



Bx. № 2220-1226/12.10.2022 by Prof. Dr. Julian Andreev Vasilev

## REVIEW

from University of Economics – Varna

Professor at 4.6 "Informatics and Computer Science", validated in the register of academic staff of THE NATIONAL ACADEMY of Sciences "Habilitated persons with science indicators";

Member of a scientific jury for holding an academic position "Professor" in an announced competition from the University of Economics – Varna

### I. Reason for writing the review

Order of the Rector of The University of Economics Varna RD 06-156/20.09.2022 determining the composition of the scientific jury; held the first meeting of the scientific jury on 28.09.2022.

### II. Competition data

The competition is announced in the field of higher education 4 "Natural Sciences, Mathematics and Informatics", professional field 4.6 "Informatics and Computer Science", scientific specialty "Informatics"; for the needs of the Faculty of Informatics and the Department of Informatics at The University of Economics Varna. An advertisement is published in SG 57/22.07.2022.

### III. Candidate for the competition

The only candidate in the contest is Assoc. Prof. Dr. Silvia Stoyanova Parusheva. She holds a certificate of scientific title "Associate Professor" from the UEV (26282/25.05.2010). In addition to working at FIBANK, she has participated in scientific juries, journal editorial boards, program and organizational committees at conferences.

The candidate, Assoc. prof. Parusheva covers the minimum national and requirements (MNR) described in the EDIP and the minimum university requirements (MUR) for "professor" in SF 4.6. On certain criteria, the applicant's points exceed the minimum.



**Table 1.**

**MNR for "Professor " in SF 4.6 according to ZRASRB and points of Assoc. Prof. Parusheva**

Indicator	According to ZRASRB	Dots of Assoc. prof. Parusheva
A	50	50
B	-	-
V	100	100
G	200	863
D	100	560
E	100	352

**Table 2.**

**Minimum University Requirements (MUR)**

№	Indicators	MUR for "professor"	Dots of Assoc. prof. Parusheva
1.	Scientific papers at conferences	60	104
2.	Scientific articles and studies	115	124
3.	Publications in Scopus and/or Web of Science	30	324
4.	Citations in Scopus and/or Web of Science	15	1050
5.	Defended PhD students	40	40
6.	Research projects (participation and/or management)	15	230

## IV. Meaningful feature of the works submitted

In the competition for "professor" Assoc. Prof. Parusheva participates with **66 publications**, including 2 monographs, 4 studies, 16 articles, 31 papers at conferences, 12 textbooks and teaching aids; 1 publication – in the "other" section.



**Table 3.**

**SUMMARY TABLE FOR THE PUBLICATIONS SUBMITTED**

№	Type of publications	Independent		With co-authors		Total	
		Count	Pages	Count	Pages	Count	Pages
1.	Monographs	1	169	1	45	2	214
2.	Studies	2	56	2	33	4	89
3.	Scientific articles	6	101	10	87	16	188
4.	Scientific papers at conferences	6	46	25	103	31	149
5.	Textbooks and teaching aids	1	102	11	801	12	903
6.	Other publications	1	4	-		1	4
	<b>Total:</b>	<b>17</b>	<b>477</b>	<b>49</b>	<b>1069</b>	<b>66</b>	<b>1547</b>

**Table 4.**

**SUMMARY TABLE ON THE VOLUME AND TYPE OF PRODUCTION**

№	Type of publications	To participate in the competition for professor		Total <sup>1</sup>	
		Count	Pages	Count	Pages
1.	Monographs	2	214	3	273
2.	Studies	4	89	6	153
3.	Scientific articles	16	188	26	335
4.	Scientific papers at conferences	31	149	40	227
5.	Textbooks and teaching aids	12	903	17	1274
6.	Other publications	1	4	1	4
	<b>Total:</b>	<b>66</b>	<b>1547</b>	<b>93</b>	<b>2266</b>

<sup>1</sup> In Column Total all publications of Assoc. prof. Silvia Parusheva – on the subject of the dissertation, in the competition for "Associate Professor" and in the competition for "Professor".



