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Article

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**ETHICS AND INTEGRITY IN THE CONTEXT OF ECONOMIC RESEARCH
WITHIN DOCTORAL SCHOOLS**

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Abstract

Nationally and internationally, there is an upward trend in terms of ethics and integrity in scientific research. Yet, there are many opinions, both in academia and in society, about the many cases of violations of ethical principles in research. This requires today more than ever that the observance of ethics in research to become an increasingly important and relevant desideratum in the contemporary society. Failure to achieve this requirement can generate serious consequences on university education, especially in the long term, materialized by a series of consequences such as: the decrease in the quality of academic activity; devaluation of the status of university professors; undervaluation of scientific research; underappreciation of doctoral studies; lack of respect at the level of the society. Therefore, the members of the academic community – students, master students, PhD students and professors – must become increasingly aware of the social effects of noncompliance with the principles of ethics and integrity in scientific research.

The purpose of this research is aimed at evaluating the perception of PhD students and doctoral supervisors on the observance of the principles of ethics in the research activity within the doctoral schools in economic sciences, as well as the identification of the most important factors with significant influence on ethics and integrity in research. In this regard, the authors of the present paper have carried out quantitative research among the two target groups within the doctoral schools of economic sciences affiliated with the Universitaria Consortium in Romania, respectively, PhD students and doctoral supervisors. The data collected from the 455 respondents (169 PhD supervisors and 286 PhD students) were analyzed using structural equation modeling in SmartPLS. The conceptual model proposed by the authors reveals that the observance of ethics in scientific research is based on professionalism, honesty, academic freedom, integrity, ethical behavior, and the avoidance of violation of ethical principles.

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The originality of the paper consists in the realization of structural models that highlight the most influential factors in the observance of ethics and integrity in economic research, but also of the relations between them, as well as the differences and similarities between PhD students and doctoral supervisors regarding their perception of ethics and integrity in research. By knowing these factors, academic programs can be initiated that will lead to a higher level of academic integrity in doctoral schools and better results in observing the ethics in scientific research, but also in the training of future researchers in the field of economic sciences.

Keywords: ethics and integrity in research, professionalism, honesty, academic freedom, academic integrity, ethical behavior, structural equations, Universitaria Consortium.

Clasificare JEL: C52, C59, I21, I23, J24, J28.

Introduction

Ethics and integrity represent a set of principles and rules that serve as fundamental values based on which scientific research is carried out (Socaciu and Mihailov, 2018). The term *ethics* comes from the Greek word *ethos*, which translates as “the way or manner of being” (Găină, 2020, p.12). The field of ethics involves a systematization of the concepts of correct behavior, as well as their defense, with the aim of discovering and introducing the principles by which human character and action can be judged (Găină, 2020). It can be an abstract or applied research. The one to which the present work refers is an applied one, namely **the ethics of scientific research** that discusses the ethical problems that arise in all phases of a research, from choosing the topic and the methods to its actual development and then to the publication and deployment of the results (Socaciu, 2017). This type of ethics is ensured by complying with a set of principles, rules, rights, and values (professionalism, honesty, academic freedom, academic integrity, ethical behavior) intended to influence the conduct of researchers and make them responsible, respectively, protecting the citizens of possible harmful effects of the research.

Integrity represents the virtue of a person or an organization (Socaciu, 2017) and, as such, is the subject of the study of ethics. Integrity refers to internalization of ethical norms by researchers, teachers, students, and their ownership by academic organizations (Peters et al., 2022). Integrity in scientific research is ensured by complying with some fundamental values (honesty, accountability, verifiability, and validity of knowledge) that both researchers and research institutions must satisfy through principles, practices, and knowledge products (Lăzăroiu, 2019).

In order for the scientific research to be ethically acceptable and its decisions credible, the research behavior must be in accordance with good scientific practice: to follow courses of action approved by the scientific community, i.e., integrity, meticulousness, and accuracy in research conduct and presentation of results, as well as in judging the research and its results (Găină, 2020); to ethically use collections of data gathered with respect to research ethics, research and evaluation methods in accordance with scientific criteria, and to practice an openness to scientific knowledge in the publication of results; to consider the work and achievements of other researchers, respecting their involvement and giving due credit and weight to their achievements in carrying out their own research and publishing the results (Găină, 2020).

The aim of this paper is to precisely see how the fundamental values of ethics and integrity in research activity are perceived by doctoral supervisors and doctoral students from doctoral schools in the economic field, as well as to bring to the fore of the factors with significant influence in this endeavor.

To achieve this goal, the paper is logically structured, reviewing specific aspects regarding ethics and integrity in scientific research and the formulation of working hypotheses (Introduction and Literature review), followed by considerations regarding the sample used, establishing the research model, evaluating measurement models and structural models (methodology), then moving on to highlighting the results obtained and discussions on their side (Results and discussions), and finally making assessments regarding the importance of the topic, limits, and future opportunities (Conclusions).

1. Literature review and hypotheses formulation

One of the fundamental responsibilities of universities is to train their students in the spirit of the ethical principles and norms of the profession (Rissanen and Löfström, 2014), because training in the spirit of ethical values will determine students to become more of integrity and more socially aware (Delgado-Aleman et al., 2020), but also more open to reflection on the problems and moral dilemmas they will encounter in their professions (Arsith, 2010). Academic freedom divorced from ethical accountability hampers the institutional sustainability of the university (Jora et al., 2020). The training offered by universities to future professionals is intended to contribute to the understanding of professional ethics and deontology (Miotto et al., 2020). Of course, higher education institutions must be perceived as a framework for learning and awareness of the principles of ethics and integrity in the context of scientific research (Rissanen and Löfström, 2014).

The adoption of ethical conduct by researchers is the quintessence of scientific research activities (Löfström and Pyhältö, 2014). Most students learn the guidelines and principles of ethical conduct from their supervisors and from their more experienced colleagues in scientific research (Alfredo and Hart, 2011). Therefore, their ethical behavior becomes to a large extent the consequence, respectively, of the different types of guidance received during their studies (Löfström and Pyhältö, 2017).

Professionalism in science denotes a pattern of behavior associated with scientific integrity. Therefore, scientists are expected to demonstrate intellectual honesty and excellence in their thinking and work (Korenman, 2006). The attributes of professionalism, frequently highlighted, are, among others, the possession of specialized knowledge in a certain field, professional competence, and proof of honesty, integrity, and responsibility (Romme, 2016). At the same time, integrity embodies a researcher's respect for intellectual honesty and personal responsibility (Ofori, 2021). In the light of these considerations, we hypothesize:

H₁. Professionalism exerts a positive influence on the intellectual honesty of doctoral students (**H_{1a}**), respectively, of doctoral supervisors (**H_{1b}**).

