the accounting paradigm. Accordingly, the risk of obtaining false results from studies of accounting problems is minimal when using them.

References

1. DIPIAZA, S. and R. JEKKLZ. *Budushhee korporativnoj otchetnosti. Kak vernut' doverie obshhestva* [The future of corporate reporting. How to restore public confidence]. Moscow: Al'pina Publisher, 2003.
2. FEYERABEND, P. *Against Method*. London: Verso, 1993.
3. HARTLEY, R.V.L. Transmission of information. *The Bell System Technical Journal*. 1928, **7**, 535–563.
4. HOLOV, S.F. Teoriia bahatotsilovoho bukhhalterskoho obliku [Theory of multipurpose record-keeping]. *Bukhhalterskyi oblik i audit*. 2011, **4**, 3–13.
5. KABIR, H. Positive Accounting Theory and Science. *Journal of CENTRUM Cathedra*. 2010, **3**(2), 136–149. Available from: https://www.researchgate.net/publication/228118770_Positive_Accounting_Theory_and_Science
6. KAYA, İ. Accounting Choices in Corporate Financial Reporting: A Literature Review of Positive Accounting Theory. In: S. GOKTEN, ed. *Accounting and Corporate Reporting – Today and Tomorrow*. IntechOpen, 2017. ISBN: 978-953-51-3550-0. Available from: https://doi.org/10.5772/intechopen.68962
7. KHORUNZHAK N., N. SEMENYSHENA, O. ADAMYK, I. SADOVSKA, K. NAHIRSKA, and V. ZHUK. The methodology for calculating baseline indicators for budgeting expenditures of budgetary institutions: the case of Ukraine. *Intellectual Economics*. 2019, **13**(1), 40–45. Available from: https://doi.org/10.13165/IE-19-13-1-04
8. KUN, T. *Struktura nauchnyh revoljucij. Normal'naja nauka i opasnosti, svjazannye s nej. Otvet na kritiku*. Translated into Russian by I.Z. NALETOV et al. Moscow: AST, 2002.
9. KUTER, M.I. *Teorija i principy buhgalterskogo ucheta* [Theory and Principles of Accounting]. Moscow: Finansy i statistika, jekspert bjuro, 2000.
10. LAKATOS, I. *Fal'sifikacija i metodologija nauchno-issledovatel'skih programm. Istorija nauki i ee racional'nye rekonstrukcii* (Iz avtorskogo sbornika: Izbrannye proizvedenija po filosofii i metodologii nauki). Translated by A. NIKIFOROV. Moscow: Akademicheskij Projekt, 2008. ISBN 978-5-902358-48-0.

11. LEHENCHUK, S.F. *Teoriia i metodolohiia bukhhalterskoho obliku v umovakh postindustrialnoi ekonomiky* [Theory and methodology of accounting in a post-industrial economy]. Zhytomyr: ZhDTU, 2010.
12. LEHENCHUK, S.F. Rozvytok bukhhalterskoho obliku na osnovi kontseptsii metodolohichnoho anarkhizmu P. Feiierabenda: Pro et Contra [Development of accounting based on the concept of methodological anarchism by P. Feyerabend: pro et contra]. *Ekonomika: realii chasu*. 2012, **2**(3), 88–91. Available from: http://economics.opu.ua/files/archive/2012/No2/88-91.pdf
13. LEYERER, C. *Theorie der Geschichte der Buchhaltung* [Theory of the history of accounting]. Brunn: Trill, 1919. Available form: http://www.buchen.ch/Geschichte_der_doppelten_Buchhaltung.pdf
14. MALYUGA, N.M. *Kontseptsiia rozvytku bukhhalterskoho obliku v Ukraini: teoretyko-metodolohichni osnovy* [The concept of accounting development in Ukraine: theoretical and methodological bases]. Zhytomyr: ZhDTU, 2006.
15. NORTH D. *Institutions, institutional change and the functioning of the economy*. Moscow: Osnovy, 2000.
16. POLANI, M. *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago: The University of Chicago Press, 1958.
17. POPPER, K. *The logic of scientific discovery*. London: Hutchinston, 1958.
18. POPPER, K. *Logika i rost nauchnogo znanija. Izbrannye raboty* [Logic and the growth of scientific knowledge. Selected works]. Translated from English to Russian. Moscow: Progress, 1983.
19. SEMENYSHENA, N. Problems of Accounting Reform in Ukraine: Institutional Aspects. In: *The 12th Doctoral Conference of Faculty of Finance and Accounting at University of Economics (27th May 2011), Prague: Collection of Papers*, Volume 1. 2011, pp. 277–281.
20. SOKOLOV, Ja. V. *Osnovy teorii buhgalterskogo ucheta.* Moscow: FiS, 2000.
21. TAKEDA, R. *Institutional Accounting Theory.* Tokyo: Chuoukeizai-Sha Inc., 1982.
22. UNEGBU, A.O. Theories of Accounting: Evolution & Developments, Income Determination and Diversities in Use. *Research Journal of Finance and Accounting*. 2014, **5**(19), 1–15. Available from https://arxiv.org/ftp/arxiv/papers/1411/1411.4633.pdf
23. WEBER, M. *Wirtschaft und Gesellschaft, Herrschaft* [Economy and Society: Rule]. Edited by Karl Ludwig Ay, Ursula Bude and Edits Hanke. München: Mohr Siebeck, 2005.
24. WATTS, R.L. and J.L. ZIMMERMAN. *Positive Accounting Theory*. Englewood Cliffs: Prentice Hall, Inc., 1986.
25. WILLIAMSON, O. *Economic institutions of capitalism. Firms, markets, "relational" contracting*. Translated from English to Russian. St. Petersburg: Lenizdat, 1996.
26. ZHUK, V.N. *The concept of the development of accounting in the agricultural sector of the economy: a monograph*. Moscow: NSC IAE, 2009.