According to the requirements of the ZRASRB, the PPZRASRB and the Rules for Development of Academic Staff in The University of Economics Varna, the candidate for the academic position "Professor" must meet the following conditions.

- To have "doctor" degree. *Assoc. prof. Parusheva meets this condition. The theme of the dissertation is "Economic study of the average yield of short-term government securities in the Republic of Bulgaria (problems, analyses and models)".*
- To have academic degree "associate professor" for at least 2 years. *The applicant meets this condition. Assoc. prof. Parusheva has held the academic position "Associate Professor" since 2010 (Number and date of appointment: RD-17-1389 / 11.06.2010).*
- To present a published monographic work. *The candidate has published an independent monograph "Parusheva, S. (2021). Authentication methods for protecting individual users of internet banking. Monograph Library "Prof. Dr.Sc.(Econ.) Tsani Kalyandzhiev", Cn. 71. Varna: Science and Economics, ISSN 978-954-21-1068-2".*
- To meet the minimal national requirements (MNR) for acad. Position "Professor". *The candidate covers the MNR.*
- To meet the minimal university requirements (MUR). *The candidate covers the MUR.*
- No established plagiarism has been found. *There has been no established plagiarism.*
- To have at least one PhD student with successful defense. *Assoc. prof. Parusheva has a PhD student with successful defense (Dr. Daniela Pencheva).*

The monographic (habilitation) work with which the competition is participated (*Parusheva, S. (2021). Methods of authentication for the protection of individual users of internet banking. Tsani Kalyandzhiev*", Cn. 71. Varna: Science and Economics) is an independent monographic work; it is discussed in the primary unit (Department of Informatics), reviewed by two habilitated persons, is published in a specialized scientific publishing house, has an ISBN,



has deployed content; has a comprehensive bibliography, does not repeat any known knowledge; a significant scientific problem at a high scientific level is discussed; it is **169 pages**.

She has a profile in Scopus (<https://www.scopus.com/authid/detail.uri?authorId=57194213589>). There are **20 publications in Scopus, 78 citations, h-index: 5**.

She has a WoS account (link: <https://www.webofscience.com/wos/author/record/1185743>). WoS has **15 publications, 45 quotes, h-index: 4**.

She has profiles in Scholar Google, ORCID (link: <https://orcid.org/0000-0002-7050-3514>), RePEc, CEEOL and Research Gate.

All publications of Assoc. prof. Parusheva are entered in the Register publications of The University of Varna (link: <https://publications.ue-varna.bg/list-author/6LVW>).

The publications taking part in the competition are not used to hold a previous academic position.

## V. Study work. Project work. Mobility and

At "Bachelor" degree assoc. prof. Parusheva has conducted classes in the following disciplines: Informatics, Basics of Information Systems, Operating Systems, UNIX Operating Systems, Planning and Management of Information Systems Security, Cloud Technologies, Academic Research, E-Business (in English).

At the Master's degree assoc. prof. Parusheva has held classes in the following disciplines: Electronic Business, Basics of Information Systems, Operating Systems, Cybersecurity, E-Finance (in English).

In recent years, there has been a full audience workload.

Assoc. prof. Parusheva participated in the preparation of several curricula.

In the period 2010-2022 assoc. prof. Parusheva participated in **12 projects**.

She has participated in Erasmus outgoing mobility. She has participated in the welcome of fellow incoming mobility teachers.

Assoc. prof. Parusheva is director of the Centre for E-learning and Distance Learning (CEDO) in Varna. In the most difficult moments of COVID waves, with repeated transition from attendance to online training and vice versa, the CEDO team did well.



## VI. Contributions, citations

The following contributions are highlighted in the habilitation work of the competition:

1. An empirical study related to the usability of online banking was conducted.
2. A methodology has been developed for the selection and implementation of a multi-factor authentication scheme in e-banking.
3. A survey of the state of authentication methods that banks in Bulgaria apply to individual users of online banking has been conducted.