An uncompliant behavior in the practice of academic research involves the fabrication and falsification of data and results, the plagiarism of ideas and/or words, as well as negligence and/or deliberate errors in conducting research (Muhsin et al., 2017; Yeo-Teh and Tang, 2020; CEAR, 2022). Referring to these deviations that violate academic integrity, Fatemi and Saito (2020) group them into four categories, namely plagiarism, collusion defined as

an unauthorized collaboration with another person, cheating, and research misconduct. Thus, educational and research institutions, but also researchers (Cutri et al., 2021) are increasingly turning to the use of various tools for checking the level of academic integrity, such as programs that identify the degree of similarity of a text with everything that already exists in the databases (Turnitin, plagiarism finder, etc.). Of course, in addition, various means of monitoring students can be used, for example, through online surveillance practices (Dawson, 2021).

In practice, it is important for the researcher to be aware of the risks of violating ethical norms. That is why PhD students and young researchers must be trained on how to responsibly access databases, but especially on how to cite and reference the ideas expressed by others in a manuscript (Lăzăroiu, 2022). Of course, the current legislation on copyright, intellectual property and the requirements related to the correct citation of the sources used must also be taken into account (Jung, 2009; Dinu et al., 2017). With the help of ethics policies, universities must take appropriate measures to combat plagiarism, thus improving the value of the research carried out and discouraging academic dishonesty (fraud) (Sutar, 2017; Abbas et al., 2021). In order to support a good understanding of the skills related to “academic literacy” (Cutri et al., 2021, p.9), universities should resort more often to organizing training courses on topics related to ethics and academic integrity, avoiding plagiarism, and professional ethics. Therefore, through all the actions they undertake, universities must create an environment that promotes and supports excellence (Masic, 2012). An important role in the process of avoiding the violation of ethical principles and values also belongs to the teaching staff, the professor (the supervisor of the doctoral thesis), who, on the one hand, has the task of sharing his knowledge in the field of scientific research with the students (González et al., 2019), and on the other hand, to succeed in shaping the PhD students correctly in the spirit of academic integrity (Strangfeld, 2019; Cutri et al., 2021).

In his study on the ethical behavior of students, Yang (2012) found that compared to undergraduate students, doctoral students perceived plagiarism and falsification of ideas as highly unethical practices. The explanation may lie in the fact that doctoral students have a more solid academic preparation and are much more aware of the difficulties associated with plagiarism and other forms of academic fraud. Therefore, they are less prone to such deviations. Academic fraud (academic dishonesty) described as a form of manifestation of the lack of academic honesty can bring “benefits” to students by reducing the time they use to write a scientific material, respectively, the diminution of the intellectual effort required by the scientific research activity (Hendricks, 2004). If the importance of rigor in scientific research is not understood (Lăzăroiu, 2017), then taking some ideas without citing them and displaying unethical behavior will not be perceived as a violation of honesty in scientific research (Mushin et al., 2017).

H₂: Avoiding the violation of ethical principles determines the honesty of the doctoral researcher (H_{2a}), respectively, of the doctoral supervisors (H_{2b})

H₃: Avoiding the violation of ethical principles influences the ethical behavior of doctoral researchers (H_{3a}), respectively, of doctoral supervisors (H_{3b})

A society needs professors not only for their expertise in a certain field, but also for the training of future researchers regarding the approach of a research, thus demonstrating their devotion to knowledge and truth (Anderson and Loius, 1994). Alajami (2021) assesses the fact that there is

a set of values such as honesty, trust, fairness, and responsibility that determine the ethical behavior of the researcher. Once applied, they contribute to the compliance with ethics in research. Avoiding all deviations or unethical and questionable practices is considered as an honest and responsible conduct of a research (Yeo-Teh and Tang, 2020).

H₄: The ethical behavior of researchers influences the honesty of the doctoral researcher (H_{4a}), respectively, of the doctoral supervisors (H_{4b})

H₅: The ethical behavior of researchers determines the compliance with ethics in the research of doctoral students (H_{5a}), respectively, of doctoral supervisors (H_{5b})

As researchers, both professors and students must assume different ethical responsibilities such as honesty in collecting and analyzing data or protecting subjects participating in research (Hunag et al., 2021). Verschuren (2016) lists the three pillars on which academic honesty rests: research openness/transparency, truthfulness, and fairness. A responsible and honest approach to research provides precision and ensures the credibility of the results (Hyytinen and Löfström, 2017). The lack of academic honesty has the consequence of depriving the scientific content of part of its value (Alajami, 2021).

H₆: Honesty has a positive impact on the compliance with research ethics of doctoral students (H_{6a}), respectively, of doctoral supervisors (H_{6b})

Academic freedom is a core principle of universities (Aarrevaara, 2010). It offers and defends the right of every member of the academic community to research (Hogan and Trotter, 2013), to publish without external influences and interference (Gibbs, 2016), to think freely and express their ideas (Al Hila et al., 2017), offering autonomy to the researcher, respectively, supporting and protecting the act of teaching and scientific research (Pringle and Woodman, 2022). Of course, academic freedom also implies the idea of responsibility in conducting scientific research (Al-Ghareb, 2015).

H₇: Academic freedom generates the ethical behavior of doctoral researchers (H_{7a}), respectively, of doctoral supervisors (H_{7b})

H₈: Academic freedom determines the compliance with research ethics of doctoral students (H_{8a}), respectively, of doctoral supervisors (H_{8b})

Academic integrity is based on the ethical behavior of the members of a university community, creating a culture of academic honesty and intellectual rigor (Mureşan and Constantinescu, 2018). Academic integrity calls for the acceptance and compliance with ethical principles and values by students and professors, such as, for example, academic freedom, moral integrity, collegiality, transparency, academic conduct, etc. (Popa and Ristea, 2020; Cojocariu and Mareş, 2022), but also combating those actions that can jeopardise it.

In the spirit of academic integrity, students and professors comply with the rules and norms of the university and ensure that their colleagues also take them into account (Jones, 2011). By ensuring compliance with these values and professional standards, inappropriate behavior in research can be avoided. Studying academic integrity, Löfström et al. (201) and Krizanova et al. (2019) suggest that professors (supervisors, doctoral supervisors) have different points of view regarding this concept and take into account aspects such as: the way in which academic integrity can be learned and taught; the extent to which the teaching of academic integrity is explicit or if it is modeled on a certain behavior; the way of mirroring academic integrity in research, etc. The discussion about the importance of

academic integrity and ethics is extended in the context of doctoral supervision, the role of the doctoral supervisor, and Löfström and Pyhältö (2020) appreciate that academic integrity and ethics often intertwine in the moral decision-making.