Other publications may highlight additional contributing points related to:

1. Detection of card fraud.
2. Study the social media app in business.
3. Digitization strategies.
4. User experience in e-learning platforms.

Assoc. prof. Parusheva has a **total of 261** citations. The reference to the citations is made correctly – auto citations are not included.

## VII. Critical notes, questions, recommendations

Assoc. prof. Parusheva has one successfully defended PhD student – Dr. Daniela Pencheva. I recommend Assoc. prof. Parusheva to continue working with PhD students. To include PhD students and students in their work on scientific projects.

I recommend continuing the participation in Erasmus mobility; participation in projects and projects' leadership.

I recommend taking part in incoming Erasmus courses.

As director of CEDO, continue to work in a team with the colleagues from CEDO.

The professional knowledge of Assoc. prof. Parusheva in statistics, language skills in German and English and her work in a bank prior to her academic career are a serious basis for her further work at The University of Economics Varna. Technological solutions to protect online banking from



hacking attacks, to prevent card fraud crystallize in significant scientific publications and in elements of curricula.

## VIII. Conclusion

The careful examination of all documents and publications of the candidate **Assoc. Prof. Dr. Silvia Parusheva**, submitted for participation in the competition for academic position "Professor" in 4.6, show that all the requirements of the ZRASRB, the PP ZRASRB and the Rules for Development of Academic Staff in The University of Economics Varna have been met. The applicant meets the minimum national and university requirements for taking up an academic position "**professor**" in 4.6 at the time of the announcement of the competition.

I give my positive opinion on the readiness of the candidate **Silvia Parusheva** to take the academic position "Professor" of the University of Economics Varna in professional field 4.6 "Informatics and Computer Science", scientific specialty "Informatics".

12 October 2022  
Varna

With respect:

Заличена информация съгласно  
ЗЗЛД и регламент (ЕС) 2016/ 679

/Julian Vasilev/



ИКОНОМИЧЕСКИ УНИВЕРСИТЕТ - ВАРНА

Вх. № 2820-1301/28.10.2022

## REVIEW

**on a competition for professor** in the field of higher education 4. Natural sciences, mathematics and informatics; professional field 4.6 Informatics and Computer Science; scientific specialty "Informatics"; announced in State Gazette issue 57 / 22.07.2022 for the needs of the University of Economics – Varna, Department of Informatics with single candidate Assoc. Prof. Dr. Silvia Stoyanova Parusheva.

**Reviewer: Prof. Dr. Vladimir Sulov,**

from the University of Economics – Varna,

member of the scientific jury of the competition according to order RD 06-156 / 20.09.2022 of the Vice-Rector of the University of Economics – Varna and elected as a reviewer at a jury meeting held on 29.09.2022.

### I. Personal characteristics of the applicant

The candidate in the competition Silvia Stoyanova Parusheva was born

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Between 1989 and 2001 she worked in various positions in the Scientific and Manufacturing Enterprise in Transport Cybernetics and Technology, the Scientific Center "Documentless Information Systems" at the University of Economics – Varna and the First Investment Bank. In part of the same period she worked on a PhD thesis and in 2001 defended her doctoral





thesis on "Iconometric study of the average yield of short-term government securities in the Republic of Bulgaria (Problems, analyses and models)" in the scientific specialty "Statistics and Demography".

In 2001 she won a competition for associate professor at the same department and university.

## **II. Research and contributions of the applicant**

In the competition for Professor Assoc. Prof. Dr. Silvia Parusheva participates with a total of 53 scientific publications, including:

- 1 single author monograph (habilitating work) and participation in 1 collective;
- 4 studies, of which 2 single authored;
- 16 articles, of which 6 single authored;
- 31 papers, of which 6 single authored.

In addition to scientific publications, the candidate has participated in 12 textbooks and teaching aids and 1 other publication.