Within doctoral training, it is the responsibility of the doctoral supervisor to explain what integrity, authenticity, and ethics in research entail and mean (Cutri et al., 2021), thus supporting a culture of academic integrity, which will bring benefits to the members of the academic community, but it will also lead to a strengthening of the reputation of the higher education institution (Richards et al., 2016).

H₉: *Academic integrity exerts a positive influence on the compliance with research ethics of doctoral students (H_{9a}), respectively, of doctoral supervisors (H_{9b})*

Based on these hypotheses and arguments, a research model was created, shown in figure no. 1, which refers to the correlations between the constructs and the hypotheses.

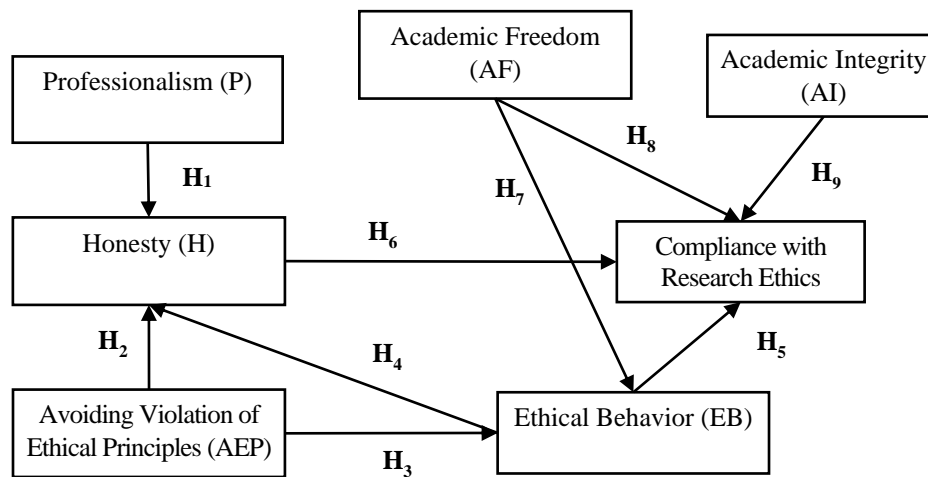


Figure 1. Research model

2. Methodology

2.1. Research methods

In order to evaluate the perception of doctoral students and doctoral supervisors on the compliance with research ethics in the activity of economic research, the authors resorted to the implementation of an empirical research within the Doctoral Schools of Economic Sciences within the framework of the Romanian Universitaria Consortium, which in 2022 has the following members: Bucharest University of Economic Studies (BUES), University of Bucharest (UB), Alexandru Ioan Cuza University of Iași (AICU), Babeș-Bolyai University in Cluj-Napoca (BBU), West University of Timișoara (WUT), Lucian Blaga University of Sibiu (LBUS), University of Craiova (UC), “Dunarea de Jos” University of Galați (DJUG) and Ovidius University of Constanța (OUC) (G4Media, 2022). The University of Bucharest does not have a doctoral school in economics, nor does the Ovidius University of Constanța. Within these universities, it was possible to identify both strictly specialized doctoral schools in one field, such as those of the Bucharest University

of Economics Studies (ASE, 2022), respectively, and interdisciplinary ones in economic sciences, such as the doctoral schools at BBU, WUT, or AICU (UBB, 2022), respectively, the transdisciplinary ones such as the one at DJUG (UDJG, 2022).

The research was quantitative and was based on the survey technique. The data collection instrument was represented by the questionnaire. It was distributed in the period May-August 2022 both via the isondaje.ro platform and via Google Forms to the directors of the doctoral schools of economic sciences of the universities within the Universitaria Consortium, to doctoral supervisors and doctoral students. The statements in the questionnaire were operationalized according to the framework of the specialized literature; see Table no. 2. The respondents had to evaluate the statements on a six-point Likert scale, from total disagreement to total agreement. In total, 286 doctoral students and 169 doctoral supervisors participated in the research. Their breakdown by universities, gender, and doctoral domains is shown in Table no. 1.

Table no. 1: The socio-demographical characteristics of the respondents

	BUES		BBU		UVT		AICU		UC		DJUG		LBUS		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Gender (doctoral students)																
Male	78	273	2	07	5	11	5	6	10	35	3	10	19	66	122	427
Female	103	360	6	21	17	38	17	21	15	52	4	14	19	66	164	573
Total	181	633	8	28	16	56	11	38	25	87	7	24	38	133	286	1000
Doctoral field (doctoral students)																
BA	38	133	-	-	1	03	-	-	-	-	-	-	-	-	39	136
CES	15	52	1	03	-	-	1	03	3	10	-	-	2	07	22	77
A	18	63	-	-	5	17	3	10	6	21	-	-	-	-	32	112
E	33	115	-	-	4	14	-	-	5	17	1	03	5	17	48	168
EIA	25	87	-	-	-	-	1	03	1	03	-	-	-	-	27	94
Finance	10	35	1	03	1	03	-	-	8	28	-	-	7	24	27	94
EI	4	14	-	-	-	-	-	-	-	-	-	-	-	-	4	14
Mgm	31	108	2	07	4	14	2	07	2	07	6	21	24	84	71	248
Mk	7	24	4	14	1	03	4	14	-	-	-	-	-	-	16	56
Total	181	633	8	28	16	56	11	38	25	87	7	24	38	133	286	1000
Study year (doctoral students)																
Year1	27	94	4	14	1	03	3	10	9	31	1	03	10	35	55	192
Year2	39	136	2	07	6	21	1	03	5	17	2	07	4	14	59	206
Year3	58	203	1	03	7	24	3	10	7	24	3	10	10	35	89	311
Year4	18	63	-	-	2	07	3	10	4	14	-	-	8	28	35	122
Year5	39	136	1	03	-	-	1	03	-	-	1	03	6	21	48	168
Total	181	633	8	28	16	56	11	38	25	87	7	24	38	133	286	1000
Gender (doctoral supervisors)																
Male	40	237	6	36	4	24	7	41	7	41	5	30	7	41	76	450
Female	42	249	10	59	9	53	13	77	11	65	2	12	6	36	93	550
Total	82	485	16	95	13	77	20	118	18	107	7	41	13	77	169	1000
Doctoral field (doctoral supervisors)																
BA	17	101	-	-	-	-	-	-	-	-	-	-	-	-	17	101
CES	4	24	4	24	-	-	2	12	2	12	-	-	1	06	13	77
A	20	118	2	12	2	12	3	18	6	36	-	-	-	-	33	195
E	9	53	-	-	4	24	-	-	3	18	3	18	6	36	25	148
EIA	7	41	2	12	-	-	2	12	-	-	-	-	-	-	11	65
Finance	1	06	2	12	-	-	4	24	-	-	1	06	-	-	8	47
EI	3	18	-	-	-	-	-	-	-	-	-	-	-	-	3	18
Mgm	14	83	6	36	5	30	5	30	7	41	2	12	6	36	45	266
Mk	7	41	-	-	2	12	4	24	-	-	1	06	-	-	14	83
Total	82	485	16	95	13	77	20	118	18	107	7	41	13	77	169	1000

	BUES		BBU		UVT		AICU		UC		DJUG		LBUS		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Seniority in doctoral supervision (doctoral supervisors)																
Less than 5 years	37	21.9	7	4.1	7	4.1	7	4.1	4	2.4	4	2.4	6	3.6	72	42.6
6-10 years	7	4.1	2	1.2	3	1.8	1	0.6	7	4.1	3	1.8	2	1.2	25	14.8
11-15 years	12	7.1	2	1.2	2	1.2	5	3.0	2	1.2			3	1.8	26	15.4
16-20 years	10	5.9	1	0.6			5	3.0	2	1.2			1	0.6	19	11.2
21-25 years	11	6.5	2	1.2	1	0.6	1	0.6	2	1.2					17	10.1
over 25 years	5	3.0	2	1.2			1	0.6	1	0.6			1	0.6	10	5.9
Total	82	48.5	16	9.5	13	7.7	20	11.8	18	10.7	7	4.1	13	7.7	169	100.0

Note: BUES - Bucharest University of Economic Studies; BBU - Babeş-Bolyai University in Cluj-Napoca; AICU - Alexandru Ioan Cuza University of Iaşi; WUT - West University of Timişoara; UC - University of Craiova; DJUG - “Dunarea de Jos” University of Galaţi; UB - University of Bucharest and Ovidius University of Constanţa do not have doctoral schools in the field of economics.

Note: BA - Business Administration; CES- Cybernetics and Economic Statistics; A- Accounting; EIA - Economics and International Affairs; EI- Economic Informatics; Mgm - Management; Mk - Marketing.

2.2. Evaluation of the measurement models

The conceptual model shown in Figure No. 1, together with the considered constructs and hypotheses, was analyzed using SmartPLS 3.3.9 (Ringle et al., 2015). The choice of structural equation models was due to the fact that all the constructs of the model in Figure No. 1 were conceptualized (designed) as reflective (Richter et al., 2016; Rigdon et al., 2017). Next, as shown in Table 2, respectively, in Table 3, the validity and internal consistency of all reflective constructs, the item loadings, the average variance extracted, the reliability indicators, and the discriminant validity. As can be seen from Table no. 2 all item loadings exceed the minimum requirement threshold of 0.7 recommended by the literature (Hair et al., 2010), the values varying between 0.709 and 0.944 for the sample of doctoral students, respectively between 0.739 and 0.928 for the sample of supervisors.

Table no. 2. Scale reliability for PhD Students and PhD Supervisors

Item	Measure	Loading PhDs.	Loading Sup.
Professionalism (P) adapted from Liu, 2006; BBU, 2019			
P1	The university adopts measures by which the doctoral school rewards scientific, professional and pedagogical excellence.	0.829	0.856
P2	The university adopts measures by which the doctoral school ensures that a previously conducted research can be resumed only if it leads to new results.	0.795	0.878
P3	The university adopts measures by which the doctoral school supports academic freedom.	0.817	0.825
P4	The university adopts measures by which the doctoral school supports the development of academic programs to high standards.	0.872	0.895
P5	The University adopts measures by which the doctoral school applies ethical standards to researchers.	0.868	0.857
Honesty (H) adapted from Anderson & Louis, 1994; Liu, 2006; Huang et al., 2021			
H1	The researcher obtains the consent of the participants in the conducted research.	0.817	0.797

Item	Measure	Loading PhDs.	Loading Sup.
H2	The researcher thanks everyone who helped him in conducting the research.	0.750	0.739
H3	The researcher knows the research methods very well.	0.732	0.815
H4	The researcher assumes the correctness of the conducted research.	0.875	0.850
H5	The researcher has the right to abandon the research if it is not carried out correctly.	0.740	0.767
H6	The researcher understands the responsibility of their own research.	0.872	0.869
Avoiding Violation of Ethical Principles (AEC) adapted from Liu, 2006; Watts et al., 2020			
AEC1	I know what unethical aspects a researcher in my scientific field should avoid.	0.922	0.922
AEC2	I am able to understand the recommendations of colleagues regarding ethical principles in research.	0.944	0.928
Academic Freedom (AF) adapted from Anderson & Louis, 1994; BBU, 2019			
AF1	I have the right to freely express my scientific opinions.	0.770	0.746
AF2	I contribute through my activity to the expansion of the frontiers of scientific knowledge, for the benefit of society/humanity.	0.709	0.757
AF3	I have complete freedom of thought.	0.869	0.841
AF4	I choose the most suitable methods for the ethical solution of the problems that arise in the research I carry out.	0.771	0.820
AF5	I choose the most appropriate methods myself for the ethical solution of problems arising in relation to colleagues/other researchers.	0.750	0.766
AF6	I am not censored.	0.761	0.870
Academic Integrity (AI) adapted from Anderson and Louis, 1994; BBU, 2019			
AI1	I ensure that data interpretation is carried out according to field-specific procedures.	0.903	0.812
AI2	I ensure that ideas, procedures, methods, etc. from a scientific paper are correctly referenced.	0.914	0,813
AI3	I avoid misinterpretation of collected data.	0.798	0.805
AI4	I avoid research fabrication.	0.839	0.882
AI5	I ensure that everyone who worked on a manuscript submitted for publication is listed as a co-author on it.	0.862	0.807
Ethical Behavior (EC) adapted from Watts et al., 2020			
EC1	I strongly condemn academic fraud.	0.848	0.818
EC2	I am deeply concerned with persuading others to respect ethics in scientific research.	0.741	0.747
EC3	I renounce any co-author who does not respect professional deontology and research ethics.	0.826	0.841
Compliance with Research Ethics (CRE) adapted from Watts et al., 2020			
CRE1	In the course of my research, I respect the rules of conduct of the doctoral school.	0.871	0.824
CRE2	When I carry out research, I do not falsify data.	0.791	0.877
CRE3	I am always careful to correctly cite any idea taken from another author.	0.884	0.880
CRE4	I respect the ethical standards of the institution.	0.901	0.895

Note: PhDs: PhD Students; Sup: PhD Supervisor.