*The main monographic work of Assoc. Prof. Dr. Silvia Parusheva "Authentication methods for the protection of individual users of internet banking" has a volume of 156 (printed) pages (169 in standard pages as indicated by the applicant; below, the review uses the number of printed pages in the assessment of the monograph) and includes an introduction, 5 chapters, a conclusion, a list of references with 247 sources and a list of abbreviations (at the beginning).*



In general, the work is dedicated to threats to the security of computer systems, in particular banks and internet banking, and the possibilities to ensure safe and reliable authentication in this activity.

The author's thesis is that "banking institutions can improve the security of online banking by applying more reliable authentication methods to individual users in order to achieve a higher level of their protection".

The goal of the monograph is "to offer methodology and methodological notes for the selection and implementation of schemes for reliable multifactor authentication of online banking users. The methodology is based on research and analysis of the practices of the banking institutions on the authentication methods applied in Bulgaria and together with its complementary methodological notes and recommendations aims to contribute to improving the security of the electronic banking service."

I accept that the thesis statement and the goal are appropriate for such work.

Five tasks follow, which I also accept and which are largely consistent with the chapters of the monograph.

The subject of the study is "internet banking offered by banks to individual clients" and the subject matter – "the authentication approaches applied to them by financial institutions working on the Bulgarian market, as well as the possibilities for improving them".

The first chapter is entitled "Internet Banking – the Modern Digital Nature of Banking Services" and is 18 pages. The essence of and the trend towards e-banking, in particular internet banking, is revealed.



Chapter 2 is entitled "Threats to internet banking users" and is 27 pages. A number of threats that can be said to be threats to internet security in general, not only for banking, including Trojan horses, phishing, vishing, farming, spyware, rootkit, "man in the middle", "man in the browser", etc, are discussed.

Chapter 3 is entitled "Authentication of internet banking users" and is 26 pages. The essence of authentication, methods for its implementation in internet banking, including innovative ones, comparison of methods, application of two-factor and multifactor authentication are discussed.

Chapter 4 is entitled "Study of the State of Authentication of Individual Users of Internet Banking in Bulgaria" and is 19 pages. As its name suggests, it elaborates on an author's survey carried out as of June 2019 on what banks offer as a second factor for authentication, as well as various other features in relation to authentication.

Chapter 5 is entitled "Opportunities to improve authentication schemes applied by banks to consumers of online banking" and is 26 pages. The author proposes a methodology for choosing and implementing by banks a multifactor authentication scheme in 7 stages. Methodological issues, specifics of the implementation of each of the stages and recommendations to banks on the authentication schemes used are commented.

The work's conclusion sums it up, outlines future opportunities and points to 4 contributing points.

*Main positive moments of the monograph:*

The theme of the monograph, in my opinion, is relevant in view of the increasing use and risks to internet banking.

The proposed material is correct and appropriately written.



A significant number of sources have been used.

The author has indicated 4 contributions, I would summarize and somewhat combine the achievements in 2 directions:

1. Surveys of internet banking in Bulgaria and in particular the authentication methods offered by banks, as well as the attitudes of young people towards online banking, have been carried out.

2. Methodology, methodological notes and recommendations to banks are proposed when choosing methods for authentication and security improvement, including scenario – approbation of the methodology.

*Critical notes to the monograph:*

Two critical notes to the monograph could also be made: it would have been better if it had more material with the author's ideas at the expense of research, and if it had discussed issues related to "pure" informatics and information technology rather than organizational and applied aspects.

*The other scientific* publications of the author concern diverse themes, which can be summarized in the following main topics (everywhere below in the review I have used the general numbering of publications as given in the list for participation in the competition):

- security in online banking and electronic payments (publications No1, No8, No9, No10, No27, No29, No33, No37, No40);
- relations between the banks and their clients, including the use of social media, as well as other topics concerning the banking and financial sectors (publications No3, No4, No7, No11, No12, No19, No25, No26, No28, No46);



- business (especially construction) digitalization (publications No2, No5, No18, No21, No22, No23, No41, No41, No42, No43, No44, No45, No47, No48, No49, No50, No51);
- problems of e-learning, including the use of social networks (publications No6, No13, No15, No16, No34, No35, No39, No53) and others.

23 of the publications are indexed in Scopus and/or Web of Science.

The other scientific publications are indexed in other databases.

The publications have been cited a total of 261 times, of which 70 times in Scopus and/or Web of Science, which is an excellent achievement.

Assoc. prof. Parusheva has or is currently supervising a total of 5 PhD students, including one successfully graduated/defended PhD student. She is a member of several editorial boards and program and organizational committees of scientific events.

*The following main contributions in the publications of Assoc. Prof. Silvia Parusheva (according to the reference submitted by her, some of them already referred to in the main monograph discussion) may be indicated:*

1. Surveys of internet banking in Bulgaria and in particular the authentication methods offered by banks, as well as the attitudes of young people towards online banking, have been carried out.

2. Methodology, methodological notes and recommendations to banks are proposed when choosing methods for authentication and security improvement, including scenario – approbation of the methodology.

3. Trends and specifics in card fraud have been investigated and an approach to their prevention with the use of smart methods has been proposed.



4. Models and suggestions for the use of social media in business and education have been brought up.

5. Proposals have been made to improve the activity of companies in the field of construction and real estate with the help of digitalization.

6. Contributions have also been made in the field of education, including e-learning.

### **III. Teaching and other activities of the applicant**

Assos. Prof. Dr. Silvia Parusheva has 21 years of experience as a regular university lecturer, incl. 12 as an associate professor. For each of the academic years she has had over 400 hours of auditorium employment equated in exercises.

Over the years, she has read numerous disciplines such as Informatics, Cloud Technologies, Information Systems Security Planning and Management, Basics of Information Systems, E-Business (in English), Academic Research, Information and Communication Technologies in the Financial Sector, E-business Strategies, Financial Software, Statistical Databases, Modern Information Communications, Internet Business Applications, Operating Systems, Operating Systems UNIX, Cybersecurity, E-Business, E-Finance (in English), Information Systems and E-business.

She has participated in 12 textbooks and teaching aids, as well as numerous electronic learning materials, participated in the development of about 30 curricula in different subjects, including PhD subjects.

Assos. Prof. Silvia Parusheva participates in 12 scientific projects and manages three of them.



#### **IV. Critical notes and recommendations**

I have already expressed my critical note aimed at the main monographic work, which I will expand and point as a recommendation to the previous and future activities of the candidate: I recommend to Assoc. Prof. Silvia Parusheva to focus more on technological and algorithmic problems that are more closely related to informatics and computer science – the field in which the current competition is.

#### **V. Assessment of compliance and conclusion**

In conclusion, I can summarize the compliance of the achievements of the applicant with the mandatory requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the application of the Law on The Development of the Academic Staff in the Republic of Bulgaria, including the minimum national requirements, and the Regulations for the Development of the Academic Staff at the University of Economics – Varna.

With regard to the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and its Implementing Regulations:

The applicant holds the educational and scientific degree "Doctor".

The candidate has held the academic position associate professor for more than 2 academic years.

The candidate has presented a monographic work, as well as other publications in specialized scientific publications.



The applicant meets and exceeds the minimum national requirements for the academic position "Professor" in the professional field 4.6 in respect of all categories and in total.

No plagiarism has been established.

With regard to the additional requirements in the Regulations for the Development of the Academic Staff at the University of Economics – Varna:

The main monographic work was published in a specialized scientific publishing house and was discussed in advance in a specialized primary unit (department) and was reviewed by two habilitated individuals.

The applicant also fulfils the other minimum quantitative requirements for publications and citations.

The candidate participated in at least one research project and supervised a successful PhD student.

In view of the above, I believe that the applicant meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Application of the Law on The Development of the Academic Staff in the Republic of Bulgaria and the Regulations at the University of Economics – Varna . On the basis of this, and also on the basis of all the actual achievements of the candidate, I recommend to the esteemed jury to award the academic position "Professor" in the professional field 4.6 Informatics and Computer Science to Assoc. Prof. Dr. Silvia Stoyanova Parusheva.