Reliability in the considered constructs was also analyzed using the Cronbach's α coefficient, which must exceed the value of 0.7 for a construct to be acceptable for confirmatory purposes (Henseler and Sarstedt, 2013). All values of the reliability coefficient exceeded the minimum demand threshold of 0.7 for both samples (doctoral students and supervisors), indicating that the model has internal consistency (Table no. 3).

On the other hand, the average variance extracted exceeds the threshold of 0.5, which indicates that the measurement model is adequate (Chin, 1998), with all constructs having convergent validity. As can be seen from Table No. 3, the composite reliability of the constructs (CR) exceeds the considered threshold of 0.7 (Hair et al., 2010).

Table no. 3. Reliability indicators of the model for the two considered samples

Factors	Cronbach's Alpha		Average Variance Extracted		Composite Reliability	
	PhDs	Sup	PhDs	Sup	PhDs	Sup
P	0.893	0.915	0.701	0.744	0.921	0.936
H	0.887	0.892	0.640	0.650	0.914	0.917
AEP	0.853	0.832	0.871	0.856	0.931	0.922
AF	0.866	0.888	0.598	0.642	0.899	0.915
AI	0.915	0.882	0.747	0.680	0.936	0.914
EB	0.731	0.724	0.650	0.645	0.847	0.845
CRE	0.885	0.892	0.744	0.925	0.921	0.925

Note: PhDs: PhD Students; Sup: PhD Supervisor; P: Professionalism; H: Honesty; AEP: Avoiding Violation of Ethical Principles; AF: Academic Freedom; AI: Academic Integrity; EB: Ethical Behavior; CRE: Compliance with Research Ethics.

To test the discriminant validity for each individual construct, the Fornell-Larcker criterion was applied, respectively, Heterotrait-Monotrait (Hair et al., 2010; Henseler et al., 2014) for the two samples. In the case of the Fornell-Larcker criterion, for each latent construct, the value of the average variance extracted must be greater than the correlation coefficient between the construct considered and all other variables. The results are shown in Tables 4a and 4b.

Table No. 4a. Discriminant validity analysis with the Fornell-Larcker criterion (PhD Students)

	EB	P	AEP	AI	AF	H	CRE
EB	0.806						
P	0.454	0.837					
AEP	0.377	0.225	0.933				
AI	0.464	0.462	0.362	0.864			
AF	0.425	0.640	0.251	0.507	0.773		
H	0.529	0.557	0.337	0.593	0.512	0.800	
CRE	0.696	0.459	0.377	0.620	0.462	0.604	0.863

Note: P: Professionalism; H: Honesty; AEP: Avoiding Violation of Ethical Principles; AF: Academic Freedom; AI: Academic Integrity; EB: Ethical Behavior; CRE: Compliance with Research Ethics.

Table No. 4b. Discriminant validity analysis with the Fornell-Larcker criterion (PhD supervisors)

	EB	P	AEP	AI	AF	H	CRE
EB	0.803						
P	0.258	0.863					
AEP	0.195	0.110	0.925				
AI	0.309	0.196	0.390	0.824			
AF	0.409	0.587	0.352	0.451	0.801		
H	0.328	0.267	0.283	0.463	0.410	0.806	
CRE	0.527	0.199	0.484	0.484	0.523	0.245	0.869

Note: P: Professionalism; H: Honesty; AEP: Avoiding Violation of Ethical Principles; AF: Academic Freedom; AI: Academic Integrity; EB: Ethical Behavior; CRE: Compliance with Research Ethics.

In order to avoid similarity between the considered concepts, the discriminant validity test of the Heterotrait-Monotrait criterion was also used. In this situation, the literature (Henseler et al., 2014) recommends that the maximum value be below 0.9. As can be seen in Tables 5a and 5b, all the coefficients are below the maximum recommended threshold, indicating an appropriate situation for the considered constructs.

Table 5a. Discriminant validity analysis with the Heterotrait-Monotrait criterion (PhD Students)

	EB	P	AEP	AI	AF	H	REC
EB							
P	0.562						
AEP	0.467	0.255					
AI	0.549	0.512	0.407				
AF	0.517	0.710	0.280	0.558			
H	0.646	0.619	0.384	0.652	0.573		
REC	0.843	0.515	0.428	0.680	0.512	0.672	

Note: P: Professionalism; H: Honesty; AEP: Avoiding Violation of Ethical Principles; AF: Academic Freedom; AI: Academic Integrity; EB: Ethical Behavior; CRE: Compliance with Research Ethics.

Table 5b. Discriminant validity analysis with the Heterotrait-Monotrait criterion (PhD supervisors)

	EB	P	AEP	AI	AF	H	REC
EB							
P	0.314						
AE	0.249	0.131					
AI	0.372	0.216	0.458				
AF	0.504	0.672	0.404	0.496			
H	0.398	0.275	0.324	0.510	0.449		
REC	0.651	0.226	0.383	0.539	0.580	0.264	

Note: P: Professionalism; H: Honesty; AEP: Avoiding Violation of Ethical Principles; AF: Academic Freedom; AI: Academic Integrity; EB: Ethical Behavior; CRE: Compliance with Research Ethics.

Next, we evaluated the degree of collinearity of the items within the measurement models for the two samples. Thus, it is found that the highest value of the Variance Inflation Factor (VIF) is 4.031 (IA1) in the case of the sample of doctoral students and, respectively, 3.466 (REC2) in the case of the sample of doctoral supervisors. Both values are below the maximum threshold recommended by the literature (Sarstedt et al., 2017), which is 5, which reveals that there are no multicollinearity problems. In the next step, the bootstrap procedure was used, which allowed the analysis of the hypotheses and the relationships between the considered constructs. In total, eight of the nine hypotheses for each individual sample could be accepted based on the analyzed t-statistics.

2.3. Evaluation of the structural models

In the evaluation of the structural models, multicollinearity analysis between the constructs was primarily used. Therefore, it is found that the highest value of the Variance Inflation Factor (VIF) between the constructs is 1.873 (OI→REC) in the case of the sample of doctoral students, respectively, 1.455 (LA→REC) in the case of the doctoral supervisors sample, both

values also being below the maximum acceptable threshold (5) recommended by the literature, which denotes that there is no problem of multicollinearity between the constructs. For both samples, the value of the Square Root Mean Residual (SRMR) is found to be below the maximum threshold of 0.08 recommended as acceptable (Henseler et al., 2016), indicating that the model is appropriate. In fact, the SRMR has the value of 0.065 for the sample of doctoral students, respectively, of 0.073 for the sample of doctoral supervisors.