27.10.2022

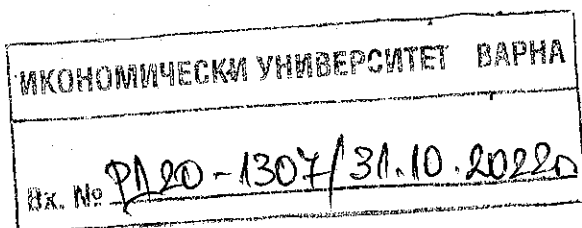
Varna

Reviewer:

Заличена информация съгласно  
ЗЗЛД и регламент (ЕС) 2016/ 679

(Prof. Dr. Vladimir Sulov)





## REVIEW

by Prof. D.Sc. Ivan Ganchev Garvanov

University of Library Studies and Information Technology,  
member of a scientific jury according to the Order of the Rector of The University  
of Varna No RD 06-156/20.09.2022 and Decision of the Scientific Jury of  
27.09.2022, by competition for academic position "Professor", field of higher  
education 4. "Natural Sciences, Mathematics and Informatics", professional field  
4.6 "Informatics and Computer Science", published in State Gazette No.

57/22.07.2022

The only candidate in the contest is: **Associate professor Silvia Stoyanova  
Parusheva, PhD**

### 1. General information

The opinion was prepared by Prof. Ivan Ganchev Garvanov, professional  
field 4.6. "Informatics and Computer Science", according to the Order of the  
Rector of The University of Varna No RD 06-156/20.09.2022, Decision of the  
Scientific Jury of 27.09.2022, Law on the Development of Academic Staff in the  
Republic of Bulgaria, Regulations for Implementation of the Law on the  
Development of Academic Staff in the Republic of Bulgaria, Regulations for  
Development of Academic Staff in The University of Varna.

### 2. Competition data

The competition for the academic position "Professor" in the field of higher  
education 4. "Natural Sciences, Mathematics and Informatics", professional field

4.6. "Informatics and Computer Science", scientific specialty "Informatics", was announced in State Gazette, issue No 57/22.07.2022 for the needs of the Department of Informatics.



### **3. Contest Candidate**

The only candidate in the contest is: associate professor Dr. Silvia Stoyanova Parusheva. The candidate works at the University of Economics - Varna and fulfills the minimum national requirements for acquiring the academic position "Professor".

### **4. Personal characteristics of the candidate**

The candidate completed her secondary education at the First Language High School - Varna in 1984. In 1989, she completed her higher education at the University of Economics - Varna with a Master's degree, economist in Socio-Economic Information. In 2001, he obtained the educational and scientific degree "doctor" in the scientific specialty "Statistics and demography", with the thesis topic "Econometric study of the average yield of short-term government securities in the Republic of Bulgaria (Problems, analyzes and models)". In the period 1989 - 1991, he worked at the Research and Production Enterprise for Transport Cybernetics and Technologies as an application systems programmer. From 1991 to 1994, he was a programmer of application systems at the Scientific Center for "Documentless Information Systems" at the University of Economics - Varna.

For several months in 2001, he worked as a general banking operations specialist at the First Investment Bank - Varna. After obtaining the educational and scientific degree "Doctor" in 2001, the candidate in the competition was appointed to the position of Chief Assistant in the Department of "Informatics" at the University of Economics - Varna, and from 2010 until now she is an Associate Professor in direction 4.6 "Informatics and Computer Sciences" at the same university.

From the candidate's CV, it can be seen that she has consistently

accumulated a lot of practical skills and theoretical knowledge over time. I believe that the candidate is a well-rounded professional, teacher and researcher with enviable knowledge and skills and that she should continue to work in the future with this enthusiasm.

#### **5. Quantitative and meaningful characteristic of the scientific papers submitted after the last procedure**

The candidate Associate Professor Dr. Silvia Parusheva participated in the competition for the academic position of "professor" with 66 scientific works, as follows: one monograph; five studios; sixteen scientific articles; thirty one scientific papers; twelve textbooks and study aids; one other post. The total number of pages of the papers submitted for review is 1547.