The predicting power of the two models was also evaluated by means of the R2 coefficient, the values being reproduced in Figure 2a, respectively, 2b. Thus, it is found that in the case of the sample of doctoral students, the predictive power is substantial, Academic Integrity, Academic Freedom, Intellectual Honesty, and Ethical Behavior together explaining 61.6% of Compliance with Ethics by doctoral students ($R^2=0.616$), while the predictive power of the sample of supervisors is a moderate one, given that Academic Integrity, Academic Freedom, Intellectual Honesty, and Ethical Behavior together explain 45.6% of Compliance with Research Ethics ($R^2=0.456$).

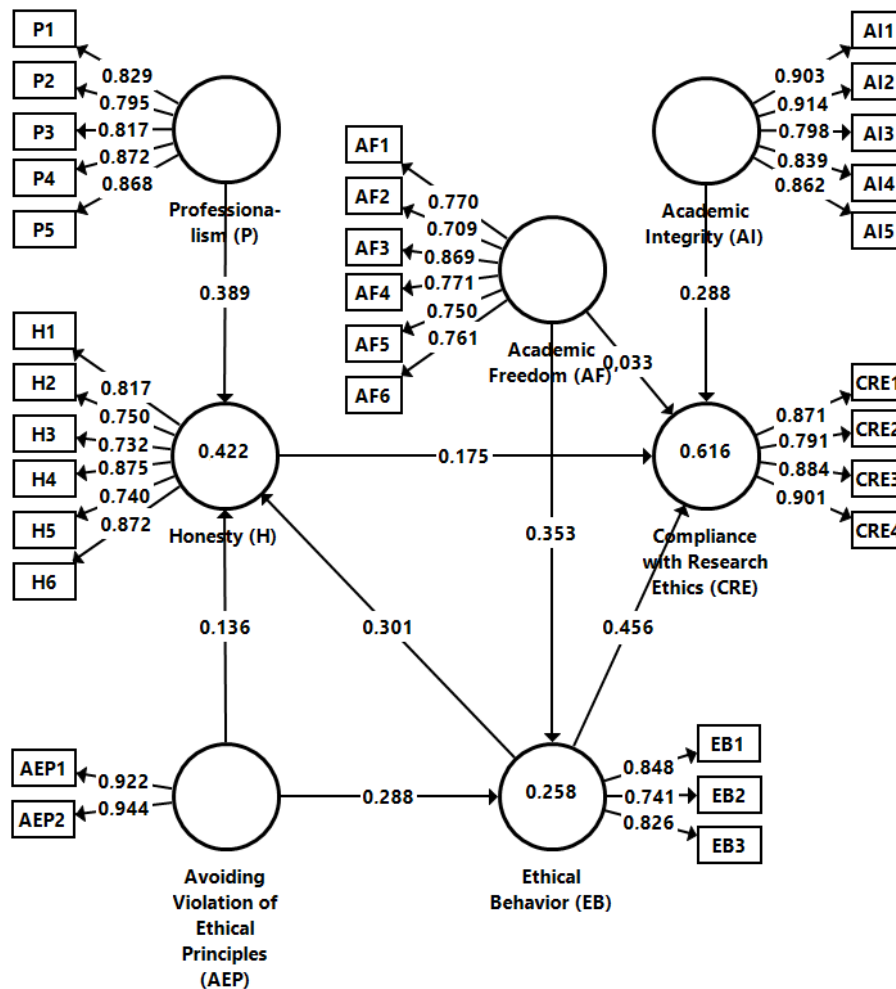


Figure 2a. Structural model (PhD Students)

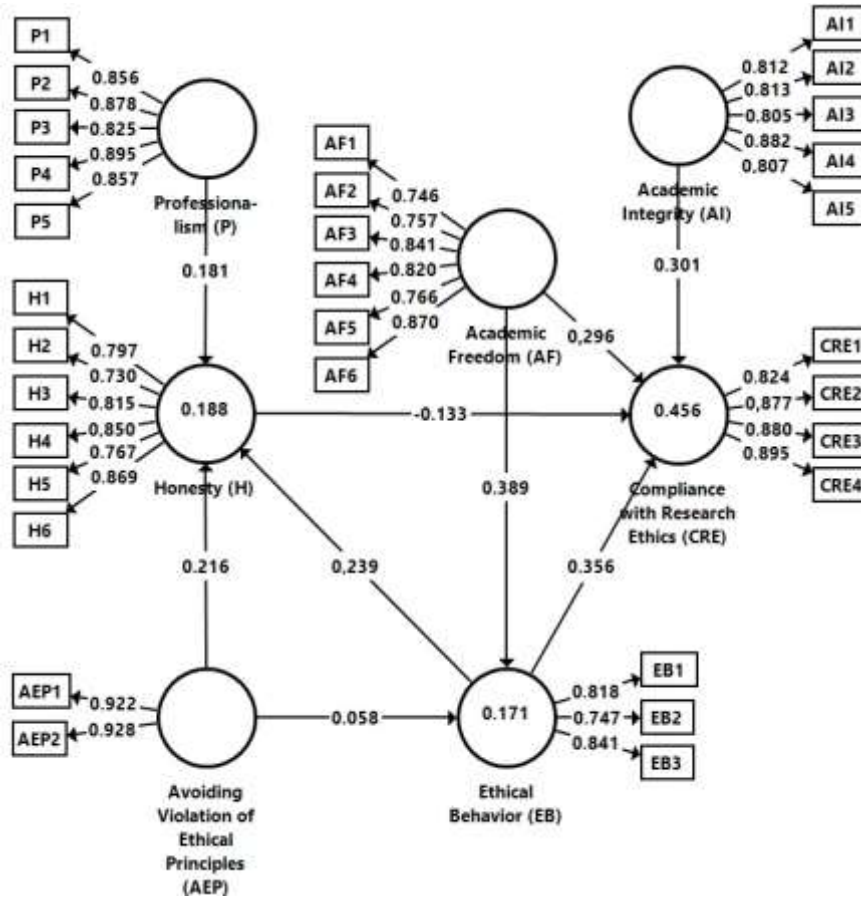


Figure 2b. Structural model (Doctoral supervisors)

3. Results and discussions

The research results are reflected in Table no. 6 where the relationship coefficients of the SEM models (*structural equation modeling*) for the two samples are presented (Path coefficients of the SEM models for the two samples).