The attached scientific papers were not used for the acquisition of the educational and scientific degree "doctor" and for the occupation of the academic position "associate professor" and are in the subject of the competition.

The monographic work "Methods for authentication for the protection of individual Internet banking users" has a volume of 169 pages and meets the requirements of Art. University - Varna, since the published monographic work does not repeat publications for the acquisition of the educational and scientific degree "doctor", it was published in a specialized scientific publishing house, was discussed in a specialized primary unit in the sense of § 1, item 6 of the Law on the Development of Academic Staff in the Republic of Bulgaria and was peer-reviewed by two qualified persons.

The monographic work is an in-depth scientific study examining the problem of authentication of individual users of Internet banking, which is of primary importance from the point of view of the security of the electronic financial service. Methodology and methodological notes for reliable authentication of online banking users are proposed. The methodology is based on research and analysis of the practices of banking institutions regarding authentication methods applied in our country and aims to contribute to improving the security of

electronic banking services.

The fulfillment of the minimum national requirements for the groups of indicators for the academic position "professor" is as follows:

For group "A", the candidate submitted a certified copy of the educational and scientific degree "Doctor" diploma issued by the VAK on 13.06.2001, with number 27317.

For group "B", the candidate presented a monographic work - 100 points.

For group "G", the sum of the indicators from 5 to 10 forms a total of 863 points out of the required 200 points. These points are obtained from 23 publications indexed in Scopus and WoS and one collective monograph.

For group "D", the sum of points is 560 with a required 100 points. These points are obtained from 70 citations of 14 publications of the candidate.

For group "E", the sum of the indicators from 12 to 20 forms a total of 352.6 points out of the required 100 points. These points are obtained from the supervision of a successfully defended doctoral student, participation in scientific and educational projects, including national and international ones. Published textbooks and study aids.

From the analysis made in this way, it was established that the evidence presented by Assoc. prof, Dr. Silvia Parusheva significantly exceeds the specified minimum national requirements set in the Law on the Development of the Academic Staff in the Republic of Bulgaria, Implementing Regulations of the Law on the Development of the Academic Staff in the Republic of Bulgaria, as well as the internal requirements set in the Regulations on the Development of the Academic Staff in the University of Varna (art. 77, items 3, 4, 5 and 6 in connection with Art. 86) for occupying the academic position "professor" in professional field 4.6. "Informatics and computer science".

When a check was made on 25.10.2022 about the scientometric indicators of the candidate in Scopus, Web of Science and Google Scholar, the following was found:

The number of publications in Scopus is 20, the number of citations is 79

and the h-index is 5.

The number of publications in WoS is 15, the number of citations is 48 and the h-index is 4.

The number of citations in Google Scholar is 240 and the h-index is 9.

## **6. Quantitative and qualitative assessment of the teaching work**

Assoc. Prof. Parusheva is a long-time teacher at EU - Varna, having held the academic positions of "assistant" and "associate professor" for a total of over 20 years. 77, item 2 in connection with Art. 86 of the Regulations for the Development of the Academic Staff at the University of Economics - Varna. Her teaching competence fully meets the announced competition.

Assoc. Prof. Parusheva has developed and delivered lecture courses a degree "Bachelor", degree "Master" and educational and scientific degree "Doctor" as follows:

For degree "Bachelor": Informatics, Cloud technologies, Security planning and management in information systems, Fundamentals of information systems, E-business (English language), Academic studies, Information and communication technologies in the financial sector, E-business strategies, Financial Software, Statistical Databases, Modern Information Communications, Internet Business Applications, UNIX Operating Systems, Operating Systems.

For Master's degree: Cyber Security, Electronic Business, Fundamentals of Information Systems, Cloud Technologies, E-Finance (English), E-Business Part 2, E-Business Part 2 (English), Information Systems and E-Business.

For educational and scientific degree "Doctor": E-business and digital markets, Information security, Network infrastructures, Internet and office applications in scientific research.

She participated in Erasmus+ training, Fontys University of Applied Sciences, the Netherlands (May 2012); Ural Federal University, Russia (2016), University College Algebra, Croatia (April 2019)

He actively participates in 12 scientific research projects, he is the head of 3

of them.

She was the academic supervisor of 11 bachelor's graduates and 15 master's graduates. She has supervised five doctoral students, one of whom has successfully defended the educational and scientific degree "Doctor", one is in the process of training, two have been dismissed with the right to defend, and one has dropped out.

From the attached documents for the competition, it can be seen that Associate Professor Parusheva is extremely active and takes part in teaching and research work, as well as in many administrative activities.

### **7. Identification of scientific contributions**

I believe that the publications submitted by the candidate for review in the competition are for the most part her personal work, despite the co-authorship of some of them. The presence of more than one author in the publications shows that she manages to work well in a team and obtain high scientific results, which is confirmed by the places of their publication.

The contributions presented by Assoc. prof Dr. Silvia Parusheva are of a scientific and scientific-applied nature. I accept the candidate's contributions as significant, real and enriching existing theory and practice.

I defined the contributions as:

Methodology and methodological notes for reliable authentication of online banking users are proposed. (monograph №1)

Analyzing the possibilities for the application of social media in business (banking) and in the field of smart city management. Four main models for implementing social media banking have been formulated. (studies №3, №4; articles №11, №17; reports №28, №36).

Basic regularities in the use of social media in education have been revealed. Important trends, opportunities and limitations for the application of social media in higher education institutions have been identified (articles №13, №16; reports №34, №35).

A methodology for implementing a digitization project and developing digitization strategies in the field of construction and real estate is proposed. (monograph №2; articles №18, №21, №22; reports №42, №45, №47, №49, №50).

Trends and regularities in card fraud have been studied and an intelligent approach to their prevention with the use of intelligent methods has been proposed (articles №9, №10; reports №29, №33).

Approaches are proposed for performing comparative analysis in the study of user experience, experience and perception of the user interface of e-learning platforms and tools Microsoft Teams, Google Meet and Moodle by students. (study №6; report №53).

An approach for developing intelligent learning systems (Smart learning Systems - SLS) is proposed using knowledge engineering as a subfield of artificial intelligence (№15).

A conceptual business model of an intelligent system, respectively a module for managing orders to suppliers with included components, which are visually represented using the UML and BPML standards, has been developed (studio №5; report №51).

In order to improve the quality of student education and provide it with educational materials, a number of book and online textbooks, study aids, manuals and support materials have been developed and published, which can be used in the following disciplines: Electronic Business (№14, №57, №59, №60, №64); Fundamentals of information systems (№62); Information and communication technologies in the financial sector (№61, №7, №25, №26); Informatics (№54, №55, №56, №58, №63, №65).

## **8. Critical notes and recommendations**

I take the liberty of recommending Assoc. Prof. Dr. Silvia Parusheva to be the supervisor of more doctoral students in order to pass on her rich scientific and teaching experience to the next generation of Bulgarian teachers and researchers.

## 9. Conclusion

Having familiarized myself with the materials and scientific works presented in the competition and based on the analysis of their significance and the scientific and scientific-applied contributions contained in them, I confirm that the scientific achievements meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Implementing Regulations of the Law on the Development of the Academic Staff in the Republic of Bulgaria, as well as the internal requirements set in the Regulations on the Development of the Academic Staff in the University of Varna. Assoc. Prof. Dr. Silvia Stoyanova Parusheva meets the minimum national requirements in the professional direction and no plagiarism has been found in the scientific works submitted for the competition.

All this gives me reason to give my positive assessment of the candidacy of Assoc. Dr. Silvia Stoyanova Parusheva for the academic position of "professor" in professional field 4.6. "Informatics and computer science".

Date: 30.10.2022

Member of the scientific jury

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