Table no. 6. Path coefficients of the SEM models (*structural equation modeling*) for the two samples

Paths	Path Coefficients β	Standard Deviation	t-value	p-value	Hypotheses
PhD Students					
P→H	0.389	0.060	6.447	0.000***	H _{1a} -Confirmed
AEP→H	0.136	0.050	2.698	0.007**	H _{2a} -Confirmed

Paths	Path Coefficients β	Standard Deviation	t-value	p-value	Hypotheses
AEP→EB	0.288	0.074	3.891	0.000***	H _{3a} -Confirmed
EB→H	0.301	0.068	4.402	0.000***	H _{4a} -Confirmed
EB→CRE	0.456	0.067	6.817	0.000***	H _{5a} -Confirmed
H→CRE	0.175	0.070	2.510	0.012*	H _{6a} -Confirmed
AF→EB	0.353	0.068	5.183	0.000***	H _{7a} -Confirmed
AF→CRE	0.033	0.048	0.672	0.502 ^{n.s.}	H _{8a} -Rejected
AI→CRE	0.288	0.093	3.078	0.002**	H _{9a} -Confirmed
PhD Supervisors					
P→H	0.181	0.077	2.339	0.020*	H _{1b} -Confirmed
AEP→H	0.216	0.059	3.692	0.000***	H _{2b} -Confirmed
AEP→EB	0.058	0.082	0.708	0.480 ^{n.s.}	H _{3b} -Rejected
EB→H	0.239	0.077	3.095	0.002**	H _{4b} -Confirmed
EB→CRE	0.356	0.085	4.179	0.000***	H _{5b} -Confirmed
H→CRE	-0.133	0.065	2.510	0.041***	H _{6b} -Partially Confirmed
AF→EB	0.389	0.070	5.542	0.000***	H _{7b} -Confirmed
AF→CRE	0.296	0.088	3.371	0.001***	H _{8b} -Confirmed
AI→CRE	0.301	0.094	3.220	0.001***	H _{9b} -Confirmed

Note: *p<0.05; **p<0.01; ***p<0.001; n.s.=not significant. P: Professionalism; H: Honesty; AEP: Avoiding Violation of Ethical Principles; AF: Academic Freedom; AI: Academic Integrity; EB: Ethical Behavior; CRE: Compliance with Research Ethics.

As can be seen in Table no. 6, professionalism exerts a positive influence on honesty in both the case of doctoral students ($\beta=0.389$; $t\text{-value}=6.447$; $p<0.001$) and doctoral supervisors ($\beta=0.181$; $t\text{-value}=2.339$; $p<0.05$), which allows us to accept H_{1a} and H_{1b}. It is found, however, that the influence of professionalism on honesty is greater for doctoral students than for supervisors, respectively, and that the level of significance is somewhat lower in the case of doctoral supervisors, compared to doctoral students. A possible explanation could be the expression of a certain degree of dissatisfaction on the part of doctoral supervisors with regard to the frequent changes in research evaluation standards, to the rewards received for the results obtained in research, and to the reduced possibility to propose programs academics appropriate for the current situation (there is a package of 12 disciplines considered fundamental established for over 20 years in the faculties with an economic profile!). Doctoral students from Romania are required to attend the ethics and professional deontology courses during the doctoral cycle. It is also likely that the same people followed a similar modus operandi in the master's cycle. Thus, doctoral students have a more acute awareness of the notions of ethics and professional deontology, and they better value this knowledge and its relevance. This finding also appears in Yang (2012), who points out that doctoral students are more knowledgeable about honesty and are therefore less tempted to engage in unethical behavior.

The second hypothesis assumed that avoiding the violation of ethical principles determines honesty. The results reveal that there is a strong and significant influence in the case of doctoral students ($\beta=0.136$; $t\text{-value}=2.698$; $p<0.01$), as well as supervisors ($\beta=0.216$; $t\text{-value}=3.692$; $p<0.001$), indicating that the representatives of both samples positively

value ethical principles, which they apply abundantly in their scientific research behavior, generating intellectual honesty. Thus, H2a and H2b are confirmed.

The third hypothesis (Table No. 5) referred to the fact that avoiding the violation of ethical principles influences the ethical behavior of researchers, whether they are doctoral students or doctoral supervisors. If in the case of doctoral students, this hypothesis H3a can be confirmed ($\beta=0.288$; $t\text{-value}=3.891$; $p<0.001$), the influence being strong and significant, in the case of doctoral supervisors ($\beta=0.058$; $t\text{-value}=0.708$; $p=\text{n.s.}$) hypothesis H3b is rejected. It is obvious that a doctoral supervisor knows the ethical aspects of research and applies them both in his own work and in the relationship with doctoral students. However, there is often a certain lack of openness to the recommendations of colleagues and, above all, a passive attitude toward cases of academic fraud or noncompliance with professional deontology and research ethics. There are cases of public figures with such problems who do not receive firm condemnation from the academic community for flagrant violations of research ethics (especially in the case of doctoral theses). Doctoral supervisors know the unethical aspects and do not have any problems with the recommendations of their colleagues, as they have to coordinate the doctoral students. Doctoral students are very careful about unethical aspects that they do not know, even very well, and, as a result, they attach significant importance to them because they must avoid them during the doctoral course.

The research also focused on investigating the influence of ethical behavior of researchers on honesty i.e., obtaining the consent of the participants in ongoing research, the inclusion of acknowledgements in the work of all those who contributed to its realization, respectively, good knowledge of research methods and assuming the correctness of the research undertaken. The results indicate that in the case of doctoral students ($\beta=0.301$; $t\text{-value}=4.402$; $p<0.001$), as well as doctoral supervisors ($\beta=0.239$; $t\text{-value}=3.092$; $p<0.002$) the influence is relatively high in intensity, the ethical behavior of researchers having a significant influence on honesty. Thus, H4a and H4b are confirmed. The results also reveal the influence of the ethical behavior of doctoral researchers ($\beta=0.456$; $t\text{-value}=6.817$; $p<0.001$), respectively, of doctoral supervising researchers ($\beta=0.356$; $t\text{-value}=4.179$; $p<0.001$) on respect for ethics in research i.e., compliance with the rules of conduct of the doctoral school the researcher is a part of, conducting correct research, correctly citing any ideas of other authors, respectively complying with the ethical standards of the institution. Thus, hypotheses H5a and H5b are confirmed. This idea is also found in the study by Huang et al. (2021), who showed the importance of understanding and respecting ethical responsibilities in research by those involved.

Next, the influence of honesty in observing research ethics was investigated. However, the results are surprising: thus, in the case of doctoral researchers, the influence is found to be low in intensity, but quite strongly significant ($\beta=0.175$; $t\text{-value}=2.510$; $p<0.012$), while in the case of doctoral supervising researchers ($\beta=-0.133$; $t\text{-value}=2.510$; $p<0.041$) the influence is even lower in intensity, but inversely proportional and slightly significant. In other words, honesty has an inverse proportional impact on the respect for ethics in scientific research in the case of doctoral supervisors. This may be due to different standards applied by doctoral supervisors. As can be seen in Table no. 1, doctoral supervisors have very different experience and expertise: some of them have up to five years of experience, while others have more than 20 years. Practically, they obtained the right to coordinate doctorates at different times, when different education laws were in force, respectively, different ethical codes. Thus, the individual doctorate supervisors' own standard is different, each of them relating differently to

honesty, respectively, to the manner of respecting ethics in scientific research. Based on these results, we can consider hypothesis H6a to be fully confirmed, while hypothesis H6b can only be partially confirmed.

The assumption that academic freedom generates the ethical behavior of doctoral researchers ($\beta=0.353$; $t\text{-value}=5.183$; $p<0.000$), respectively of doctoral supervisors ($\beta=0.389$; $t\text{-value}=5.542$; $p<0.000$) could be confirmed, both influences being strong in intensity and significant. Thus, H7a and H7b can be confirmed, which indicates an appropriate ethical behavior of doctoral research, respectively coordinators regarding the dismissal of any co-author who does not respect professional deontology and research ethics, the firm condemnation of academic fraud, respectively, the permanent concern for the dissemination of ethical principles in scientific research. Thus, as Pringle and Woodman (2022) found, academic freedom is a collective right, but also an obligation and responsibility of members of the academic community.

The academic freedom of researchers understood in the form of their right to freely express their scientific opinions, their contribution to the expansion of the frontiers of scientific knowledge for the benefit of society, complete freedom of thought, the choice of the most suitable methods for the ethical solution of any emerging challenges does not exercise any significant impact on compliance with research ethics in the case of doctoral students ($\beta=0.033$; $t\text{-value}=0.672$; $p=n.s.$), which determines the rejection of H8a. Doctoral students have more limited academic freedom. In their activity, they must respect not only the regulations of the doctoral schools, but also the requirements expressed by the doctoral supervisors, who, due to their own experience and expertise, the fact that they became doctoral supervisors at different points in their career, report differently to these aspects, transmitting such knowledge to doctoral students in a very varied way. Moreover, doctoral students face a certain timidity in free ideological expression, both due to the fact that at their level they do not master the theory very well, but also due to the lack of encouragement of such ideological exchanges of ideas at the predoctoral level. Very few students at the bachelor's or master's level participate in student scientific competitions and scientific conferences, so when they reach the doctoral level, they are somewhat inhibited from expressing themselves freely. Regarding the doctoral supervisors ($\beta=0.296$; $t\text{-value}=3.371$; $p<0.001$), however, the relatively strong and very significant influence of academic freedom in the observance of ethics in research can be found, a sign that the problems that occur in the case of doctoral students do not appear and do not manifest themselves in the activity of doctoral supervisors. The degree of freedom of professors in conducting research is greater than that of doctoral students. Thus, H8b is confirmed.

Regarding the influence of academic integrity on the compliance with research ethics, the results indicate a relatively strong and significant relationship both in the case of doctoral students ($\beta=0.288$; $t\text{-value}=3.078$; $p<0.002$), as well as for doctoral supervisors ($\beta=0.301$; $t\text{-value}=3.220$; $p<0.001$), which allows us to accept H9a and H9b. Doctoral students assume academic freedom to a lesser extent than experienced researchers. Specifically, doctoral students have much greater constraints from the perspective of the research plan, topic, and research program, than doctoral supervisors, who are experienced researchers. Due to their scientific experience in an early phase, but also to the fact that ideational expression is not necessarily encouraged at the predoctoral level, it is plausible that doctoral students do not perceive very well the connection between academic freedom and the respect of ethics in research. For doctoral supervisors, there is objectively more substantial academic freedom.

Therefore, research ethics and academic freedom are perceived to be positively correlated because more freedom also requires more personal responsibility.

Conclusions

The paper presents relevant information on specific aspects of ethics and integrity in the economic research activity in doctoral schools, facilitating the establishment of the level of perception of the importance of the application of ethical principles in scientific research activity by doctoral students and doctoral supervisors. At the same time, the creation of a conceptual model deduced from the specialized literature regarding the precursors of ethical compliance in scientific research was pursued. The derivation of such a conceptual model and its application among doctoral students and doctoral supervisors in the Romanian economic sciences represent the distinctive elements of the paper. Thus, this paper can be useful both to researchers, graduate students, and doctoral students whose dissertation/doctorate topics include such analyses, but especially to university management and doctoral schools, called to make doctoral students and their members aware of and responsible for the respect of ethics in scientific research in accordance with the regulations in force, respectively, with the norms assumed at the institutional level.

From a managerial perspective, the paper makes it possible that, starting precisely from the identification of the factors with the greatest influence on ethics and integrity in economic research, universities, respectively, doctoral schools, adopt measures to optimize the existing ethical infrastructure at the level doctoral and postdoctoral regarding, for example, deontology codes and the responsibilities of ethics commissions, but also to watch over the application of ethical principles by all researchers of the higher education institution. Universities and doctoral schools are responsible for periodically organizing training courses, workshops, conferences, etc., on topics of ethics and academic integrity, intended not only for doctoral students, but also for doctoral supervisors, who sometimes need to update their knowledge regarding institutionally adopted ethical standards. Of course, ideally, all these aspects must be found in an institutional strategy regarding the respect of ethics in scientific research, a document that must be revised and supplemented periodically according to the identified good practices, the situations that can potentially represent a violation of the conduct, respectively, of the proven concrete cases that generated the violation of the regulations and norms in force. Only by implementing such an ethical strategy at the institutional level can universities become integrated organizations, with doctoral schools that own and implement functional mechanisms for training, preventing, verifying, and punishing any violations of deontology and ethics in scientific research. The predictive power determined for the two models – 61.6% in the case of PhD students and 45.6% in the case of doctoral supervisors – suggests that there are aspects with potentially significant influence that could not be included in the model. In this sense, it would be interesting to explore the effect on ethics of the conditions in which the research is carried out, with possible reference to resources (time and money), incentives, or organization.

A limitation of the paper is represented by the fact that the research referred only to the doctoral schools of the Universitaria Consortium (only nine universities in Romania). As a result, future research will be able to increase the samples, taking into account more doctoral students, respectively, doctoral supervisors from doctoral schools of economic sciences in Romania, respectively, from related fields, such as, for example, the field of social sciences. Comparative transnational studies could also be very interesting, but also those that point out the way in which researchers, depending on their experience in

scientific research (research assistant, researcher, senior researcher, etc.) relate to the ethics and integrity of scientific research, respectively, to the extent to which they adopt and respect the ethical principles and norms in the ongoing research.

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